

I. INTRODUCTION

In the early days of the environmental movement, big business was routinely depicted as a major cause of environmental degradation and environmentalists were often regarded as anti-business extremists. As with other reform movements, however, there began to be some overlap. Gradually, some companies assumed leadership positions on environmental issues while others resisted. Why would large companies take the initiative to change their environmental practices?

There are two ways in which environmental responsibility may benefit the corporation. The first is lower costs. Companies that include environmental responsibility in their overall operations usually reduce waste and maximize resource efficiency, including capital resources. They also generally face fewer compliance costs, lower insurance rates, and a reduced incidence of litigation.¹ The second way companies can benefit from environmental responsibility is by improving their reputation. Many companies are coming to realize that a good name can be their most valuable asset.² It is widely believed that in the next decade corporate reputation will play an increasingly more important role in competitiveness.³

Proponents of free-market enterprise hold that if a corporation does anything but try to maximize profits, it will face bankruptcy.⁴ If a firm makes charitable donations or offers higher wages, it will face higher costs and will have to charge higher prices. Advocates of social responsibility argue that the byproducts of socially and

¹ Joel Mackower, *Beyond the Bottom Line* (New York: Simon & Schuster, 1994), 17.

² *Ibid.*, 105.

³ *Ibid.*, 105-6.

environmentally responsible policies may more than offset any costs associated with such policies. It is possible that higher wages will result in lower employee turnover, higher employee morale and the ability to attract a higher quality work force, resulting in better productivity and a better quality product for which consumers will be willing to pay more.⁵

Socially responsible investing (SRI) has evolved as a strategy limiting investments to socially and/or environmentally responsible firms. SRI and 'green' mutual fund managers maintain that good company behavior is good business.⁶ It is still widely thought that if investors traded securities for non-economic reasons in addition to economic reasons, the maintenance of these portfolios would require higher transaction costs than portfolios managed without such limitations. It is also argued that if the number of opportunities is limited, so is some of the potential for return.⁷ Many portfolio managers, however, have experienced no significant performance difference between socially responsible portfolios and those with no such restrictions.⁸

As I will discuss later, there are those in the field of SRI who say that limiting investments by screening for socially/environmentally responsible criteria does not penalize returns, but rather enhances them. It is the opinion of many investors today that a company's sense of social responsibility may reflect an intelligent and stable

⁴ Alan J. Miller, *Socially Responsible Investing* (New York: Simon and Schuster), 13.

⁵ Ibid.

⁶ Alan Reder, *In Pursuit of Principle and Profit* (New York: Putnam), 1994, 7.

⁷ Miller, 16.

⁸ Ibid.

management.⁹ Weeding out the socially irresponsible can result in a portfolio with a high percentage of well-run companies.¹⁰

In addition to tracking mutual fund performance and looking at case studies to assess the effects of social and environmental responsibility, it would be useful to know, on a large-scale, whether or not adoption of leading-edge environmental practices affects a company's profitability or competitive position in comparison to competitors who delay reform. For this thesis, I was interested in finding out if the environmental leadership benefits investors as well as the environment and if environmentally responsible companies are able to keep up with less progressive companies.

Central Question

Is there a correlation between corporate environmental responsibility, as evaluated by Fortune Magazine and the Council on Economic Priorities (CEP), and corporate financial performance, as measured by income as a percentage of sales and change in stock price?

I asked this question with the interests of both the investor and the corporation in mind. Can an investor limit his investments to environmentally responsible companies and get the same returns as other investors? In the case of the corporation, does good environmental performance affect profits? I was not asking if environmental responsibility leads to *greater* financial success than environmental irresponsibility, but rather, if environmental responsibility has a positive or negative effect on financial performance, or in the case of no correlation, no effect.

⁹ Ibid., 19.

¹⁰ Reder, 7.

I did not intend to prove any causation a correlation might seem to imply. A positive correlation between environmental performance and financial performance would be consistent with but would not establish any of the three following possible conclusions; 1) that successful companies are financially capable of improving environmental practices, 2) that savings from environmental improvements lead to financial success, or 3) that good environmental performance improves a company's reputation to such a degree that it benefits financially.

My thesis was an attempt to discover whether there is a relationship between environmental and financial performance through statistical analysis using a large sample of publicly traded companies in the Standard and Poor's 500 Index (S&P). I looked at the relationship between environmental performance and financial performance, representing each with two different variables.

For the purpose of this paper, environmental performance was judged by perception and objective research. I used the Fortune Corporate Reputations survey as a subjective measure of environmental responsibility and the Council on Economic Priorities' company ratings as an objective measure.¹¹ Financial performance was judged by both profitability and stock appreciation, measured by income as a percentage of sales and change in stock price, respectively. In analyzing correlations, I looked at all four combinations; perception vs. profitability, perception vs. stock performance, objective research vs. profitability, and objective research vs. stock performance. I then performed a case and control analysis, which focused on the specifics of several chosen companies using historical stock data.

¹¹ Later I will discuss CEP's scoring process and how I came to identify their research as objective.

In the following sections, I will discuss the relevance of my thesis topic to my studies at Brown University and my prior experience, what I hoped to learn and contribute through doing this project, and how I got started. Then I will review the literature in my area of study and the history of the problem under investigation. I will then detail my research and analytical methods, and finally, I will present my results and conclusions.

II. BACKGROUND

Evolution of Thesis Idea

Prior to studying at Brown University, I worked for the New York Public Interest Research Group (NYPIRG), a not-for-profit consumer and environmental organization formed in the late 1960's. I spent six months in New York City, a summer on Long Island, and a summer in Rochester. Working on statewide and local issues, I learned to appreciate the hard work that goes into competing with powerful lobbying forces. NYPIRG works to gather support for bills concerning environmental and consumer issues by building membership numbers. As has been proven by NYPIRG's continued success, 'people power' can sometimes be as influential as money. I learned at NYPIRG that political activism is an important tool for promoting environmental change.

At Brown, courses in economics, social research, federal regulation, and community organizing furthered my knowledge and helped me to develop my philosophy of an interdisciplinary approach to making progress toward environmental goals. Whether it is political activism, governmental regulation, economic approaches, education and spreading awareness, or business and market incentives, all approaches can be useful. As with any controversial issue, there is not one unique solution to environmental problems and no single way to achieve environmental goals.

Business fits into this paradigm, being another avenue for efforts toward environmental change. Because we live in a capitalist society and it is important to work with what we have, business is also a practical tool with which to promote environmental responsibility. Not only is big business just not going to go away, business, in the past,

has proved to be influential in promoting social change. Pulling out of South Africa to make a statement against apartheid is a well known example. Socially responsible investing (SRI) has begun to bridge the gap between 'greedy capitalism' and proactive environmentalism. The investors of today expect more from the companies they invest in than high returns and corporations value the opinions of their shareholders. I believe that the corporate arena is a very good place for environmentalism to receive the attention it needs.

The idea of business and social responsibility working together is of particular interest to me and was the motivation for this project. Every day, I realize the power of the dollar and make an effort to make good consumer decisions. I strongly believe that if more people were aware of ways they are currently spending their money that go against their principles, they would consider alternatives. However, many people will not change their habits (regardless of their principles) if it means making a sacrifice or not receiving some benefit in return. On a small scale, the moral benefit of switching to recycled toilet paper may be worth paying ten cents more. On a large scale, some investors are reluctant to invest in environmentally friendly companies if they do not get the same returns as when they invest without taking the environment into account.

The ultimate point of investing in the stock market is to make money and the point of business is to make a profit. The success of SRI tells investors that it is not a risk to have a socially responsible portfolio. A 1995 study, on the performance of twenty-eight SRI funds, reported that there was no significant difference between the returns of

the SRI funds and those of conventional funds.¹² The success of SRI might also be telling corporations that it will not hurt them if they clean up their act and might help them in the long run. They are also supporting these companies to make a statement which will influence other investors to add corporate social responsibility to their priority lists.

What I Hoped to Learn and Contribute

This study was my attempt to find out what the relationship is between corporate environmental responsibility and financial performance. It is important to note that in this study I looked at *environmental responsibility*, which is one aspect of social responsibility. I was interested to see how my results may differ from other studies on the broader category of general social responsibility of companies or on mutual fund performance. SRI funds generally have a large percentage of stocks in their portfolios from the financial industry or other industry groups that are not directly environmentally impacting. For example, approximately twenty-three percent of stocks that currently make up the Neuberger and Berman SRI fund are financial and retail firms.¹³ The universe of companies I chose for this study is not buffered by ‘neutral’ industry types. Because my interest was in environmental responsibility, apart from social responsibility, I had the opportunity to determine the correlation between environmental responsibility and financial performance, which had not been studied extensively.¹⁴

Internship at Neuberger and Berman

¹² Scott A. Guthridge, *Profit and Conscience? An Analysis of Investor Motivation and Financial Return of Socially Responsible Mutual Funds*, Senior Thesis, Millersville University, Department of Business, May 1995, 30.

The Socially Responsive Investment Fund of Neuberger and Berman (N&B), one of the oldest private firms on Wall Street, was created to meet the needs of its investors. Janet Prindle, a partner of the firm, started the fund in 1994 as a result of an increasing number of clients requesting limitations on their portfolios according to some of the social practices of the companies therein. Since then the fund has developed methods of screening for social responsibility that have secured good financial returns for its clients. Possibly as a result of requiring twice as much investigation (both social and financial screening) as the other mutual funds at N&B, the SRI fund had the highest returns of all the funds in 1995.¹⁵ The N&B SRI fund was also among the top fifteen percent of equity funds that out-performed the S&P in 1995.¹⁶

During the summer of 1995, I was an intern at N&B working directly with Joyce Haboucha, a portfolio manager in the Socially Responsive Investment Fund. The research that I did helped me learn about SRI and develop my thesis topic. I collected over 100 articles and studies on SRI as well as entire books questioning the risks of SRI. I found studies on mutual fund performance and statistical studies on social responsibility and financial returns.

Socially Responsible Investing

Spending the summer with N&B enabled me to familiarize myself with other SRI funds, research organizations that rank companies according to social responsibility, and other studies like the one I was about to undertake. Social and environmental

¹³ Information received directly from Neuberger & Berman as of 30 October 1996.

¹⁴ Other studies will be discussed later in this paper.

¹⁵ Wayne Harris, "Pious Payoff" *Individual Investor*, June 1996, 82.

responsibility have become a very important part of the business world in the past few years. It is no longer only in the interests of socially responsible investors and 'green' companies. I learned at N&B that portfolio managers outside of the SRI fund often had some clients who requested limitations in their portfolios. Companies whose purpose from the outset is to be 'Earth friendly' (like the Body Shop) are being joined by conventional corporations in efforts to lessen their impact on the environment.¹⁷

Since 1994, eight new SRI funds and banking programs have been formed in addition to the thirty existing funds.¹⁸ The number of SRI funds and the amount of money invested in a socially responsible manner has been on the rise since 1981. In 1993 it was reported that since 1991, ten SRI funds were created, bringing the total count to 25.¹⁹ The Social Investment Forum reported that the value of SRI investment portfolios had reached 600 billion dollars as of January 1992.²⁰ According to Lipper Analytical Services, the number of SRI funds increased from six in 1981 to thirty-two by the end of 1990.²¹ In August 1994, estimates of the numbers of SRI funds ranged from thirty to forty.²² and their assets were growing at twenty-five percent a year.²³

Some of the better known funds are Working Assets, Calvert, Parnassus, Pax World, Dreyfus Third Century, and Green Century. SRI fund managers obtain much of

¹⁶ Ibid.

¹⁷ My evidence for this statement is that throughout my research I have become familiar with heavily impacting companies that are working to become more environmentally responsible.

¹⁸ Guthridge, 3.

¹⁹ Jack Brill, Alan Reder, and Rhona L. Ferling, "Profit From Your Principles: Socially Responsible Investments" *Financial Executive*, November 1993, 54.

²⁰ Sally Hamilton and Meir Hoje Jo, "Doing Well by Doing Good? The Investment Performance of Socially Responsible Mutual Funds" *Financial Analysts Journal*, Nov/Dec, 1993, 62-66.

²¹ Ibid.

²² Scott Klinger, "Social Investing in a Changing World" *Bests Review*, 1994, 68-70., Eric Baker, "The Onslaught Rolls on", *Investing for a Better World*, Aug. 15, 1994., Debra Sparks, "Mission Impossible?" *Financial World*, Aug. 16, 1994, 48-49.

²³ Debra Sparks, "Mission Impossible?" *Financial World*, Aug. 16, 1994, 48-49.

their information from research firms that produce company social profiles and rate companies on social responsibility.

The Investor Responsibility Research Center (IRRC), based in Washington DC, is an independent not-for-profit group that analyzes information on the activities of corporations and investors and efforts to influence activities promoting corporate social responsibility.²⁴ IRRC distributes company research reports to its members, which detail environmental capital expenditure, accidents and spills, environmental programs, frequency of environmental audits, and other information on the company's social and environmental status. IRRC conducted a study with Vanderbilt University, which found that an environmentally responsible portfolio is likely to bring in the same returns as a portfolio constructed without limitations.²⁵

Kinder, Lydenberg, and Domini (KLD) provides the largest body of social research available on US and foreign corporations to the investment community. The Domini Social Index (DSI) is compiled by KLD, the screening for which begins with companies in the S&P, eliminates companies that do not qualify under specific social screens, and adds non-S&P companies that qualify socially. The index is organized in such a way that each of 400 companies is marked for having strengths and/or weaknesses in any of ten categories of social responsibility.²⁶ KLD tracks the performance of the

²⁴ Mark A. Cohen, Scott A. Fenn, and Jonathan S. Naimon, *Environmental and Financial Performance: Are They Related?* Study conducted by the Investor Responsibility Research Center and Vanderbilt University's Owen Graduate School of Management, April 1995.

²⁵ Ibid.

²⁶ *The Domini 400 Social index: Statistical Supplement*, Booklet (Massachusetts: Kinder, Lydenberg, Domini, & Co., April 1995).

DSI, which returned 70.41 percent from 1990 to 1994, in comparison to the 60.38 percent return of the S&P for the same time period.²⁷

The Social Responsibility Investment Research Services of Prudential distributes to its subscribers lists of companies that are involved in certain socially responsible or irresponsible activities.

The corporate environmental ratings compiled by the Council on Economic Priorities (CEP) are one of the measures I chose to use for this study. CEP not only provides investors and consumers with comprehensive information on each company, but also calls attention to very good companies and very bad companies. CEP publishes an annual list of “America’s Dirtiest Companies” and holds an annual black-tie event to present the “Corporate Conscience Awards”, receiving much media attention.²⁸

The most important message proponents of socially responsible investing want to convey is that the returns of SRI mutual funds and portfolios are not reduced because of limitations on the companies in which they may invest. Like any other fund, long-term success depends on the skill of the money managers and their investment techniques.

There are three basic strategies of SRI:

- *Avoidance investing* is eliminating from the portfolio any company that does not comply with the specific social standards of the fund.
- *Alternative investing* is investing only in very socially proactive companies (like Ben and Jerry’s).

²⁷ “Integrative Investing: Why Your Values Matter in the World of Money,” *Green Money Journal* (Spring/Summer 1995), Available from *Green Money On-line*.

²⁸ CEP is discussed in further detail later in the paper.

- *Activist investing* is investing in companies that need improvement in their social practices and using shareholders' resolutions to encourage companies to operate by ethically sound policies.²⁹

Social responsibility can be broken down into four categories of criteria, one of which is environmental responsibility.

- *Workplace issues.*: Does the company have good labor relations, good employment practices, family benefits, and a good overall human rights record? It is important that the company have worker health and safety programs. As far as the category concerning
- *Women's and minority issues*: There must be effective equal opportunity policies and female and minority representation on the board of directors.
- *Community and customer service*: Does the company have good customer relations and product safety and quality? Is the company active in community development and charitable giving?³⁰
- *Environmental responsibility* is perhaps the most diverse category of social responsibility. Not only does each industry differ in its level of impact on the environment, but there are also many different forms of environmental impact. A company that is considered to have good environmental performance has environmental standards and programs in effect, in addition to regulatory compliance. Green companies also may be leaders in the use of alternative energy and natural and sustainable farming and food production. Also included in the environmental criteria

²⁹ Miller, 29-34.

³⁰ Ibid., 25-29.

might be whether or not a company uses animal testing, pesticides, or is a 'sin stock', meaning the producer of alcohol, tobacco, or weapons.³¹

History of the Problem

Industry has been the cause of many environmental problems in this country. Natural resource use, toxic emissions, energy use, and hazardous waste are among the types of impact that industry has on the environment. With population increase, technological advances, and the demands of the capitalist economy comes the inevitable growth of industry and an increased threat to the natural environment. As we become aware of the risks associated with the careless exploitation of the Earth, we demand of industry not only the products that we need, but a more conscientious way of producing them.

The idea of economic benefit through environmental responsibility can be traced back to A.C. Pigou in the early 1900's. Pigou questioned Adam Smith's 'invisible hand of the market' idea. According to Pigou, it is a flaw in the free-market system that the market does not reflect the true costs of production.³² Although markets can set prices, they are incapable of recognizing external costs. For example, the market does not differentiate between wood cut from a clear-cut old-growth forest and that cut in a sustainable manner. The costs to the environment go unaccounted for in the price of the wood. In this and other cases, the environmentally irresponsible manner destroys future productivity and places health and other costs onto society and the ecosystem. Pigou's

³¹ Ibid.

³² Paul Hawken, *The Ecology of Commerce: A Declaration of Sustainability* (New York: Harper Collins, 1993), 75.

solution was to internalize external costs of production and hold the producer responsible. If the company then developed methods of production to prevent the externalities, they would have lower costs.³³

There have been several ideas for economic incentives to promote environmental responsibility, including taxes, tradable pollution permits, awards, and boycotts. Although socially responsible investing is not a direct way to internalize external costs of production, it can be seen as an incentive for companies to gain a competitive edge and be more attractive to a larger universe of investors, while cutting back on the cost to the environment. I was looking to see if there is some recognizable connection between environmental and financial performance in companies that have the potential to impact the environment substantially?

In this study I looked at all industry groups in the S&P, with the exception of those that, by nature, have minimal environmental impact. For the case and control part of my study, I selected four industry groups that, by nature, impact the environment substantially; manufacturing, chemicals, oil and gas, and electric utilities.

In this section I will discuss the environmental impact of the four selected industry groups and what is being done today to lessen environmental destruction and promote environmental responsibility in industry ('corporate environmental responsibility').

Manufacturing Industry

³³ Ibid., 79-80.

The manufacturing industry is one of the largest sources of hazardous waste and is very diverse, producing many different types of hazardous wastes in different capacities. Wastes have been disposed in landfills, waste drums, wells, pits, and containers that rust, leak, and break. Dumped hazardous wastes can leak into soils and seep into groundwater aquifers leaching into the water making it unusable and often impossible to clean up. Hazardous wastes often do not biodegrade and can take years or decades to leave the environment. Many wastes are also incinerated, an expensive process which produces hazardous waste ash and emits carcinogens, such as dioxin, into the air.³⁴ Air emissions of hazardous wastes from plants can be carried over long distances until deposited in rain, snow or other moisture.³⁵ Although there have been recent efforts to regulate the transporting and landfilling of hazardous waste, RCRA and CERCLA, for example, there is still work to be done toward pollution prevention.

Chemical Industry

The chemical industry is the largest industrial source of hazardous wastes.³⁶ Fifty percent of the metals, organic chemicals, inorganic chemicals, acids, and hazardous mixtures are emitted into the air and the other fifty percent are injected into wells.³⁷ Chemicals in soils can affect plant growth and insects or animals eating the plants.³⁸ The chemical industry is not solely responsible for the use and production of chemicals.

³⁴ Ibid., 47.

³⁵ Geoffrey Saign, *Green Essentials: What You Need to Know about the Environment* (San Francisco: Mercury House, 1994), 166.

³⁶ Ibid., 166-7.

³⁷ Ibid., 167.

³⁸ Ibid.

Nearly all other industrial operations rely on the production of organic chemicals.³⁹

Organic chemicals are necessary for manufacturing pharmaceutical products, cosmetics, plastics, food additives, photographic materials, clothing, agricultural chemicals, construction materials, automotive products, and electronic components.⁴⁰

Oil and Gas Industry

Oil is a nonrenewable resource, primarily used to manufacture plastic and gasoline, in addition to a number of other non-biodegradable products. Burned oil releases gases that contribute to the greenhouse effect. Incomplete combustion of oil also releases hydrocarbons, contributing to smog formation. Incomplete combustion of gasoline in motor vehicles forms carbon monoxide.⁴¹

Oil spills from refineries, pipes, and tankers, threaten and ruin ecosystems, killing populations of marine life. Oil clean-ups are long, difficult, and expensive. Dumped oil and drilling wastes leach into soils and waters. The EPA reported in 1994 that annually 179 million tons of oil wastes were buried at refinery sites, 18,000 tons go to community landfills, and fifty-seven million tons of oil field waste go to landfills.⁴² Drilling for oil also brings to the surface heavy metals, organic chemicals, toxic chemicals, and radioactive material, which can cause cancer and reproductive problems in animals. Plastic and other oil-based products yield toxic production waste. When these products are burned in solid waste incinerators, they yield dioxins and other toxic chemicals.⁴³

³⁹ David J. Sarokin, et al., *Cutting Chemical Wastes: What 29 Organic Chemical Plants are Doing to Reduce Hazardous Wastes* (New York: Inform, 1985), 13.

⁴⁰ Saign, 167.

⁴¹ Ibid., 266-7.

⁴² Ibid., 268.

⁴³ Ibid., 266-7.

Electric Utility Industry

Electric utilities are the largest emitters of sulfur dioxide, which is produced by burning high-sulfur coal and oil. Sulfur dioxide is an acidic gas that when emitted into the atmosphere, contributes to acid rain, the greenhouse effect, ozone depletion, and respiratory problems.⁴⁴ The United States meets its electricity needs, with approximately fifty-five percent coal, twenty percent nuclear energy, ten percent hydroelectric power, twelve percent natural gas, and three percent oil derived electricity.⁴⁵ The United States has more nuclear power plants than any other country. Nuclear power is expensive and dangerous.⁴⁶ Non-nuclear energy production has a heavy impact on health and exposure to radioactive waste can cause health problems, including cancer, as much as twenty years later.⁴⁷

Corporate Environmental Responsibility

Numerous companies have taken steps toward better environmental performance to improve efficiency, save on compliance costs and clean-up costs, reduce natural resource use, and improve their image. Environmental responsibility has become an important factor in total quality management.⁴⁸ Not all corporations agree to 'go green' without a fight. Ever since the Clean Air Act of 1970, large polluting corporations have

⁴⁴ Ibid., 365.

⁴⁵ Ibid., 127.

⁴⁶ Ibid., 250., Hawken, 84.

⁴⁷ Saign, 252.

⁴⁸ Paul Shrivastava, *Greening Business: Profiting the Corporation and the Environment* (Cincinnati, OH: Thomson Executive Press, 1996), 56.

been lobbying to weaken environmental regulations.⁴⁹ Now, the Environmental Protection Agency (EPA) and industry programs are looking for economic incentives for going green to influence companies. Companies are now marketing green products and alternative ways of manufacturing products with less environmental impact.

According to Industries are required by the Emergency Planning and Community Right-to-Know Act, to publish yearly Toxic Release Inventory (TRI) data on more than 300 chemicals. TRI data are available to citizens through contacting the EPA.⁵⁰

EPA programs, such as 'Green Lights' and '33/50', are efforts to involve large corporations in cost-efficient energy conservation and pollution control. 33/50 is a voluntary program designed to cut toxic emissions by thirty-three percent by 1992 and fifty percent by 1995. In 1995, over 250 companies were involved.⁵¹ Since 1991, hundreds of corporations have become involved in the EPA's Green Lights program, the goal of which is to reduce electric consumption of US corporations by fifty percent.⁵²

The Chemical Manufacturers Association launched Responsible Care in 1988. Now, approximately 224 companies have become part of this voluntary initiative to improve the performance of the chemical industry in safety, health, and environmental quality.⁵³ Members of the Chemical Manufacturers Association represent ninety percent of US chemical production. Responsible Care requires member companies to implement six Codes of Management Practice. The goals of the Pollution Prevention Code are long-

⁴⁹ Hawken, 111.

⁵⁰ Saign, 393.

⁵¹ Francis McInerney and Sean White, *The Total Quality Corporation: How Ten Major Companies Turned Quality and Environmental Challenges to Competitive Advantage in the 1990s* (New York: Penguin, 1995), 279.

⁵² Saign, 89.

⁵³ John F. McAllister, "Responsible Care: The Chemical Industry's Initiative to Improve Safety, Health, and Environmental Protection," *Forbes*, 24 April 1995.

term reductions in the amounts of all releases to air, water, and land, continuous reductions of wastes generated at facilities, and responsible management of remaining wastes. According to the Toxics Release Inventory, by 1995 the chemical industry had recycled, recovered for energy, or treated ninety-three percent of its byproducts.⁵⁴

Because existing companies are under regulatory pressure to improve environmental performance, there is a growing market for environmental technology. Many companies are emerging as or focusing on being innovators of products for environmental safety and technology. Although further technology as a solution to environmental problems associated with technological and industrial growth is often frowned upon,⁵⁵ there is a demand for such products as 'scrubbers', for example.

Pollution control equipment, such as scrubbers, air filters, waste incinerators, sewage treatment plants, and bioremediation systems is now in demand, as are environmentally friendly consumer products.⁵⁶ Private sector expenditures on environmental protection equipment in the US now exceed fifty billion dollars a year.⁵⁷ The global demand for green products is more than 200 billion dollars a year.⁵⁸ It is thought that since green business is becoming mainstream and many consumers are willing to pay more for environmentally sound products, it is a strategic opportunity.⁵⁹

In order for companies to claim their products as environmentally sound, there is the need to develop standards. The International Standards Organization (ISO) is now

⁵⁴ *Profiles in Prevention: Case Histories of Pollution Prevention in the Chemical Industry*, Booklet (Washington, DC: Chemical Manufacturers Association, 1995), 3.

⁵⁵ The argument here is that using more of the problem to find a solution to the problem might be self-defeating, an analogy being drinking more alcohol to cure a hangover. Hawken, 32.

⁵⁶ Shrivastva, 56.

⁵⁷ *Ibid.*

⁵⁸ *Ibid.*

⁵⁹ *Ibid.*

working on the ISO 14000 series, which will be standards for environmental protection and improvement. In compliance with the new standards, companies will be required to adopt an Environmental Management System program to implement environmental programs, auditing, planning, and training.⁶⁰

Literature Review

There are numerous articles, books, and studies on the subject of socially responsible investing. I have broken down the literature on this subject into three categories; support for SRI and green business, skepticism of SRI, and other studies like mine.⁶¹

Support for Socially Responsible Investing and Green Business

There is a relatively large body of literature today that supports the ideals of corporate social and environmental responsibility. Much has been written about the financial benefits of social responsibility on both businesses and investors⁶² and the merits of keeping portfolios 'green'.⁶³ In an article in the Westchester Business Journal from August of 1994, Stephanie Fincuane says that today it can mean better business if companies institute green strategies and that many people are tailoring their portfolios and investing in SRI mutual funds.⁶⁴

⁶⁰ *ISO 14000: Information Update*, Booklet (Connecticut: GE Environmental Programs, 1995), 1-3.

⁶¹ Unless specified, 'SRI' includes environmentally responsible investing.

⁶² Mackower, Miller, Reder.

⁶³ Stephanie Fincuane, "Stockbrokers Discuss the Merits of Keeping Portfolio in the 'Green'," *Westchester County Business Journal*, 33 (August 1994), 7.

⁶⁴ *Ibid.*

Increasing in popularity is the belief that corporate social and environmental responsibility contributes to the overall quality of the corporation. James Collins and Jerry Porras, in their book, *Built to Last*, look at companies that have soared above their competitors and point out the differences in quality between ‘visionary’ companies and comparison companies, finding that ‘visionary’ companies have grown successful by placing a high priority on the quality of their whole operation, rather than just the size of their bottom line.⁶⁵ *The Total Quality Corporation*, by Francis McInerney and Sean White looks at companies that have included environmental management in their total quality management and have succeeded in improving efficiency by reducing waste.⁶⁶

In addition to social and environmental responsibility being good for the corporation and the investor, there is also the belief that business has an important obligation toward the environmental movement. In *The Ecology of Commerce*, Paul Hawken claims that because corporations are the dominant institution on the planet, they must address the social and environmental problems that afflict the human race.⁶⁷ He believes we are moving in the direction where the purpose of business is not solely to make money, but also to create a service to increase the well-being of humankind.⁶⁸ Hawken refers to organizations such as, Business for Social Responsibility and the Council on Economic Priorities and many others that are beginning to integrate corporate life with social and environmental principles.⁶⁹

⁶⁵ James Collins and Jerry Porras, *Built to Last*, (New York: Harper Collins, 1994).

⁶⁶ Francis McInerney and Sean White, *The Total Quality Corporation*, (New York: Truman Talley Books, 1995).

⁶⁷ Hawken, xiii.

⁶⁸ *Ibid.*, 1.

⁶⁹ *Ibid.*, xiii.

Because of the increasing approval of the marriage of business and the environment, much has been written on the ways in which businesses can become environmentally responsible. *Greening Business: Profiting the Corporation and the Environment* by Paul Shrivastava is essentially a handbook for improving the environmental performance of business. Corporations today are faced with the challenge of transforming into environmentally sustainable entities.⁷⁰ The transformation cannot take place without a major commitment. A corporation must ensure the integrity of the facility and its products from reducing emissions and conserving energy and materials to minimizing waste generation and cleaning up hazardous waste. The corporation must also manage its relationships with the media, regulatory bodies, stockholders, and the public on environmental and health issues.⁷¹

Skepticism of Socially Responsible Investing

I found that the arguments against socially/environmentally responsible investing are based on one of three premises. 1) Are the green funds really green? 2) Can big corporations really be green? and 3) Business should not be mixed with charity. Some environmentalists are reluctant to trust big business and some business people refuse to make investments based on anything other than financial growth.

In an article entitled, "Mission Impossible?", in *Financial World* from August of 1994, Debra Sparks questions the integrity of socially responsible investing. She points out that "Peter Kinder [of KLD] says his firm's Domini Social Index has outperformed the S&P by ten percent over the past four years, yet his Domini Social Equity Fund slightly underperformed the S&P in the three year period ending June 30, 1995." She

⁷⁰ Shrivastava, 15.

says that SRI funds managers like Kinder seem to have difficulty picking socially responsible companies that also reward their investors. Although Sparks continues to find fault with SRI, saying that the fund managers rarely agree on which companies are good and which are bad, she closes the article referring to a study done at Santa Clara University comparing seventeen SRI funds to the New York Stock Exchange over a ten year period. The study concluded that the SRI investors are likely to do about as well as ordinary investors.⁷²

“How Green are the Green Funds?” by Ricardo Sandoval in the *Amicus Journal* reports that in the Spring of 1995 about forty of the 4000 mutual funds are socially and/or environmentally responsible and together manage more than three billion dollars. Up until 1993, green funds were doing consistently well in comparison to conventional funds. Despite the widespread belief that a recent slight dip in performance⁷³ is only temporary in the larger upward trend, Sandoval finds reason to be skeptical.

Sandoval questions the standards of the green funds that continue to outperform the more “pristine” funds. The more diversified SRI funds seem to have done better than the strictly environmental funds, possibly due to “shifts in the political winds”. In other words, it is possible that socially responsible investing and environmental research firms lose attention when there is a Republican administration in power.

The article attempts to look at the performance of the greener funds compared to that of the less green funds and points out specific companies that particular funds were holding that put them on a lower position on the green scale.

⁷¹ Ibid., 16.

⁷² Sparks, 48-9.

⁷³ In 1994 it was reported that some funds were in a state of weaker performance and those funds were near the top at other times. Klinger, 70.

It is fortunate that there are people who scrutinize the screening process of the various SRI mutual funds, but as Mindy Lubber of Green Century Funds points out, in the world of investing nothing is black and white. Just as there are no pristine companies, pristine SRI funds are hard to find.⁷⁴ This article depicts socially-responsible investing as a cunning way to try to make money from the environmental movement. To address this argument directly, I would compare it to the practice of taking any issue that people feel strongly about and capitalizing on it. For example, some lawyers specialize in sexual harassment or personal injury suits; issues that are currently ‘in vogue’ and evoke emotion. In a similar way, SRI fund managers can be seen as using their specialty to get more clients.

In an article from *Earth Times*, “Is Big Business Really Green?”, Adil Najam (from MIT’s department of Urban Studies and Planning) states that green business thinks it is “becoming the environmental conscience of the world” and that business is only interested in the “dollar-back green”. Najam says environmentalists “feel cheated as their ‘cause’ is ‘hijacked’” and are resentful toward businesses that “seem to be motivated by the gods of cost efficiency and maximized profit much more than environmental concerns”. Najam’s belief is that for corporations to be truly green, would require more “deep-rooted shifts in paradigms and philosophies.” He is concerned that actions that are good for the environment but motivated by other concerns are being credited as environmental victories.⁷⁵

⁷⁴ Ricardo Sandoval, “How Green are the Green Funds?” *The Amicus Journal*, (Spring 1995), 29-34.

⁷⁵ Adil Najam, “Is Big Business Really Green?” *The Earth Times*, 5 November 1993 (Reprinted on America On-line).

Other Studies Like Mine

I found several studies comparing corporate social and/or environmental performance to financial performance. Some of the studies I will discuss in this section will be discussed in further detail later in the paper. A study entitled *Corporate Social Performance and Corporate Financial Performance: Correlations and Implications* was conducted at Boston University's School of Management by Jennifer J. Griffin and John F. Mahon in 1994. This study looks at companies in the chemical industry and uses the Fortune magazine survey results, TRI data, and KLD ratings to measure social performance. Five different financial measures are used; return on equity, return on assets, total assets, asset age, and five-year return on sales). The study found a correlation between the Fortune data and the financial data, but no correlation for either of the other measures of corporate social performance.⁷⁶

IRRC did a study in 1995 entitled *Environmental and Financial Performance: Are They Related?* which was conducted in conjunction with Mark Cohen, a professor of management at Vanderbilt University. This study merely looks at SRI fund performance, which as I discussed earlier, is influenced by the skill of the money manager. Because my study looks not at fund performance, but at company performance directly, I eliminated the possibility of the fund manager variable affecting my results.

The Vanderbilt study found that investors who look for environmental responsibility when choosing companies for their portfolio do as well or better than mainstream investors. The study used government data on Superfund sites, compliance penalties, toxic releases, and oil or chemical spills to form two industry-balanced sample

portfolios, one ‘high pollution’ and one ‘low pollution’. “This study suggests that the increasing attention being paid to environmental management issues, by both corporations and the investment community may well be warranted from the perspective of financial self-interest”.⁷⁷

A study done in 1995 by Scott A. Guthridge at Millersville University analyzes the financial returns of socially responsible mutual funds. The study, *Profit and Conscience? An Analysis of Investor Motivation and Financial Return of Socially Responsible Mutual Funds*, compares the returns of twenty-eight SRI funds to the return of the S&P index and the Lipper Fund Averages over a period of five years (1989 to 1994) and concludes that the SRI returns are not statistically different from that of the market or other mutual funds.⁷⁸

There are several other studies that I found looking for correlations between social and/or environmental responsibility, none of which found a negative correlation. Other studies include *Does it Pay to be Green?* by Stuart L. Hart and Gautam Ahuja.⁷⁹ KLD has been comparing the performance of its index of 400 socially responsible companies (including S&P and non-S&P companies) to the S&P 500 and finds that their index performs as well or better.⁸⁰ The Environmental Protection Agency has been studying the financial benefits of environmental improvements on corporations. Studies have shown that investment in energy-efficient equipment goes directly to the bottom

⁷⁶ Jennifer J. Griffin and John F. Mahon, *Corporate Social Performance & Corporate Financial Performance: Correlations and Implications*, Boston University, School of Management, 1994.

⁷⁷ Cohen (see footnote 6).

⁷⁸ Scott A. Guthridge, *Profit and Conscience? An Analysis of Investor Motivation and Financial Return of Socially Responsible Mutual Funds*, Senior Thesis, Millersville University, Department of Business, May 1995.

⁷⁹ Stuart L. Hart, *Does it Pay to be Green?*, University of Michigan, School of Business Administration, 1994.

line.⁸¹ Participants of the Green Lights program have realized a forty percent rate of return on their investments in new energy efficient technologies.⁸²

⁸⁰ *The Domini 400 Social Index*, A-3-A-5.

⁸¹ Jacquelyn Ottman, "EPA's Partnership with Industry Prevents Pollution and Boosts Economy," *Forbes*, 9 September 1996, 209.

III. METHODOLOGY

Developing a Research Design

My research design evolved as I learned more; deciding what to research, what information I needed to obtain, and what questions I needed to answer was an ever-changing process.

My first idea about how to answer my central question was to take ten companies that are environmental leaders and ten laggards and compare the financial performance of the two groups. Another idea was to take a group of companies that have adopted environmental auditing and have implemented environmental programs and see how, if at all, the environmental improvements directly enhance or adversely affect the bottom line. Both of these research designs rely on very small samples. The results of a study using small samples might not be representative of a larger universe. To use the latter method, I would also have to rely on a very small sample of companies and pin-point exactly where in the balance sheet the effects of environmental practices are being reflected. Companies

⁸² Ibid.

are just beginning to incorporate environmental costs into their accounting practices. Conventional accounting methods can conceal or distort environmental costs.⁸³ Other problems associated with the use of small samples will be discussed in the next section, where I will discuss how I chose my universe of companies.

Another idea for a research design was to create my own ranking system, using criteria I found to be important in judging the environmental performance of corporations. I rejected this idea because I was uncertain about how to weight the categories of environmental criteria and to differentiate between objective and subjective criteria. I also found that by including company scores and rankings, compiled by research organizations, my body of information was repetitive in some places and conflicting in others. This was evidenced later when I found a very low correlation between the Fortune scores and the CEP scores.

During the process of developing a research design I learned that for any design I needed to answer the following questions. What criteria do I use to judge environmental performance? What criteria do I use that are necessary and sufficient to judge all industry groups? Is my sample large enough to produce results that are representative of the larger picture?

Company Universe

There were several considerations to address in defining a universe of companies. Most importantly, the business activities of the chosen companies need to have a

⁸³ R. Darryl Banks, Daryl Ditz, and Janet Ranganthan, eds., *Green Ledgers: Case Studies in Environmental Accounting*, (Washington DC: World Resources Institute, 1995), 1.

⁸⁴

significant impact on the environment. I define environmental impact as a large-scale involvement in natural resource use, energy use, toxic emissions, or hazardous waste. Rather than limiting my study to companies of one particular industry group, I chose to use a large sample of companies and eliminate the industry groups that are minimally impacting. The larger companies within each industry group are the most impacting.

Next, I looked at environmental capital spending as a possible variable to use to represent a company's environmental activity and compare that to financial performance. In other words, do environmental investments pay off? This might have been possible if I were looking at a small sample of companies. It may be easier to detect the impact of environmental spending, particularly on the bottom line, on a small company.

Lastly, I considered access to information. Unlike small companies, large companies are included in the large indexes, such as the S&P, making financial information more easily accessible and traceable. The socially responsible mutual funds have very few small companies in their portfolios and research organizations follow mostly large companies.⁸⁵

After consideration of these three factors, I decided to include in my study only large, environmentally impacting, public companies that are in the S&P 500. I eliminated companies from the financial, retail, wholesale, hotel, and communications industries. These industry groups have little direct impact on the environment. The following is a list of the industry groups included in my study.

Aerospace
Auto parts
Automobiles

⁸⁵ A large percentage of S&P companies comprise the research bodies of the three firms I found most useful to me in this study; IRRC, KLD, and CEP.

Beverages
Boats
Chemicals
Computers
Construction
Cosmetics
Defense
Electric utilities
Electrical equipment
Electronics
Foods
Footwear
Furniture
Greeting cards
Health care
Home products
Imaging
Machinery
Manufacturing
Medical products
Metals
Mining
Natural gas
News papers
Office equipment
Oil & gas
Paper & forest
Pharmaceutical
Printing
Publishing
Restaurants
Textiles
Tobacco
Toys
Transportation

Environmental Criteria

There are numerous ways in which a corporation could be judged on environmental performance. I could have looked at public perception of a company's reputation. Or I could have focused on one or many of the ways a company impacts the environment, from recycling to hazardous waste disposal. To reach a decision on which

environmental criteria to use, I first attempted to define my own image of 'greenness'. In my opinion, a green company is one that has minimal impact on the environment, which is somewhat justified by the usefulness of the product being manufactured. By these standards, very few of the companies included in my study can be considered green. Consequently, for my thesis I included companies that may not fit my image of greenness, but that have more environmental impact and are companies manufacturing products that can be considered luxuries. My reasoning was that I wanted a large sample of companies and that my study would be more meaningful if it looked at an entity that could sufficiently affect the quality of the environment. Furthermore, I not only looked at companies that are either green or non-green, but rather a complete spectrum of companies requiring me to quantify greenness in order to determine each company's degree of environmental responsibility.

I tried to develop my own environmental scores for each company by using criteria I thought to be important in telling if a company is green or not and creating my own scoring system. For example, I might have given a company a point for each EPA program it subscribes to. I might have given a company a point if its board of directors has an environmental committee and a point if it distributes an environmental report. I was going to subtract points for excessive toxic releases or hazardous waste as documented in the TRI data.

I then began to add the environmental scores and rankings from various research organizations to my spreadsheet. Some information is gathered through public opinion surveys and some research is objective. Soon I was faced with the question of whether or not to treat objective and subjective information differently and the problem

of weighting the scores. I would have had to use my own judgment as to which information is more or less important. For example, I had to rank the ranking indices (Fortune, CEP, Domini, IRRC, and others) in order of importance or treat them all as equal. I would have had to use my own judgment as to which indexes had more merit or included information that I considered important. If I found CEP's ranks to be a better measure of environmental performance than Domini's evaluations, I might have had to double the CEP score. The issues of double-counting and weighting led me to search for other methods.

While I was judging the merits of each source, I discovered that CEP's evaluation methods drew on all of the information I was intending to include in my scores. Using my data and including CEP's evaluations would have been repetitive as well as giving those data too much weight. CEP's method of judging corporate environmental responsibility is thorough and it does not include perception of the overall environmental reputation of companies. I decided to use the CEP scores to represent an objective judgment of environmental responsibility and Fortune's Corporate Reputations survey scores to represent a subjective judgment.

The Council on Economic Priorities

The Council on Economic Priorities (CEP) is an independent, not-for-profit public interest research organization, supported by nationwide membership and individual and foundation grants. CEP's goal is to inform and educate the public and to provide incentives for corporations to be good citizens, responsive to the environment, and to the social concerns of their stockholders, employees, neighbors, investors, and

consumers.⁸⁶ CEP's membership ranges from mutual fund managers to students. Information can be accessed through the mail and on the internet. In addition to providing corporate social research results to its members, CEP holds the Corporate Conscience Awards each year, honoring companies for innovative policies in environmental stewardship and other areas of social responsibility.

CEP rates the social records of 800 companies, including the S&P and adds more each year. *Shopping for a Better World* is a publication geared toward a general audience of consumers, categorizing companies by product as well as alphabetically. *SCREEN* is a publication distributed to CEP members in the investment community and categorizes companies by industry type. In addition to the ratings, in-depth social and environmental profiles on these companies are available to CEP members. The environmental ratings are based on several categories, including toxic releases, packaging, use of raw materials, toxic reduction, community health, energy conservation, natural resources, accidents, spills, compliance issues, and environmental technologies. Size and type of industry are considered in scores and ratings are based primarily on US operations.

The CEP scores are composed of informed qualitative and quantitative data. The information on which the environmental ratings process is based is gathered from a company questionnaire, a review of company literature (10K,⁸⁷ environmental, and annual reports), government data bases (TRI), and media clips. Then CEP develops weightings for the environmental ratings subcategories and send the preliminary ratings

⁸⁶ Council on Economic Priorities, *Mission Statement*, Pamphlet (New York: CEP, 1996).

⁸⁷ According to section 13 of the Securities Exchange Act of 1934, corporations are required to file an annual report on form 10-K, which consists of financial statements, management discussion, stock holder matters, and other updates.

to the companies for review. For each industry, a different set of weightings is developed. “The weight emphasizes the importance of the subcategory as it relates to the environmental impacts of the industry.”⁸⁸ After reviewing the ratings and making changes, the ratings are finalized.⁸⁹

I met with Alice Tepper Marlin and Sean Moulton of CEP in the Spring of 1996. My mission was to familiarize myself with the organization responsible for the research I intended to rely on for much of my study. I wanted to learn as much as I could about their scoring process for the environmental category in their index. Sean Moulton walked me through the environmental scoring process. CEP uses industry specific categories of environmental criteria. For example, TRI data would be useful for scoring companies in the chemical industry, but irrelevant for retail companies. Each industry group is scored separately on a specific scale and in a different manner. Because there are differences in type and quantity of categories of environmental criteria used to score companies in each industry group, the raw scores for each industry group are on different scales with different ranges. The ‘raw’ scores for the chemical industry range from 1.2 to 18.1, whereas, the raw scores for the manufacturing industry range from -3.4 to 9.8. In order to put all the companies on the same scale, for comparison and easy reference, the raw scores are translated into grades from A to E, A being the most environmentally responsible and E being the least, for that particular industry group (like a report card). If a retail company and a chemical company both score an A, it does not mean that the chemical company has the same environmental impact as the retail company, only that

⁸⁸ This quotation is taken from unpublished CEP literature under section heading, “Environmental Ratings Methodology” (New York: CEP).

⁸⁹ Ibid., “Environmental Ratings Process”.

they both are environmental leaders in their particular industry group.⁹⁰ In my study, I only included companies in the S&P, therefore, there was not necessarily a full A to E spectrum of CEP scores in each industry group.

Another important difference between the CEP raw scores and the CEP scaled scores used in this study is the fact that I was able to receive the most recent raw scores which were not yet incorporated into the most recent publication of SCREEN that was available to me. The raw scores that I have and the scaled scores that I have for each company cannot be directly compared.

For my purposes, I converted the scaled scores to numeric scores from five to one, five being equivalent to A. For statistical analysis using a large sample of companies, I used the scaled scores. For analysis looking at smaller, industry specific samples, I used the raw scores, which are on a mathematical scale, allowing me to use the Pearson parametric analysis.⁹¹

Fortune Magazine

Fortune Magazine's Annual Corporate Reputations Survey ranks 395 companies from 41 industry groups. Eight categories are used to derive the composite score of each company. One category is Environmental and Community Responsibility. The list is formed by first surveying over 10,000 of the top senior executives, outside directors, and financial analysts, selected from a data base of the Fortune 500 and Fortune 1000.⁹² The

⁹⁰ This information was gathered through two meetings with CEP, March 1996 with Alice Tepper Marlin and Sean Moulton (at CEP) and June 1996 with Anthony Raya (by phone).

⁹¹ Results of parametric statistical analysis are more useful than those of nonparametric analysis in that the sample can represent a larger universe. Statistical analysis is discussed in more detail in the data analysis section of this paper.

⁹² Information received directly from Fortune.

respondents are asked to rank the ten largest companies in their particular industry group for each of the eight categories.

The annual results of the Fortune survey call attention to the importance of a company's reputation and corporate culture in long-term success. Only three of the eight categories in the survey pertain to financial aspects of corporations. There is a growing interest in taking into account factors other than financial figures in predicting the future success and growth of a company. Many CEOs aspire to place their companies in the top ten.⁹³ The Fortune scores are widely respected and are used in academic studies, such as the Boston University study I mentioned earlier, and are published in Fortune Magazine each year. The 1994 and 1995 environmental scores are used in my study as a subjective measure of environmental responsibility and are treated separately from the objective measure (the CEP rankings).⁹⁴

Advantages and Disadvantages

There are advantages and disadvantages to choosing to use two types of environmental assessments. The advantage of using the CEP scores was that CEP's research is very comprehensive and includes most of the environmental criteria I would have used if I researched each company myself. CEP also had access to more information. I could never have gained access to their company questionnaires. One disadvantage to using the CEP research was that I had difficulty obtaining all of the raw

⁹³ Rahul Jacob, "Corporate Reputation," *Fortune*, 6 March 1995, 54-90.

⁹⁴ The results of the Spearman analyses and the results of the Pearson analyses cannot be directly compared due to the difference in type of statistical analysis.

scores I needed. Although I am a CEP member, access to their database is not one of the privileges. They were kind enough to download the raw scores for two industry groups for me. Aside from that, it was not completely practical to use the raw scores because they were scored separately by industry, making the sample sizes very small. For example, there are only twenty-two companies in the chemical industry sample. The raw scores are on different scales for each industry group, therefore, until CEP has converted the scores into the scales scores, the scores cannot be compared across industry type.

The advantages to using the Fortune scores were that the Fortune study is well known and respected and it is used in other studies like mine, making it possible to compare my results with those of the other studies. The disadvantage was that I could not be certain how accurately Fortune represents perception. The Fortune scores may be less than an accurate representation due to the 'halo effect'. Respondents may be reluctant to change their perception of a company that has maintained a certain reputation in the past. Rubbermaid, for example, has had a stellar reputation, scoring number one overall in the Fortune survey several years in a row. The truth is, however, that Rubbermaid's performance has been on a down swing. For 1995 Rubbermaid's profitability (measured by income as a percentage of sales) was negative twenty-seven percent. Although it is not a concern, it should be noted that a time lag for changing perceptions and bias are probably factors influencing the Fortune survey results.

Financial Variables

Financial success is a factor of good management practices, good innovation, the value of the product, efficiency, rising productivity, and the ability to respond to

customers and markets.⁹⁵ I had to select some measures of the financial success of companies. I first asked myself the following questions. Do I want to represent stock or bottom line performance? Do I want my variable to be from the perspective of the investor or the company itself? And how many variables are sufficient?

I chose to use one variable to represent stock market performance and one to represent bottom line performance. I learned that corporations frequently look at Return on Investment (ROI) to evaluate financial performance.⁹⁶ ROI is a financial ratio which expresses profits in relation to capital investments and takes into account many items that go into the balance sheet. ROI is often used as a basis for comparing companies, serving as a measure of management efficiency.⁹⁷ I decided against using ROI as a measure of financial performance because it tends to differ substantially across industry groups. Perhaps I might have used it for intra-industry comparisons.

Investors often look at earnings per share (EPS) to gauge the financial performance of a company.⁹⁸ EPS indicates the net income earned for each share of stock outstanding. Because EPS tends to be affected by methods of depreciation and other accounting conventions for one-time events,⁹⁹ I eliminated the option to use it as a variable in my study. I wanted to find a broader way to represent stock and bottom line performance and be able to include a large sample including varied industry groups.

⁹⁵ This view of financial success is widely accepted in the business community.

⁹⁶ J. Blaine Reeve, *Tips & Terms from the Experts: Comparisons*, America On-line, Financial Research, 1996.

⁹⁷ Ibid.

⁹⁸ Ibid.

Income as a Percentage of Sales

As a measure of profitability (bottom line performance), I decided to use income as a percentage of sales, an operating number taken from a company's income statement. Income as a percentage of sales and other variables expressed as percentages are found on common size statements, primarily used for comparing two or more companies.¹⁰⁰ It is also used in academic studies to compare the financial performance of companies.¹⁰¹ Income as a percentage of sales is calculated by subtracting the cost of goods sold and SG&A (selling and general administrative expenses) from total revenues (sales) and dividing by sales. I did not subtract items lower on the income statement, such as taxes or interest on debt because these reflect the specific financial strategy of the company. The higher up on the income statement I remained, the better chance I had to represent a company's general operating performance, which is more likely to be influenced by its environmental performance, but not influenced by taxes, debts or other factors irrelevant to my purposes.¹⁰² Other measures of profitability, such as EPS and ROI, utilize more of the income statement in their calculation. With income as a percentage of sales, there are fewer factors affecting profitability.

⁹⁹ An example of a method of depreciation is spreading the cost of an asset over its useable life. There are many different accepted methods of depreciation, differing over industries.

¹⁰⁰ Marilyn Pitchford and Arthur Young, *Tips & Terms from the Experts: Common Size Statement*, America On-line, Financial Research, 1996.

¹⁰¹ Griffin study (Boston University) uses Income as a percentage of sales as a measure of financial performance. Cohen study (IRRC) uses accounting returns expressed as percentages. Income as a percentage of sales is also described as being useful in statistical studies on financial performance, Oswald D. Bowlin, et al., *Guide to Financial Analysis*, Second ed., (New York: McGraw Hill, 1990), 30.

¹⁰² Ibid.

$$\text{Income}\% \text{Sales} = \frac{\text{Sales} - \text{Costgoods} - \text{SG \& A}}{\text{Sales}}$$

Equation 1. Income as a percentage of sales

Stock Appreciation

I chose to use the change in stock price over a two year period (1993 to 1995) as my second financial variable. The financial industry typically uses the end of year (12/31) prices for each stock as a common denominator for comparing the performance of two or more companies.¹⁰³ If the performance of a company is being assessed for a one year period, the appreciation of the stock is calculated using the end of year stock price from the first year and the end of year stock price from the second year. I looked at the performance of the companies in my study over a two year period. I took the end of year price for 1993 and the end of year price for 1995 for each company and calculated the percent increase or decrease in price for that time period.

$$\Delta \text{Stock Price} = \frac{12 / 31 / 95 - 12 / 31 / 93}{12 / 31 / 93}$$

Equation 2. Change in stock price

Although actual stock price is not representative of the success of a company, the percent change in stock price is often an indication of a company's financial performance. The dollar value of a company in the stock market (market capitalization) is

found by multiplying the number of outstanding shares by the stock price. For this study however, I was interested in stock price performance. It was not necessary to find the market capitalization for each company's stock price. Factors affecting stock appreciation are profitability, future expectations, innovation, investment, expansion, and growth. Analysts predict the future performance of a stock according to these and other factors. If a company exceeds these expectations, the stock will go up. If the company does not meet the expectations, the stock will be sold and the price will drop.¹⁰⁴ Therefore, the movement in stock price is a reflection of the market's view of the success of a company. It is also the way an investor is rewarded for owning shares of a successful company.

It may be legitimate to be skeptical of two points in time accurately representing an entire two year period. What if the CEO died on December 31? Occasionally, an oil spill, accident, or other event dramatically affects a company's stock price for a short time. However, it is typical practice to compare the stock performance of two companies by looking at two single points spanning a certain time period, taking the risk that some event may have affected the stock price on one of those days. My sample, being much larger than two companies, is likely to represent an accurate example of stock performance, with which to compare to the environmental data. If one company has been clearly misrepresented, it is acceptable to eliminate extremes in my data (outliers). In the case and control test, I generated graphs that illustrate stock performance over a longer period of time and plot monthly stock price performance.

¹⁰³ Using end of year stock prices is standard industry practice.

¹⁰⁴ Jeremy J. Siegel, *Stocks for the Long Run: A Guide to Selecting Markets for Long-Term Growth* (Chicago: Irwin, 1994), 199.

Since I was not actually buying and selling stocks for this study, it would have been legitimate to consider using the average stock price for the year. I decided against this idea for several reasons. First and most importantly, I wanted to stick with conventions and use the method of measuring stock performance that the financial industry has for years. Investors typically compare companies at the same time of year because of indicators that affect the stock market at certain times of the year.¹⁰⁵ I was concerned with how companies compare at the same time, in the same market, with the same influences so that all other factors are equal. Investors do not buy and sell stocks at an average price or compare stocks at different times of the year for each stock. My intentions were to represent the performance of companies as it affected investors.

It should be noted that the financial measurements in my study were for a period of strong economic and market performance (the 'bull market'). If all stocks were going up during the time of my study, would my results have been an accurate representation of stock market behavior? The answer is yes. A bull market is a typical market behavior. It is the nature of the market to go up and down. I was looking at how much a stock increases, not *if* it increases. Nevertheless, in comparing financial performance, it must be noted that companies that were financially good at the beginning and end of the period (the best financial companies) could not be expected to produce gains as large as those who went from bad to good.

In the case and control test, I looked at the ratio of the stock performance of the leader to that of the laggard over a five year time period. This is a longer time period,

¹⁰⁵ The January indicator, for example is the tendency for stock market movement in January to set the market trend for the entire year. Information received through conversation with Joyce Haboucha of Neuberger & Berman.

which may make it easier to correct for the bull market. By looking at a longer time period, I would not be forced to rely fully on the past two years. Looking at the ratios between two companies shows not that the companies are improving, but if one is improving more than another and by how much.

Correcting for Industry

CEP and Fortune include in their rankings companies belonging to all industry groups. In order to avoid confusing high scoring non-impacting companies with environmental leaders, I eliminated from my study industry groups such as financial, communications, and retail, which have minimal environmental impact. Studies comparing SRI fund performance to that of other mutual funds often do not point out that a substantial percentage of stocks in SRI portfolios are financial and retail companies, thus diluting the true comparison between environmental leaders and laggards in the heavily impacting industry groups.¹⁰⁶

Industries differ financially as well as environmentally. I considered industry type in deciding not only which companies to include, but what about the companies I was going to study. Each industry group varies slightly in every aspect. Judging financial performance using a particular measure may work for one industry, but not for another. I had to choose the financial measure that would fit most of the industry groups I was using, considering I wanted to choose industry groups according to how they impact the environment, not how easily they can be measured for financial performance. Even having eliminated non-impacting industry groups, there are still differences across the

¹⁰⁶ See footnote 1.

industries in the ways they impact the environment. I might have chosen different financial variables according to industry in the parts of the study separating the industry groups, which is a possibility as a suggestion for further study. It is extremely difficult to find a measure for environmental performance that could be used to judge all companies in each industry group. Perhaps the ISO 14000 standards will eventually solve this problem.

I feel confident in my decision to use CEP and Fortune as my environmental criteria, as far as dealing with the problem of industry differences. CEP scores companies according to industry, taking into account a company's industry type and how it is doing environmentally compared to other companies in the same industry. Fortune asks its respondents to score companies in their own industry groups. Each respondent is only ranking companies in one industry group. It is assumed that a company's score is relative only to other companies in the same industry.

To further remedy the problem of industry differences, I performed a case and control test (to be discussed later) in which I categorized companies according to industry. I also looked for correlations for specific industry groups using the CEP raw scores for the chemical and manufacturing industries, as I will also discuss later in the paper.

Data Gathering Methods

Fortune Magazine publishes the overall scores for social responsibility annually. I was able to obtain the Fortune Community and Environmental scores directly from

Fortune. The CEP scaled rankings were available to me in CEP's publication, *SCREEN*. I was able to get some of the raw scores from their computer data base.

For income as a percentage of sales, I was able to find most of the data in America Online's Financial area. I looked up each company in Hoover's Company Profiles¹⁰⁷ and took the end of year 1995 numbers for sales, cost of goods sold, and SG&A. For the companies that were not listed, I took the numbers from their annual reports. The Wall Street Journal and CompuServe's Historical Stock Prices were the sources I used to obtain the numbers to calculate the change in stock price.¹⁰⁸

Data Analysis

Correlations were measured using the Pearson parametric correlation coefficient. I was fortunate to have received the generous assistance of Jerry Harkins for the statistical analysis part of my thesis.¹⁰⁹ In addition to testing for correlations using large samples, I performed a case and control test involving twelve companies in four selected industry groups. I also generated graphs to illustrate each correlation and each case and control comparison.

In addition to choosing specific types of statistical analysis, it was necessary to state a null hypothesis and a significance level for my results. The null hypothesis is that there is no relationship between corporate environmental and financial performance and any correlation must have occurred by chance. In order to reject this hypothesis and accept the alternative hypothesis (that the correlation represents a relationship) the

¹⁰⁷ Hoover's Company Profiles are available from America On-line in the Financial area.

¹⁰⁸ Historical Stock Prices are available from CompuServe in the Financial area.

correlation must have equal to or less than a five percent level of significance. This means that there is a five percent chance that the correlation I find is a result of a random fluctuation. It is standard scientific practice to reject the null hypothesis at the five percent level. I chose to use the five percent level because the consequences of rejection of the null hypothesis in this case are not dire. A study in the field of brain surgery, for example, would require a much more stringent significance level, perhaps between one and two percent.¹¹⁰ Significance is tested in this study by comparing my results to the critical values of the test statistics in each two-tailed test that is performed for at least a five percent level of significance.¹¹¹ The purpose of the Pearson analysis is to look for the existence of an association. The significance test looks for the degree of association between two sets of scores.

The Pearson product-moment coefficient of correlation was used to assess the strength of the relationship between the environmental scores, as the independent variables, and the financial variables as the dependent variables. This is a parametric statistic in which the sample is presumed to be drawn from a universe in such a way as to render the sample statistically comparable to the universe.

In the present case, the sample consists of all eligible members of the S&P 500 index, which has long been used as an accurate surrogate for the entire US equity market. The Fortune survey rankings are scaled so that the scores are normally distributed or nearly so. In the case of financial ratios, the data are probably not normally distributed.

¹⁰⁹ I received advice from Jerry Harkins as to which statistical tests were appropriate for this type of study and he was available to answer my questions. All research, decisions, and calculations were my own work.

¹¹⁰ Sidney Siegel, *Nonparametric Statistics* (New York: McGraw-Hill, 1956), 7-9.

¹¹¹ Critical values can be located in the appropriate tables in the back of any statistics text book. I used Roger Porkess, *The Harper Collins Dictionary of Statistics* (New York: Harper Collins, 1991), 254-5. The Vanderbilt study uses a significance level of five percent. The Guthridge study uses a level of ten percent.

However, relative performance is normal and the two are highly correlated. The better a company does in absolute terms, the higher the probability that it will also do well in relative terms. It was suggested to me by Jerry Harkins that because the Fortune and the financial data are, for the most part, on normally distributed scales, the use of the Pearson parametric correlation was appropriate.

After initially using an alternative statistical analysis to look for correlations between CEP scores and financial data, I found that Pearson was the more appropriate statistical analysis. Although the CEP scores are on a ranked scale (discussed later), the sample met the qualifications for Pearson. The CEP samples were all comprised of over 100 companies and was close enough to a normal distribution to use a parametric statistic, such as Pearson.¹¹²

Conditions that must be satisfied for a parametric test are the following. 1) The observations must be independent, meaning the selection of any one case for inclusion must not bias the chances for inclusion of any other case. 2) The observations should be drawn from normally distributed populations. And 3) The variables involved should be measured in an interval scale, in which it is possible to use mathematical operations on the scores such as adding and finding means.¹¹³

The variables in the Pearson formula are explained as follows. n is the number of companies in the sample, x is the financial variable, and y is the environmental variable.

¹¹² The distribution of the CEP scores has a probability of 99.9% to be normal, according to the Kolmogorov-Smirnov Goodness of Fit Test.

¹¹³ Ibid., 19 (Referring to information in this and the previous two paragraphs).

$$S_{xy} = \sum_{i=1}^n \frac{(x_i - \bar{x})(y_i - \bar{y})}{n}$$

Equation 3. Pearson's product moment correlation coefficient

I had originally decided to include the Spearman rank correlation coefficient, which is nonparametric, meaning the “model does not specify conditions about the parameters of the population from which the sample was drawn”.¹¹⁴ Nonparametric tests do not require interval measurements, most using ‘ordinal’ or ranked scale data. An ordinal scale can be one where the values are descriptive such as ‘more than’, ‘less than’, or ‘higher than’.¹¹⁵ I was going to use the Spearman correlation to look for correlations between the CEP rankings and the financial data. The CEP scaled scores were already organized as ranks, so it was not necessary to convert them beyond translating the alphabetized letters into numbers.¹¹⁶ I was also able to arrange the financial numbers according to rank. I decided against Spearman for the following reasons. Since the CEP distribution was normal, I was able to use Pearson, which is a stronger test for significance. Spearman is generally not used to analyze large populations Although Pearson is generally used for samples whose variables are on an interval scale, in this case, Pearson was appropriate for each analysis in my study.¹¹⁷

¹¹⁴ Ibid., 31.

¹¹⁵ Ibid., 24.

¹¹⁶ Ibid., 25. As discussed earlier, the CEP rankings for each industry group include a full range from A to E. For my study, I only used the S&P companies, leaving out, in some cases, the top and/or bottom ranking in a particular industry group.

¹¹⁷ In an earlier draft I had used Spearman to analyze correlations with the CEP scores because they were not on an ordinal scale, which is required for Pearson. It has since been pointed out to me, by Prof. John Antrobus, the program head of experimental cognition in the Department of Psychology at City College of

Other parametric statistical tests I might have considered are Student's t-test and Fisher's z transformation. Both of these tests are appropriate for hypothesis testing, meaning they can be used to determine statistical significance. The t-test, however, is generally used to determine whether or not two samples are likely to have come from the same two underlying populations that have the same mean when the standard deviation of the parent population is unknown and the variances of the samples are assumed to be equal.¹¹⁸ In the case of my study, it is known that the variances are unequal and the standard deviations of both the environmental data and financial data are known.

Fisher's z transformation is generally used to compare the results of a small study to a larger parent population.¹¹⁹ For example, if I had only included twenty companies in my study, I could have transformed the Pearson correlation coefficient into a z value, using the Fisher calculation, which produces a function that is approximately normally distributed. Then I could have found the probability of my small sample being comparable to a larger population. Since my sample size was large and my distributions were very close to normal, I was able to use the Pearson correlation, the results of which are already representative to a larger population. I might have utilized the Fisher transformation for the results of the CEP raw score correlations, had they been higher.

CEP and Fortune Only Sample

My original idea was to use only companies that were scored by both CEP and Fortune so that I would have the same companies for each statistical analysis. Later I

the City University of New York, that the effect of the noncomputative nature of ranked scores is insignificant with a sample as large as that used in my study. The results I had previously calculated using Spearman are consistent with the present reported results.

¹¹⁸ Porkess, 219-222.

decided to increase my sample by using the full Fortune and CEP lists, but I still went ahead with the CEP and Fortune only analysis to see if the results differed. I used Pearson to compare the Fortune scores and the financial variables and to compare the CEP scores and the financial variables. For the CEP and Fortune only sample, I performed a total of four statistical analyses.

Full Fortune Sample

This analysis was of a much larger sample. I looked at all of the appropriate (environmentally significant) companies in the Fortune survey and compared the Fortune scores to income as a percentage of sales and change in stock price using two Pearson analyses.

Full CEP Sample

In this test I looked at all appropriate companies ranked by CEP and used two Pearson analyses to compare CEP and income as a percentage of sales and change in stock price.

CEP Raw Score Samples

I obtained the CEP raw scores for two of the industry groups included in my universe; manufacturing (eight companies) and chemicals (twenty-two companies). Although these are small samples, I was able to use the Pearson parametric analyses because the raw scores are on a mathematical scale. Using the CEP raw scores in this way provided me with the opportunity to look for correlations within specific industry

¹¹⁹ Ibid., 86.

groups. I was also able to see if I would get drastically different results using very small samples.

Perceptual vs. Objective Research

The correlation between the CEP scores and the Fortune scores was measured using Pearson.

Profitability vs. Stock Appreciation

The correlation between income as a percentage of sales and change in stock price was measured using Pearson.

Case and Control Study

The idea for doing the case and control test came from my interest in the methodology used for the study in the book, *Built to Last*, by James Collins and Jerry Porras. Companies used in comparison were similar in size, age, and several other aspects, but one company became much more successful than the other. The companies were studied to see what the more successful companies had been doing to achieve such a level of excellence relative to another company with the same market and the same opportunities for success.

In the case and control part of this study, I looked at stock performance of industry leaders and laggards over a five year period. Each comparison looked at one of four industry groups. I chose four industry groups that have significant environmental impact: manufacturing, chemicals, oil and gas, and electric utilities. Each company is a

large publicly traded company in the S&P 500, is compared to another company in the same industry group, and differs only in that it is on the opposite side of the spectrum of scores in the environmental category. The two companies compared were the one with the highest environmental score or rank and the one with the lowest. For the manufacturing and chemical industries, I performed two tests, one for companies scoring highest and lowest according to Fortune and one according to CEP. For the oil and gas and electric utilities industries, there was one comparison for each based on the Fortune scores only because the CEP raw scores for these industry groups were not available to me.

In addition to graphs generated on Excel, which depict the past five years of stock performance with five data points, I include graphs generated on the Bloomberg Market Data System, which show more data points, longer time periods, normalization, and comparison to the S&P. Although I had drawn the boundaries of the case and control study to the past five years and the end of year stock price for each year, the Bloomberg graphs provide a more detailed background upon which to overlay my own results. Having a 'back-up' such as this provides some insurance against the possible problems mentioned earlier. More data points and a longer time frame may ameliorate concerns about the bull market and using the end of year stock price. The normalization option allowed me to create graphs starting two companies at the same point. As I mentioned earlier, it does not matter if one company starts at a higher price. It is the percentage change in price that is important.

IV. RESULTS AND FINDINGS

All results are listed in the table in Appendix C and are illustrated in figures 1 through 26 in Appendix B. Significance levels were found using the table of critical values for the Pearson correlation coefficient, provided in Appendix D.

CEP and Fortune Only Sample

Figure 1 illustrates the relationship between the Fortune scores and change in stock price for the CEP and Fortune only sample. The Pearson correlation coefficient is 0.18. There are 119 data points in this analysis with the elimination of outliers.¹²⁰ This correlation is significant at a level of five percent, which indicates statistical significance.¹²¹ Before performing any analysis, I anticipated a minimum level of significance of five percent, which, as I discussed earlier, is appropriate for a study of this type. According to my results, companies in this sample that do better financially also are scored by Fortune as having better environmental performance.

The Pearson correlation coefficient for the Fortune scores and income as a percentage of sales is 0.24. This is significant at a level of one percent; also highly significant. There are 122 data points in this analysis. No outliers were eliminated. This correlation is illustrated in figure 2.

Figure 3 graphically presents the relationship between the CEP scores and change in stock price for the CEP and Fortune only sample (122 companies). The

¹²⁰ Outliers eliminated were more than two standard deviations away from the norm. This was determined with the help of Jerry Harkins. Outliers (symbol/change in stock price/Fortune score) eliminated in this analysis are SUNW 2.12328767/6.32, SPP 1.99509804/4.55, and F 1.85333333/6.79.

Pearson correlation coefficient for CEP scores and change in stock price is 0.004. This correlation is not significant.

The Pearson correlation coefficient for this sample of companies comparing CEP scores and income as a percentage of sales (as depicted in figure 4) is 0.04 and is not statistically significant.

Full Fortune Sample

The Pearson correlation coefficient for Fortune scores and change in stock price is 0.22. See figure 5. Having a sample size of 197, the correlation is significant at a level of five percent. Two outliers are eliminated in this analysis.¹²²

The Pearson correlation coefficient for Fortune scores and income as a percentage of sales is 0.23, also highly significant at the two percent level. In this analysis two outliers are eliminated.¹²³ See figure 6.

Full CEP Sample

The Pearson correlation coefficient for CEP scores and change in stock price is 0.04. This correlation (172 companies) is not statistically significant. This relationship is illustrated in figure 7. For the analysis comparing CEP scores and income as a percentage of sales, on the other hand, a small negative correlation is found (-0.0005). See figure 8.

CEP Raw Score Samples

¹²¹ Table of critical values for statistical significance are included in Appendix D.

¹²² Outliers eliminated in this analysis are SFX 2.10084034/5.48, SPP 1.99509804/4.55.

¹²³ Outliers eliminated in this analysis are NUE -0.222097054/5.95, UIS -0.140533399/5.4.

Using the CEP raw scores, which are on a mathematical scale, I was able to use the Pearson analysis for small, industry specific samples. The results are not particularly noteworthy, being a mix of low positive and slightly negative correlations. The Pearson correlation coefficient for raw chemical scores and change in stock price is -0.04. See figure 9. Raw chemical scores and income as a percentage of sales has an even larger negative correlation of -0.19, as shown in figure 10. The correlation coefficient for raw manufacturing CEP scores and change in stock price (figure 11) is 0.08, positive, but not significant for a sample size of 8. Raw manufacturing and income as a percentage of sales has a correlation coefficient of -0.25 and is illustrated in figure 12.

Perceptual vs. Objective Research

The Spearman correlation coefficient for the comparison of the CEP scores and the Fortune scores is not significant at -0.04. (See figure 14) It is important to note that the two sources I used to judge environmental performance are not in agreement. I would have predicted a much higher correlation between CEP and Fortune, which, in this sample, are judging the same companies for the same year. As I discuss later, however, there are clear-cut differences between objective research and the results of a survey based on perception.

Profitability vs. Stock Appreciation

The Pearson correlation coefficient for the comparison of income as a percentage of sales and change in stock price (using the CEP and Ftn. Only sample) is 0.009, as depicted in figure 13. This correlation is lower than any of those comparing each financial variable to

the Fortune scores. Does this mean that a company's stock performance is more affected by its environmental performance than its profitability? Probably not. Nevertheless, anyone involved in business would like to assume that a company's profitability is somewhat correlated with its stock performance. An efficient market is one in which security prices fully reflect all relevant information that is available about the value of the securities.¹²⁴ As I will discuss later, it would be interesting to study the relationship between profitability and stock appreciation at different times when the market is under different influences.

Case and Control Study

In the case and control test, the results of which are graphed in figures 15 through 26, I compared two companies in each of four industry groups, manufacturing, chemicals, oil and gas, and electric utilities. One company is the highest scoring in the environmental category in the Fortune survey and the other company has the lowest score. For manufacturing and chemicals, I also looked at the highest and lowest scoring in the CEP raw scores. I graphed the stock performance of the comparison companies for a five year period. Then I compared each company's performance to that of the S&P for the same period. I also noted the profitability of each company for the last year of the comparison and the Fortune score from 1994 as well.

¹²⁴ David R. Henderson, ed., *The Fortune Encyclopedia of Economics*, (New York: Time Warner, 1993), 569.

In only one case does the less environmentally responsible company perform better overall than the more environmentally responsible company. In at least four out of the six comparisons, the company with the higher environmental score is at an advantage, when taking into account all considerations; time period, S&P performance, and profitability. In all cases the environmentally responsible companies did as well or better than their competitor in comparison to the performance of the S&P index. In other words, the green investor is not at a disadvantage. I will mention again that external factors affect stock expectations and performance and it is not environmental performance alone that affects stock performance. However, in the majority of cases, there appears to be no financial penalty attached to a better environmental score.

V. CONCLUSIONS

Interpretation of Results

This study found that the Fortune environmental scores for both sample sizes are positively and highly correlated with both measures of financial performance for the years 1993 to 1995. Of the correlations between the CEP scores and the financial variables, the results are mixed; one correlation being negative and three being very low. The correlation between the CEP scores and the Fortune scores is also low, as is the correlation between stock appreciation and profitability.

My first observation is that the perception of market professionals correlates with market performance, leading me to believe that these professional perceptions may have an influence on financial success or that the perception of market professionals is influenced by financial success. It is clear that the Fortune respondents agree that corporate environmental responsibility is a good thing and companies that are responsible are also financially successful, my only evidence being the strong correlation that I found.

My next observation is that the CEP scores, which are my objective measure, are neither highly correlated with the Fortune scores nor with the financial variables. It is interesting that the perception of professionals is not supported by the results of objective research on the same subject. I find it ironic that environmental scores based on perception correlate with financial performance, but scores based on the detailed research of a professional organization do not significantly correlate with financial performance. As I will discuss later, it would be interesting to test whether or not the Fortune scores

correlate with other objective measures of environmental performance. As I will also discuss, the discrepancy between the Fortune and CEP scores can be explained by differentiating between the natures of perceptive and objective measures, especially used for this kind of study.

The *Built to Last* study, which I referred to earlier, performs a case and control test comparing very successful companies to similar companies which have not become as successful. The study found that the very successful companies (‘visionary’ companies) had incorporated strong social values into their management from the outset. The study was conducted by looking in-depth at the histories of each ‘visionary’ company and each comparison company. The *Built to Last* study analyzed the Fortune Most Admired lists for the years 1983 to 1990. Although the ‘visionary’ companies are represented in the Fortune survey, there was not a particularly strong correlation between the eighteen ‘visionary’ companies and the top Fortune companies. In 1989, all of the eighteen visionary companies and two of the comparison companies fell in the top thirty percent of the Fortune list (the top 100 out of approximately 350).¹²⁵ In my study, no correlation was found between social responsibility judged by the Fortune survey and social responsibility judged by the objective, in-depth research conducted by CEP.

There are several possible explanations for the above observations. One explanation might be that CEP has higher standards in their judgment of corporate environmental responsibility than the Fortune survey respondents. CEP might assign a company a low score and the same company might receive a higher score from Fortune. Not only might CEP be more judgmental of a company’s practices than the Fortune

¹²⁵ Collins, 234.

respondents, but CEP might also have more current and accurate information with which to judge a company's environmental performance. The CEP researchers probably have more of a genuine interest in revealing the truth about the companies they are studying than do corporate professionals answering a survey. As I have pointed out earlier, however, the Fortune survey is well respected, but the respondents might have limited information.

Without further study, there is no way of knowing with certainty the accuracy of the Fortune scores or the CEP scores, for that matter. I can only know from doing this study, that there is a notable difference between my subjective and objective measures. I find it necessary to consider the assumptions behind the perceptions of the Fortune respondents. If a company is financially successful, it may be perceived to be well managed across the board and would perhaps receive a high environmental score.

The Fortune respondents ratings might also reflect out-of-date information, which I refer to as the 'time lag' issue. Perhaps the CEP scores are the more current and more accurate representation of corporate environmental performance. It is possible that the effects of these scores have not yet been recognized by the Fortune respondents. As I discussed earlier, perceptions take time to change and this might be a reason why companies perceived to be environmentally responsible by Fortune are financially successful. The high scoring companies in the Fortune survey may be those that have already established an environmental program and are now receiving the benefits from it. As I discussed earlier, 'going green' costs a company money initially, but saves money in the long-run. The companies with high CEP scores may include those that have just recently made investments in environmental responsibility. Because CEP communicates

directly with the company and looks at current environmental reports and disclosure statements, it is probable that recent investments in environmental improvement would be reflected in the scores. This could explain why some companies with high CEP scores do not perform as well financially as the companies with high Fortune scores. There is no way of knowing (within the scope of this study) in what stages of environmental responsibility companies are, which may be an important factor in whether or not they are being rewarded financially.

According to the results of my study, perception is a better predictor of financial success than objective measures. From the point of view of the potential investor, it is clear that following Fortune is wiser than following CEP. Successful green investors must be using objective company research other than CEP and possibly are taking company reputation into account. It would also be advisable for corporations to give priority to promoting whatever environmentally responsible activities they have underway.

An explanation for the high correlation between Fortune rankings of environmental responsibility and financial performance might be the mere fact that “perception wins out over reality”.¹²⁶ Perception and reputation of a company (superficial or not) are very important in the decision making of companies and investors. Boycotts protesting Styrofoam packaging at McDonald’s and the tuna industry’s fishing practices that harmed dolphins affected only one percent of the market. Nevertheless,

¹²⁶ Mackower, 97.

both efforts were successful. Despite the negligible financial loss, the public's ill feelings about these companies' products was sufficient to motivate them to change in 1990.¹²⁷

Measuring corporate reputation and linking it to financial performance has been gaining significant importance. In 1994 more than two dozen academic studies were published on the connection between the two.¹²⁸ Many studies have been attempted and have faced problems, a common complaint being that there is not an accurate method of measuring corporate reputation.¹²⁹ Many studies have used the Fortune survey results to measure corporate reputation. Yankelovich partners, a Connecticut based financial firm, has been tracking company reputations for twenty years, determining companies' "corporate equity" scores, which are based on several aspects of reputation. Yankelovich has found that companies with good reputations outperform other companies on a number of dimensions. Specifically, companies with the highest scores consistently showed the highest price-to-earning ratios on their financial statements.¹³⁰ The Yankelovich study was not based on actual social responsibility, but perceptions of social responsibility, this being an increasingly important part of the equation.¹³¹ Yankelovich is also cited as having said that a company's reputation helps it to perform well during hard times in the market.¹³²

My results might have been different had the study's data not been taken during a bull market. I cannot claim that my results necessarily predict for anything except the market during the time period on which the study was focused. For the most part, the

¹²⁷ Ibid.

¹²⁸ Ibid., 106.

¹²⁹ Ibid.

¹³⁰ Ibid., 107. (Although Mackower cites this study, Yankelovich Partners denies the existence of it.)

¹³¹ Ibid.

¹³² Ibid.

period between 1993 and 1995 was a bull market. Common sense would suggest that the factors that operate in a bull market may not operate in a bear market.

Another important observation that may or may not be connected to the bull market issue is the low correlation between stock appreciation and profitability. It would be logical to assume that companies that are profitable also do well in the stock market. The fact that the correlation between profitability and appreciation was lower than the correlation between the Fortune scores and financial performance led me to believe that my results were very strong or that the market is extremely inefficient.¹³³ A better explanation for this phenomenon might be the following. Since the market tends to anticipate performance, a company's stock price may increase during the time period before the actual profitability is realized.¹³⁴ In effect, I am looking at 'year 0' for appreciation and 'year 1' for profitability.

Standard Economic Theory

Although proponents of socially responsible investing and the results of several studies support the belief that the returns of a restricted portfolio are not penalized, it is necessary to address the probable reactions to this study of proponents of traditional market theory. It seems to make sense that if there are two investors, one with a restricted portfolio and one with an unrestricted portfolio, the one with the unrestricted portfolio can do at least as well as the other, by picking the same stocks, and sometimes better, by picking better alternatives. With this reasoning, standard economic theory would suggest

¹³³ The Pearson correlation coefficient for profitability and stock appreciation is .10. The Pearson correlation coefficient for profitability and environmental performance (judged by Fortune) is .25. It might

that portfolios that are unrestricted should do better in the long-run. Nevertheless, studies showing that there is no significant difference between the returns of restricted and unrestricted portfolios suggest that in practice, it does not work out the way it might in theory.¹³⁵ It has been said that a socially responsible investor may sacrifice an annual percentage point, particularly if determined to maximize the social impact of investments. It has also been said that socially responsible investments are better in the long-run because they avoid such pitfalls as liability suits, and lower employee morale.¹³⁶

There are two assumptions that might be overlooked when asserting standard market theory in this instance. First, if the non-restricted group is expected to have an advantage over the restricted group, then it is assumed that the restricted choices are not better than the non-restricted. In this case, the choices are not necessarily worse or limited randomly. In the case of social/environmental responsibility, there are reasons, which I have discussed, that the restricted choices would be as good or better than the rest. Second, traditional market theorists assume that the manager in charge of choosing from the non-restricted pool of companies has good information and knows where to look to find better alternatives than those companies in the restricted group. It certainly is not the case that all socially responsible companies are worse financially than all socially irresponsible companies. It is also not the case that all managers of non-restricted portfolios have the same skills as managers of restricted portfolios.

seem that the former would be a stronger correlation than the latter, making the latter correlation seem relatively strong.

¹³⁴ See footnote 105.

¹³⁵ Miller, 16-17.

¹³⁶ Richard Andrews, "Investing with an Eye on the Dual Bottom Line", *Vermont Business Magazine*, vol. 22, Iss. 2, Feb. 1994, Sec. 1, 37.

Another reason why standard economic theory would question the economic advantages of socially responsible investing is that environmental programs and any other programs to enhance anything other than financial aspects of a company are costs that lead to lower returns. As discussed earlier, it is possible that companies that include social and environmental policy in their overall management have a better future, which will include lower costs and more efficient production. Proponents of traditional market theory would recommend that a company comply with regulation only to the point that compliance is less costly than avoiding regulation. This would be the way a socially/environmentally irresponsible company would operate and may result in transaction costs from constantly changing processes to comply or not comply with regulation. It is important to point out, however, that a company choosing to avoid costs in this manner, would not only be environmentally irresponsible, but economically deficient as well. Environmental investments can lead to lower costs in the long run, as can saving money in the short-term, my emphasis being that the method prescribed by traditional market theorists might not be the best for every company and might not be the best method in the future.

A distinction can be made between companies that behave in an environmentally responsible way and companies that are particularly environmentally responsible. The former group of companies might invest in environmental programs only up to the point where it would pay off financially in the long-run. Presumably any well managed company would make such an investment, whether or not it was particularly concerned about the environment. The latter group might take financial risks when investments will

have a positive environmental effect. These companies can be referred to as ‘altruistic’ companies.

There are two reasons why the advantages of social/environmental responsibility may conflict with traditional market theory. First, as discussed above, a company may be able to lower costs in the long-run by adopting more sustainable methods of production. Second, a company may do better financially by improving its reputation. It could be argued that reputation is not concrete or sufficient evidence of a firm’s merit. It is important to point out, however, that any investor looks beyond company reputation when putting together a portfolio. If a company misrepresents its degree of environmental responsibility in its advertising, it will not last long in any manager’s portfolio. Most socially responsible investment funds have careful screening processes for this reason. A good reputation is very important for companies to maintain, but only if the reputation reflects the reality beneath the surface.

The most important possibility that must be emphasized is that SRI may succeed despite portfolio restrictions because they are actually weeding out less-than-average companies and investing in companies that are better quality and have more potential for success. Good environmental and/or social management might be a signal of good overall management.

How Do My Results Compare to Those of Other Studies?

The results of this study are generally consistent with most of the studies I cited earlier. There are also some interesting differences, which are worth discussing. The Guthridge study compares the performance of socially responsible mutual funds to that of

the S&P index for 1995. The study concludes that in comparison to the S&P index, an investor will receive the average return of the market (when investing in socially responsible mutual funds) but nothing significantly additional.¹³⁷ As I mentioned earlier, the success of mutual funds is not only dependent upon the fact that SRI portfolios are restricted to socially responsible companies and other portfolios are not. The skill of the money manager is an important factor in the performance of any fund.

The study conducted by IRRC, Marc Cohen, Scott Fenn, and Jonathan Naimon, like my study, compares environmental performance (apart from social responsibility) to financial performance and eliminates environmentally non-impacting industry groups in the S&P. The study measures environmental performance with nine selected objective variables, based on spills, penalties, and toxic chemical releases. Financial performance measures are accounting returns and stock market returns (dividends and stock price appreciation). In more than eighty percent of the comparisons conducted in the study, the time frame of which was 1987 to 1989 (primarily a bull market), the “low-pollution” companies performed better than the “high-pollution” companies.¹³⁸ In comparing the results of this study to mine, I find it noteworthy that they found significant results using objective criteria to measure environmental performance, while my study only found significant results using the subjective criteria (Fortune scores). A possible explanation for this difference is the following. Had my study been conducted during the same time period, the CEP scores might have coincided with the IRRC evaluations and the two studies might have produced similar results. The low-pollution companies in the IRRC study might have either become worse over time or have not improved significantly

¹³⁷ Guthridge, 30.

enough to be considered low-pollution companies in relation to companies that have recently become environmentally responsible. In other words, high scoring companies in 1989 could be considered mediocre compared to the environmental leaders of 1995. Newly environmentally responsible companies might have adopted more technologically advanced methods of pollution control and are considered better environmentally than those that were considered good in 1989.

The Griffin study uses Fortune's Corporate Reputation scores, TRI data, and KLD reports to "triangulate" toward a representative measure of a firm's corporate social performance.¹³⁹ This is the same idea I had in deciding to use the Fortune scores to represent perception and the CEP rankings as a more objective perspective. The study also uses more than one measure of financial performance, but does not look at stock price performance, only operating performance. The study found that among the small sample of seven chemical companies (Dow, PPG, DuPont, Grace, Union Carbide, Monsanto, and Occidental) there was a closer relationship between the more perceptual measures (Fortune and KLD) and the financial information than the objective measure (TRI) and the financial information. The study is based on 1992 for all social and financial data sources. In my study, I found no significant correlation between the CEP raw scores (for chemical companies) and the financial measures. It would be useful for future study, to look at the correlation between small industry-specific samples using the Fortune environmental scores.

Recommendations for Further Study

¹³⁸ Cohen, 8.

¹³⁹ Griffin, 379.

Throughout and upon completion of this study I have identified several recommendations for further study. First, there is the need for a method to correct for industry types in large samples of companies. Correcting for industry differences is difficult because this correction reduces sample size and therefore statistical power. It might be useful to conduct a study using very large industry-specific samples, correcting for company size rather than industry group. This study would include companies outside of the S&P. Another useful study might be to look at smaller, more focused samples and to analyze actual bottom line reactions to actual environmental investments over time. This would remedy the problems of industry differences and small samples. With large samples, it is possible to use statistical analysis. With small, industry specific samples, in-depth analysis can be done looking at financial specifics. An example would be to look at all environmental investments and then look at the costs and/or savings associated with each investment.

Another suggestion would be to compare the financial performance of companies in the earlier stages of environmental improvement to that of companies who have established environmental programs and policies. It might prove useful to look at the CEP scores of companies that have become environmentally responsible in the past year and compare their financial performance to high scoring companies that have had environmental programs for five years or more. The results of a study such as this might answer the question of whether or not there is a delay in companies receiving the benefits of environmental responsibility.

Most SRI funds are relatively young, five years or less. Therefore nearly all funds have yet to weather a serious down turn in the stock market.¹⁴⁰ It may prove to be useful to conduct this study again in the future.

Final Thoughts

It may seem like common sense that a successful business requires good management, innovation, good product quality, and good working conditions. But, until recently, the only measure of success was in dollars. Now investors are looking at much more than good financial performance as requirements for growth and long term success. I gather this from the growth in the numbers of SRI funds and the numbers of articles and studies I have found on the subject of social and environmental responsibility and financial success. Environmental responsibility is proving to be an important factor influencing corporate competitiveness.

The results of the case and control and Fortune analyses in this study support that the perception of good environmental performance means good business. It is possible that companies scored highly by CEP will be recognized in the next Fortune survey. It is also possible that there are too many extraneous factors affecting the financial variables I have chosen to reflect environmental influences. Because I cannot be certain, I would guess that the truth lies somewhere in between the two possibilities.

Nevertheless, I do not doubt the importance of corporations in the environmental movement. With the newly developing ISO 14000, there will be yet another way for consumers and investors to discern corporate environmental responsibility. Companies that make the ISO grade will be permitted to label their products as environmentally

¹⁴⁰ Brill, et al., 8.

sound.¹⁴¹ As far as the traditional economic view of the market, I believe we as a society are becoming wiser. The purpose of investing in the stock market is to make money, but most of us invest to create a more secure future for our families.

¹⁴¹ Reder, 170.