

CHAPTER 7

SUMMARY AND CONCLUSIONS

7.1 INTRODUCTION

The problem investigated in this study is whether there is a positive relationship between the environmental responsibility and the financial performance of South African listed companies. In order to investigate the problem it was necessary to perform a review of the related literature (chapter 2). In chapter 3 the sub-problem relating to how environmental responsibility of companies should be determined and measured was addressed. The sub-problem relating to measures of financial performance was addressed in chapter 4. The research design and methodology was presented in chapter 5 and the analysis of the results in chapter 6.

The summaries and conclusions reached for the above-mentioned chapters are considered in this chapter in order to reach a final conclusion on the primary hypothesis that states that there is a positive relationship between the environmental responsibility and the financial performance of South African listed companies; i.e. the higher the environmental responsibility of a company is, the higher is the financial performance of that company.

7.2 REVIEW OF THE RELATED LITERATURE

A theoretical foundation for environmental reporting can be identified in the accounting definitions as well as in AC 000, *Framework for the preparation and presentation of financial statements*. Environmental events have proven to have a financial character, especially through claims against enterprises. Stakeholders require accountability with regard to environmental performance in order to make economic decisions.

Conventional accounting does not meet all the expectations of stakeholders regarding environmental reporting. The upward trend in environmental costs has led to a push for better environmental accounting. Enterprises that have learned more about their own costs by implementing environmental accounting practices, have identified opportunities to improve environmental and economic performance.

Conventional accounting is developing to include environmental considerations. However, this evolutionary process will not be enough to be fully responsive to the change in culture that comes with greater environmental sensitivity and therefore totally new developments are also necessary.

The following stakeholders are interested in environmental reporting:

- Society
- Governments and their agencies
- Local communities
- Customers
- Suppliers and other trading partners
- Employees
- Investors, lenders and insurers
- Accountants and auditors.

Over time, new social expectations arise and new activities are seen as being socially desirable. Society is placing increasing emphasis on the importance of the environment and managing the environment in a more responsible manner.

Greening social conscience and changing social expectations have been translated into more stringent environmental laws. At present South Africa does not have such stringent laws as for example the United States. The South African government has realized some of the limitations of existing legislation and is taking

steps to remedy the situation. The mining sector has recently felt the effect of South African environmental law moving in the direction of international environmental law. The National Water Act 36 of 1998 applies the polluter pays principle. The mining sector are now required to compete on an equal legal footing with other interests when it comes to demands placed on the use of the country's water, land or mineral resources.

Local communities demand a high level of environmental performance from its industrial neighbours and seek some degree of reassurance that they are not exposed to significant environmental risk.

Customers have a definite influence on companies to improve their environmental performance. "Green consumers" are now switching from brand loyalty to company loyalty. Companies are motivated by an enhancement of their competitive position to improve their environmental performance.

In efforts to improve overall environmental performance, many companies are exercising their own rights both as purchasers and as vendors and are demanding that all of the companies within their supply chain seek to minimize their own environmental impacts. It is important for South African exporters to adhere to environmental standards to gain access to international markets.

Employees wish to work for ethical and responsible companies in addition to their concerns regarding their own working and living environment.

Investors, lenders and insurers require very much the same type of information about the environmental risk that a company faces. The quality of a company's environmental management can attract investors, move lenders to grant loans and ensure that insurance can be obtained.

Accountants and auditors are coming under increasing pressure to include environmental information in the accounts of both companies and countries. The accounting profession is showing a great deal of energy and creativity in trying to

make financial accounting better reflect the sorts of environmental realities that already or may soon affect business. Accountants and auditors who fail to offer the right information now may in future have to pay for their mistakes.

The costs of environmental responsibility may arise when an environmentally responsible company exceeds regulatory compliance. One of the biggest risks involved with this strategy is the possibility of more efficient and/or cheaper technology being introduced after the company undertakes a large outlay of funds for equipment. Another possibility is that regulations do not become more stringent and/or the benefits of cheaper daily operations do not exceed the outlay.

The benefits of environmental responsibility include a decrease in the cost of operations due to improved production yields, decrease in costs associated with employees, minimization of material and energy use, decrease in excess packaging, and decrease in waste that needs safe disposal.

Enhanced revenues via environmental responsibility may be achieved through improved competitiveness, improved product quality, marketing based on environmental responsibility, attracting business partners relating to distribution and supply of complementary products or services as well as attracting more competent board members. Another way that the environmentally responsible company may prosper is through the reduction of its cost of capital while simultaneously increasing its accessibility to funds.

An environmentally responsible company has less regulatory risks and need not be concerned about non-compliance resulting in lost production, fines, negative publicity, a subsequent costly public relations campaign and expensive litigation. New regulations could force competitors to bear additional costs that may lead to their decline in the market.

Previous studies that examined the relationship between environmental performance and financial performance have inconsistent results. Reasons offered by Ullmann (1985) are a lack in theory, inappropriate definition of key

terms, and deficiencies in the available empirical data bases. Belkaoui & Karpik (1989) suggested that a multicollinearity effect may explain the observance in other studies of either positive, negative or no correlation of financial performance with social disclosure. According to Allen (1994) results of previous research have been mixed due to short time intervals studied, lack of control variables and questionable or insufficient dependent variables. According to Klassen (1995) efforts to evaluate performance at firm level suffer from a limited view of both environmental performance and business performance. Based on the studies performed since 1972 to 1996 the final conclusion regarding the relationship between environmental responsibility and financial performance still seems evasive.

7.3 ENVIRONMENTAL RESPONSIBILITY

The related problems of a growing world population, depletion of natural resources and pollution have led to an ecological crisis that is endangering natural systems of which humans are part. The traditional Western view of life is founded in the assumptions that humans have the obligation to master and manipulate nature to their benefit and that the natural environment has unlimited possibilities for exploitation. There appears to be a paradigm shift from the traditional Western view of life to an environment-focused view. According to the new paradigm there are ecological limitations for humans relating to use of natural resources, pollution and population growth.

Environmental responsibility is not easy to define due to diverse interpretations of the principle. The classical model, the neo-classical model and the sustainable development model can be identified. The classical model incorporates legal constraints while the neo-classical model includes moral constraints as part of its limits. The neo-classical model may be criticized for its continued reliance on consumer demand in setting environmental limits to business conduct. Unconstrained demand will not resolve the dilemma created by poverty, population growth, and environmental destruction. The sustainable development model

seeks to combine the natural constraints established by ecological laws with minimal moral constraints placed upon business activity.

The now widely accepted general standard of environmental soundness is “sustainability” defined by the World Commission on Environment and Development (1987) as “to meet the needs of the present without compromising the ability of the future generations to meet their own needs”. Environmental responsibility manifests itself in a strategy that the management of a company decides to follow relating to the level of environmental performance it wishes to attain; the levels ranging from mere compliance with legal requirements to following sustainable development principles.

Increasing pressures on companies and their employees to be environmentally responsible have led to considerable progress by companies in the area of environmental responsibility. Business has realized that it is both a major cause of environmental problems, and their main source of solutions. Multinational corporations have gone through a dramatic transformation in their approaches to environmental protection: From avoiding compliance with regulatory controls during the 1960s and 1970s to reacting to regulatory requirements and attempting to minimize the costs of compliance during the 1980s to taking control of their environmental problems and even turning them into competitive opportunities during the 1990s.

Companies make use of the following concepts in their quest to be environmentally responsible:

- Environmental management systems and environmental audits;
- environmental risk assessment;
- environmental reporting;
- full-cost environmental accounting;
- total quality management;
- pollution prevention;

- demand-side management;
- design for environment;
- product stewardship;
- clean technology;
- responsible care;
- green alliance.

Abbott & Monsen (1979) attempted to develop a social involvement disclosure scale based on a content analysis of annual reports. They found that the self-reported social disclosure method of measuring corporate social involvement, despite its own drawbacks, has significant advantages as a technique for measuring corporate social responsibility.

Ingram & Frasier (1980) used content analysis to measure the content of each firm's environmental disclosures. Their methodology of content analysis involved the selection of analytical categories within the content material.

Wiseman (1982) constructed an indexing procedure similar to the ones used by Buzby (1974) and Singhvi & Desai (1971) for evaluations of corporate disclosure in annual reports to evaluate the contents of the annual report environmental disclosures. Rating of the disclosures was based on the presence or absence and the degree of specificity of each of the information items.

Van Niekerk (1998) considered the methods of work of researchers who wanted to judge the information in annual financial statements objectively, including that of Ingram & Frasier, and Wiseman. She compiled a control list based on a control list developed by Bogiages & Vorster (1993) to evaluate the environmental information that companies disclose in their annual financial statements. Van Niekerk developed a scale to judge the quality of the environmental information that was gathered by using the control list.

7.4 FINANCIAL PERFORMANCE

Profitability is a key component of financial performance. From management's point of view profitability is the effectiveness with which management has employed both the total assets and the net assets as recorded on the balance sheet. The effectiveness is judged by relating net profit to the assets utilized in generating the profit. From the owners' point of view (the shareholders in the case of a company) profitability means the returns achieved through the efforts of management on the funds invested by the owners.

Once market share was the best predictor and guarantor of profitability. However, in the last decade the classic rules of strategy have broken down in a fundamental way. Large, well-known companies succeeded fantastically in winning market-share but did not enjoy the profitability that was supposed to follow. In recent years several of these companies have reversed their strategic thinking about market share and profitability and initiated radical changes in their business designs, achieving in the process some of the success that had been eluding them.

Success in today's marketplace depends on how profit is really made in an industry, where the "profit zone" is (that area within a specific industry in which profit is allowed), and how the business model should be designed in order to reach and operate in the profit zone. Profitability must be understood for each company in its own terms. Companies who have become almost habitually customer-centric and profit-centric are known as "reinventors". They change their business design every five years and expect that process to continue.

A variety of key factors, drawn from several research traditions, seem to work together to produce better-than-average performance. Elements of environment, strategy and organization (can be divided into structure and climate or culture) are important in explaining differences in financial performance. Environment and strategy variables dominate in strength of impact, with strategy providing the most

consistent effects. The following causal factors stand out in terms of the consistency with which they affect alternative measures of performance:

- Competing in relatively concentrated markets with high market share (environment);
- competing in growing markets (environment);
- high investment in research and development, especially for developing new products and services (strategy);
- high involvement in markets outside of the U.S. (strategy);
- low debt levels (strategy); and
- an entrepreneurial atmosphere (organization) that supports a strategy of innovation.

Measures of financial performance take a variety of forms. These measures differ from each other on several dimensions, and many issues concern the choice of which particular financial measure to employ. For example, measures may be absolute, return-based, internal, external, a level for a single period, a mean or a growth rate over several years, or a variability about a mean or a trend.

The following measures are often used to measure financial performance and were considered in determining the most appropriate measures of financial performance for the purposes of this study:

- Profit margin
- Return on assets
- Return on equity
- Earnings per share
- Price/Earnings ratio
- Excess value
- Return on capital

- Economic value added

7.5 RESEARCH DESIGN AND METHODOLOGY

For the purposes of this study annual financial statements for the periods ending from 1994 to 1998 were investigated. Only listed companies were included as their published annual financial statements are freely available. Only companies listed on the JSE during the calendar years 1994, 1995, 1996, 1997, and 1998 were included, provided they were still listed at the time of selection. The investigation was not limited to certain sectors of the JSE in order to include all possible environmentally responsible companies.

The control list and the judgement scale used by Van Niekerk (1998) are objective measures developed from previous empirical research and were selected for use in this study to determine environmentally responsible companies. The Department of Accounting & Finance of the University of Pretoria provided the data for the environmental responsibility measure expressed as points after the judgement scale had been applied to the information collected by means of the control list. The points per company were divided by the total possible points to calculate an environmental reporting percentage. The environmental reporting percentage of each company is used as the indicator of that company's level of environmental responsibility.

An advantage of using more than one measure of financial performance is that the different measures can serve to validate each other. The following measures of financial performance were selected for purposes of this study:

- Return on equity (ROE);
- return on assets (ROA);
- return on capital (ROC);and
- economic value added (EVA)

Reasons for selecting these measures are as follows:

- The performance measure used most by studies using accounting numbers is ROE. Eighty percent of the studies that used accounting numbers selected ROE as a measure.
- Sixty percent of the studies that used accounting numbers selected ROA. Almost all the studies since the mid-eighties included ROA as a performance measure.
- ROC was not used that often by previous studies. However, it is regarded as a very important performance measure by Stewart (1990) (refer to section 4.4.8) who suggested the use of EVA to improve on ROC.
- EVA is selected since this measure incorporates a long-term view, inherently incorporates risk and is not susceptible to the accounting and financing distortions of all other measures of profitability.

The BFA provided the data for the financial performance measures. Data for the ROE, ROA, and ROC ratios were obtained from the standard BFA ratio service. The BFA specifically calculated EVA for the purposes of this study.

The Department of Statistics of the University of Pretoria performed the correlation analyses for the purposes of this study. The purpose of the correlation analyses was to determine whether a correlation exists between the environmental reporting percentages (resulting measure of environmental responsibility) and the financial performance measure and what the nature of the correlation is.

Correlation analyses were performed for the following groups of companies for every year from 1994 to 1998:

- The total qualifying population of companies;
- the total population excluding wild points regarding environmental reporting percentages; and
- companies reporting on environmental matters during four to five years of the period of the study.

To qualify for the correlation analyses a company needed an environmental reporting percentage as well as a financial performance measure in the same year. The financial performance measures ROE, ROA, and ROC were individually correlated with the environmental reporting percentages for all the companies, regardless of the JSE sector of the companies. The correlation of EVA with the environmental reporting percentages was limited to industrial companies as EVA was only calculated for industrial companies (refer to section 5.5.2).

Previous research did not establish causality between environmental responsibility and financial performance. The possibility to use the Granger causality test for purposes of this study was investigated. It was found that the Granger causality test could not be used for purposes of this study due to the limited environmental reporting percentages available per company.

Correlation analyses per sector were meaningless as a consequence of the limited number of observations per sector. Analyses per sector were performed by way of the following trend analyses for every year from 1994 to 1998:

- Environmental responsibility per sector;
- average financial performance for environmentally responsible companies in comparison to average financial performance for companies without an environmental responsibility measure per sector; and
- data plots.

7.6 ANALYSIS OF RESULTS

The results of the correlation analyses between ERP and ROE, ROA and ROC respectively indicate that a small positive correlation exists between environmental responsibility and financial performance. The financial performance of a company is higher where the environmental responsibility is higher. However, the positive correlation coefficients are small. This means that the evidence supporting the hypothesis of “the higher the environmental responsibility of a company is, the higher is the financial performance” is not very strong.

The results of the correlation analyses between ERP and EVA indicate that a small negative correlation exists between environmental responsibility and financial performance. The financial performance of a company is lower where the environmental responsibility is higher. However, the negative correlation coefficients weakened from 1995 to 1996 and again in 1997. The result of the correlation analysis between ERP and EVA for 1998 indicated that no correlation exists between environmental responsibility and financial performance. Therefore it is concluded that the negative correlation between environmental responsibility and financial performance reduced every year from 1995 to 1997 to eventually no correlation in 1998. The EVA analyses were only performed for industrial companies.

The results of the correlation analyses are in line with previous research results. Allen (1994) found that adopting an environmentally responsible strategy significantly enhanced corporate financial performance for all firms except those serving *industrial* customers. Firms supplying industrial customers seemed to be benefiting financially from a strategy of environmental indifference or irresponsibility. Hart & Ahuja (1994), Klassen & McLaughlin (1995) and the IRRC (1995) also found a positive correlation between increased environmental performance and improved financial performance.

However, the South African study of Huckle (1995) found that the profitability of a company in the industrial or mining sectors of the JSE is unrelated to the level of environmental responsibility demonstrated by that company. Reasons why the results of this research are not in line with Huckle's finding are as follows:

- Huckle's study was limited to industrial and mining companies, while this study included all companies listed on the JSE. Where the EVA analyses limited this study to industrial companies the result was a negative correlation that means that the financial performance of a company is lower where the environmental responsibility is higher, especially in 1995. The sector trend analyses for the mining sectors indicated a positive correlation, i.e. the financial performance of a company is higher where the environmental responsibility is higher. It is

possible that the negative element of the industrial companies cancelled the positive element of the mining companies in the combined correlation analysis of Huckle.

- Huckle (1995: 83-84) stated that the goal of profitability would be achieved through efforts in areas other than environmental responsibility until environmental legislation becomes more sophisticated and provides strong financial motivation for companies to behave in an “environmentally correct” manner. His opinion was that if such a change in legislative philosophy occurred, a relationship between environmental responsibility and profitability would be more readily established. South Africa is following the international trend to improve environmental legislation. The government recognized the limitations of existing legislation in the White Paper on the Conservation and Sustainable Use of South Africa’s Biological Diversity (1997). The National Water Act 36 of 1998 is an example of stricter South African legislation that clearly includes the polluter pays principle as established under the Superfund Act of the United States.

The individual sectors were examined for trends relating to environmental responsibility and financial performance. In order to select sectors for the average financial performance analysis, the environmental responsibility per sector was investigated.

Of the 41 sectors considered from 1994 to 1998, five sectors do not have environmental reporting percentages (ERP’s) or other evidence relating to environmental responsibility, 16 have little evidence of environmental responsibility, nine sectors have reasonable evidence of environmental responsibility and 11 sectors have good evidence of environmental responsibility. It is encouraging to note that 36 of the 41 sectors have given attention to environmental responsibility by way of environmental reporting. However, less than half of the sectors achieved reasonable or good evidence of environmental reporting.

The outstanding sectors identified were the mining-related sectors (coal, diamonds, gold, platinum, metals & minerals, and mining holding & houses), the steel sector, the paper sector, and the chemical, oils & plastics sector. The food sector and the building, construction & engineering sector also performed well, although their average ERP's are not as high as for the outstanding sectors.

Almost all of the sectors for which environmental responsibility resulted in an advantage relating to financial performance, experience stakeholder pressure, especially from environmental legislation and the green consumer. Whatever the motivation of the companies in these sectors to be environmentally responsible, these companies have better financial performance than the companies in the same sectors that chose not to be environmentally responsible (as evidenced by the disclosure of environmental matters in their annual financial statements). It is possible that the companies that have chosen to be environmentally responsible have reaped the benefits of environmental responsibility. Allen (1994) found that enhanced financial performance of environmentally responsible firms appears to be attributable to stakeholder-agency considerations.

The sectors for which environmental responsibility resulted in a disadvantage relating to financial performance are not subject to the same level of stakeholder pressure than the sectors for which environmental responsibility is an advantage. These sectors do not appear to have such a direct impact on the environment or on the consumer. Environmental legislation does not really affect these sectors, therefore the companies that spend money to be environmentally responsible have a poorer financial performance. However, this is probably a short-term phenomenon, as the environmentally responsible companies in these sectors will adjust easier to stricter environmental legislation that is probable in future, while the other companies would have to incur more costs to become compliant.

Of the 41 sectors considered from 1994 to 1998, environmental responsibility resulted in an advantage relating to financial performance for 13 sectors (six with good, six with reasonable and one with little evidence of environmental responsibility). For five sectors with good environmental responsibility and one

with reasonable environmental responsibility no trends were clear or insufficient information was available. For four sectors (two with reasonable and two with little evidence of environmental responsibility) environmental responsibility resulted in a disadvantage relating to financial performance. For three sectors with little evidence of environmental responsibility no trends were clear or insufficient information was available. For the remaining 15 sectors no average financial performance trend analysis or data plots were prepared due to no or very little evidence of environmental responsibility.

7.7 FINAL SUMMARY AND CONCLUSIONS

The problem under investigation in this study is whether there is a positive relationship between the environmental responsibility and the financial performance of South African listed companies. After performing a review of the related literature, the following sub-problems were addressed:

- How should environmental responsibility of companies be determined and measured?
- What measures of financial performance should be used?
- How should the relationship between environmental responsibility and financial performance of South African companies be determined?

From the review of the related literature the stakeholders interested in environmental reporting were identified as society; governments and their agencies; local communities; customers; suppliers and other trading partners; employees; investors, lenders and insurers as well as accountants and auditors.

These stakeholders are placing increasing pressure on companies to be environmentally responsible. Pressures to be environmentally responsible include the following:

- Society is placing increasing emphasis on the importance of the environment.

- Internationally, as well as in South Africa, there are moves towards stricter (e.g. the polluter pays principle) and even retrospective environmental legislation. Laws that allow criminal action against individuals put pressure on senior executives to take responsibility for their company's actions.
- Local communities seek some degree of reassurance that they are not exposed to significant environmental risk due to a company's operations.
- Environmental performance constitute one positive element among the many characteristics upon which customers base their purchasing decision. "Green consumerism" is switching from brand loyalty to company loyalty.
- South Africa's foreign trade partners are using environmental standards to generate trade barriers. European businesses have a growing sensitivity to competition from developing countries that they perceive to be unregulated.
- Employees wish to work for ethical and responsible companies.
- Many investors only want to lend their financial support to companies that behave in an environmentally responsible manner. Banks increasingly require of companies to provide environmental assessments before they will grant a loan. It is increasingly difficult and expensive to obtain insurance cover against causing environmental damage.
- Accountants and auditors are increasing awareness by selling advice on e.g. mergers and acquisitions work where environmental issues might affect the future profitability of businesses; valuations of land and capital equipment that might become obsolete faster than expected when environmental regulations or market demand change; or environmental performance reports.

Companies have gone through a dramatic transformation in their approach to environmental responsibility. They avoided compliance with regulatory controls during the 1960s and 1970s, reacted to regulatory requirements and attempted to

minimize the costs of compliance during the 1980s, took control of their environmental problems and even turned them into competitive opportunities during the 1990s. The progress made by such companies included various areas.

The benefits of environmental responsibility lie in the following:

- A decrease in cost of operations, e.g. by using recycled items as inputs, decreasing excess packaging.
- Enhanced revenues, e.g. able to attract a growing segment of the world population that is demanding environmentally friendly products.
- A decrease in cost of capital, e.g. a more environmentally responsible firm will receive a higher credit rating.
- A decrease in regulatory risks, e.g. an environmentally responsible company will adapt easy to new legislation while competitors will have to bear the additional costs of complying.

The disadvantage of environmental responsibility occurs when a company chooses to exceed regulatory compliance and more efficient and/or cheaper technology is introduced after the company has invested in a large outlay of funds for equipment. Competitors that chose to merely comply are producing a product that is cheaper to manufacture.

After considering previous research relating to measures of environmental responsibility, the control list and the judgement scale used by Van Niekerk (1998) were selected for use in this study to determine environmentally responsible companies as they are objective measures developed from previous empirical research. The environmental responsibility measure was expressed as points after the judgement scale had been applied to the information collected by means of the control list. The points per company were divided by the total possible points to calculate an environmental reporting percentage. The environmental reporting

percentage of each company was used as the indicator of that company's level of environmental responsibility.

Financial performance measures often used were considered before selecting the following measures of financial performance for purposes of this study:

- Return on equity (ROE);
- return on assets (ROA);
- return on capital (ROC);and
- economic value added (EVA)

Reasons for selecting these measures are as follows:

- The performance measure used most by studies using accounting numbers is ROE. Eighty percent of the studies that used accounting numbers selected ROE as a measure.
- Sixty percent of the studies that used accounting numbers selected ROA. Almost all the studies since the mid-eighties included ROA as a performance measure.
- ROC was not used that often by previous studies. However, it is regarded as a very important performance measure by Stewart (1990) (refer to section 4.4.8) who suggested the use of EVA to improve on ROC.
- EVA is selected since this measure incorporates a long-term view, inherently incorporates risk and is not susceptible to the accounting and financing distortions of all other measures of profitability. EVA considers the cost of all capital and corrects for potential distortions caused by generally accepted accounting principles.

The price/earnings (P/E) ratio was considered, but was not selected due to the following:

- Previous researchers that examined the relationship between environmental performance and financial performance did not prefer the

P/E ratio. Profitability ratios (a financial return off an investment base) were chosen in all of the studies that used accounting numbers. These researchers tried to establish the true financial performance (profitability) of the companies researched and not how the stock market is judging a company's earnings performance and prospects. Only one of the early researchers studied the movement in the P/E ratio in addition to the chosen profitability ratio.

- Numerous events and perceptions in the market could affect the P/E ratio. Most of the studies that used stock market measures attempted to relate specific environmental events to abnormal returns.

In order to determine the relationship between environmental responsibility and financial performance correlation analyses were performed for the following groups of companies for every year from 1994 to 1998:

- The total qualifying population of companies;
- the total population excluding wild points regarding environmental reporting percentages; and
- companies reporting on environmental matters during four to five years of the period of the study.

To qualify for the correlation analyses a company needed an environmental reporting percentage as well as a financial performance measure in the same year. The financial performance measures ROE, ROA, ROC and EVA were individually correlated with the environmental reporting percentages for all the companies, regardless of the JSE sector of the companies.

The results of the correlation analyses between ERP and ROE, ROA and ROC respectively indicate that a small positive correlation exists between environmental responsibility and financial performance. However, the positive correlation coefficients are small. This means that the evidence supporting the hypotheses is not very strong. The following secondary hypotheses have been supported:

- The higher the environmental reporting percentage of a company is, the higher is the return on equity of that company.
- The higher the environmental reporting percentage of a company is, the higher is the return on assets of that company.
- The higher the environmental reporting percentage of a company is, the higher is the return on capital of that company.

The results of the correlation analyses between ERP and EVA indicate that a small negative correlation exists between environmental responsibility and financial performance. The secondary hypothesis stating that “The higher the environmental reporting percentage of a company is, the higher is the economic value added (EVA) of that company” has not been supported. The higher the environmental reporting percentage of a company is, the lower is the EVA of that company. However, the negative correlation coefficients weakened from 1995 to 1996 and again in 1997. The result of the correlation analysis between ERP and EVA for 1998 indicated that no correlation exists between environmental responsibility and financial performance. Therefore it is concluded that the negative correlation between environmental responsibility and financial performance reduced every year from 1995 to 1997 to eventually no correlation in 1998.

The results of the correlation analyses between ERP and EVA does not contradict the results of the correlation analyses between ERP and ROE, ROA and ROC respectively if it is taken into account that EVA was only calculated for industrial companies, whereas ROE, ROA and ROC were calculated for all listed companies. This means that the mining companies that have high environmental reporting percentages as well as high profit were excluded from the EVA correlation analyses. It is possible that negative correlation coefficients resulted due to the reduction of the profit for the purposes of calculating EVA by an inflation adjustment as well as by the incorporation of risk.

The results of the correlation analyses are in line with previous research results. Allen (1994) found that adopting an environmentally responsible strategy significantly enhanced corporate financial performance for all firms except those serving *industrial* customers. Firms supplying industrial customers seemed to be benefiting financially from a strategy of environmental indifference or irresponsibility.

The results of the correlation analyses supported three of the four secondary hypotheses and therefore also the primary hypothesis that states: "There is a positive relationship between the environmental responsibility and the financial performance of South African listed companies; i.e. the higher the environmental responsibility of a company is, the higher is the financial performance of that company." However, the evidence supporting the hypotheses is not very strong as indicated by the small positive correlation coefficients. This made it necessary to examine the individual sectors for trends relating to environmental responsibility and financial performance.

Correlation analyses per sector were meaningless as a consequence of the limited number of observations per sector. Analyses per sector were performed by way of the following trend analyses for every year from 1994 to 1998:

- Environmental responsibility per sector;
- average financial performance for environmentally responsible companies in comparison to average financial performance for companies without an environmental responsibility measure per sector; and
- data plots.

The sector trend analyses provided limited support for the primary hypothesis by supporting the following secondary hypothesis: "The average financial performance measures are higher for the group of companies in a sector that are environmentally responsible (companies with environmental reporting percentages) than for the group of companies without environmental reporting percentages."

Of the 41 sectors considered from 1994 to 1998, environmental responsibility resulted in an advantage relating to financial performance for 13 sectors (six with good, six with reasonable and one with little evidence of environmental responsibility). For nine sectors no trends were clear or insufficient information was available (five sectors with good environmental responsibility, one with reasonable environmental responsibility and three with little evidence of environmental responsibility.) For four sectors (two with reasonable and two with little evidence of environmental responsibility) environmental responsibility resulted in a disadvantage relating to financial performance. For the remaining 15 sectors no average financial performance trend analysis or data plots were prepared due to no or very little evidence of environmental responsibility.

If the sectors with no or very little evidence of environmental responsibility become more environmentally responsible in future and report on environmental matters in their annual financial statements, it would assist future researchers to establish the relationship between environmental responsibility and financial performance more accurately.

There is a positive relationship between the environmental responsibility and the financial performance of South African listed companies; i.e. the higher the environmental responsibility of a company is, the higher is the financial performance of that company. Although the evidence supporting the above-mentioned primary hypothesis is not very strong, it is clear that the correlation analyses as well as the sector trend analyses indicated that the hypothesis is true. However, it is important to note that this conclusion is based on the results in total. As was noted above there are still many sectors with no or very little evidence of environmental responsibility.

This is the first South African study that concludes that there is a positive relationship between environmental responsibility and financial performance of a company. The South African study of Huckle (1995) found that the profitability of a company in the industrial or mining sectors of the JSE is unrelated to the level of environmental responsibility demonstrated by that company. His opinion was that

if such a change in legislative philosophy occurred, a relationship between environmental responsibility and profitability would be more readily established. There is evidence that South Africa is following the international trend to improve environmental legislation. This improvement in legislative philosophy contributed to the finding of this study.

The expectation at the commencement of this study was that higher environmental responsibility would contribute to higher financial performance mainly due to cost savings (inefficiencies eliminated), higher revenue (with the support of consumers demanding environmental responsibility) and lower environmental risk (no claims or fines because of environmental disaster). The conclusion reached is that the higher the environmental responsibility of a company is, the higher is the financial performance of that company (refer above).

However, causality (cause-and-effect) could not be addressed due to insufficient environmental information available (not enough periods of environmental reporting). Consequently no formal deduction can be made that higher environmental responsibility contributes to higher financial performance. This does not rule out the possibility that it is true. Similar to this study, studies by the IRRC as well as Hart and Ahuja in the USA (refer to section 2.5) noted that although a correlation was found between increased eco-efficiency and improved financial results, causality was not proved. Hart and Ahuja were of the opinion that a "virtuous circle" exists; i.e. companies can realize cost savings from emission reduction projects and plough those savings back into other projects.

The number of listed companies reporting on environmental matters in their annual reports are increasing annually. There is a growing awareness under companies that something should be done about environmental responsibility. Many companies do not disclose sufficient information, especially financial information, about their environmental activities. Some companies are environmentally responsible, e.g. as evidenced by their involvement in environmental projects, but do not disclose any information about it in their annual reports.

There is a legitimacy problem when environmental information is disclosed. There is often a poor relationship between the environmental reporting and the actual environmental performance. It is extremely difficult to verify the environmental reporting to the actual environmental performance. Many companies perceive that it is good for the image to report on environmental matters – the result is a marketing message as opposed to reporting on actual environmental matters.

In the absence of a conclusion that higher environmental responsibility contributes to higher financial performance (causality), it may be argued that more profitable companies can afford to invest in environmentally responsible activities. This could explain the conclusion reached that the higher the environmental responsibility of a company is, the higher is the financial performance of that company (refer above). It is possible that where companies are reporting on environmental matters purely to built image, it would be the companies who can afford it.

However, industrialized countries are experiencing a paradigm shift since the late 1980s from the traditional Western view of life, assuming that the natural environment has unlimited possibilities for exploitation, to a new paradigm that states that there are ecological limitations for humans relating to use of natural resources, pollution and population growth. The widely accepted general standard of environmental soundness is “sustainability” defined by the World Commission on Environment and Development (1987) as “to meet the needs of the present without compromising the ability of the future generations to meet their own needs”.

Internationally corporate environmental management changed dramatically during the 1990s when companies started to take control of their environmental problems and turned them into competitive opportunities. Companies use environmental management systems, environmental audits, environmental risk assessment and total quality management techniques to manage their environmental responsibility. Companies benefit from pollution prevention strategies, demand-side management, design for environment, product stewardship, clean technology

development, responsible care initiative (chemical industry) and “green alliance” partnerships as these concepts are planned for from the initial stages of development of a product.

South Africa has not been unaffected by the paradigm shift described above. This is evidenced by the recent improvements in South African environmental legislation. South African companies also have to comply with the environmental requirements of countries to which they export or face trade barriers. During the period of this study the number of listed companies reporting on environmental matters increased every year, following the international trend.

7.8 SUGGESTIONS FOR FUTURE RESEARCH

The following areas relating to the relationship between environmental responsibility and financial performance were identified for future research:

- This study can be repeated in a few years time when more data should be available. Although the study covered a five-year period the limited number of companies that reported on environmental matters in 1994 hampered the correlation analyses. The companies that reported on environmental matters increased from 42 in 1994 to 162 in 1998 for the correlation analysis between ERP and ROE. If the number of companies who report on environmental matters continues to increase, the evidence of environmental responsibility per sector should also improve. This improvement could contribute to a more meaningful analysis per sector.
- This study as well as previous studies could not establish causality between environmental responsibility and financial performance. The Granger causality test was considered but could not be used, as at least 20 environmental reporting percentages per company are required. Only one percentage per annum per company is calculated. Causality (using the Granger test) can be addressed in about 15 years. Other methods to establish causality should also be investigated.
- This study identified ROE, ROA, ROC and EVA as financial performance

measures (referred to as “accounting numbers” in the literature review). Future research can identify stock market measures for SA listed companies and relate them to environmental events.

- Environmental responsibility manifests itself in a strategy that the management of a company decides to follow relating to the level of environmental performance it wishes to attain; the levels ranging from mere compliance with legal requirements to following sustainable development principles. Future research can investigate how environmental performance levels should be determined to establish actual environmental responsibility, improving on basing environmental responsibility on a company’s reporting on environmental matters in its annual financial statements.
- This study included only listed companies. Future research can include unlisted public companies, private companies, close corporations and public entities.
- The impact of being environmentally responsible on the financial performance of individual companies can be studied over a number of years. Comparatively the impact of ignoring environmental responsibility by individual companies should be studied over the same period.
- Future research can investigate ways to determine actual environmental responsibility of a company (have a peep behind the scenes) that can be related to what is reported on the topic.
- This study used only the published annual reports of listed companies. An increasing number of companies periodically publish separate environmental reports or make environmental information available on their websites. Future research can include information from such environmental reports or websites.