FINANCIAL PERFORMANCE OF ENVIRONMENTALLY RESPONSIBLE SOUTH AFRICAN LISTED COMPANIES

by

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FINANCIAL PERFORMANCE OF ENVIRONMENTALLY RESPONSIBLE SOUTH AFRICAN LISTED COMPANIES

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The purpose of this study was to investigate whether there is a positive relationship between environmental responsibility and financial performance of South African listed companies.

For the purposes of this study annual financial statements for the periods ending from 1994 to 1998 were investigated. Only companies listed on the Johannesburg Stock Exchange (JSE) during the calendar years 1994 to 1998 were included. The investigation was not limited to certain sectors of the JSE in order to include all possible environmentally responsible companies.

In the review of the related literature the theoretical foundation of environmental reporting was investigated based on fundamental accounting principles. The stakeholders interested in environmental reporting were identified and their influence on the environmental information presented in annual financial statements was

examined. The costs or disadvantages versus the benefits or advantages of environmental responsibility were explored. The findings of previous studies that examined the relationship between environmental performance and financial performance were investigated.

Environmental responsibility was defined, taking previous researchers' definitions into consideration. Pressures towards environmental responsibility that companies experience and progress made by companies were discussed. Previous studies were used to identify the most appropriate measures to use when measuring environmental responsibility. A control list and a judgement scale developed from previous research were selected for use in this study to determine environmentally responsible companies.

Profitability, as a key component of financial performance, was defined. Elements of financial performance were discussed under the profit zone and causal factors. Financial performance measures most often used were identified from relevant literature. These measures were considered as well as measures used in previous research before selecting return on equity, return on assets, return on capital and economic value added for purposes of this study.

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

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

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.

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 a environmental responsibility measure per sector; and
- data plots.

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, it is important to note that this conclusion is based on the results in total and that causality could not be addressed. There are still many sectors with no or very little evidence of environmental responsibility.

CHAPTER 1

INTRODUCTION AND PROBLEM STATEMENT

1.1 INTRODUCTION AND BACKGROUND

For centuries business was done without consideration for the environment. This resulted in damage to the natural resources. According to Welford & Gouldson (1993: 1) environmental issues have been a matter of public concern for over a quarter of a century. As knowledge relating to the cause and effect of environmental damage has become more complete, the pressure to change the ways in which we behave has increased. Much of this pressure has been targeted towards industry, which is often identified as the major source of pollution.

These days, companies have to respond to a wide range of environmental pressures. Consumers, prompted by environmental labelling, are exerting pressure through the marketplace, while environmental liability keeps investors interested. (Ward 1993:18). Companies operating in Europe are under increasing pressure to take their environmental responsibilities seriously. The European Union and individual member states are introducing tougher environmental regulations. Environmental groups, in their campaign for a cleaner, safer world, continue to uncover and publicise foul deeds. Failure to respond to the pressure could result in legal action, bad publicity, loss of market share, loss of investor confidence, the wrath of the local community and even jail for senior managers. (Fuller, Palframan & Tank 1995: 9.)

Environmental concerns have the capacity to affect both the short-run and long-term health of each firm. While this is particularly true with regard to those firms in heavy pollution industries, no firm or industry is immune from environmental risk. (Allen 1994: 1.)

During the 1970s and 1980s, the environmental disasters of Bhopal, Chernobyl, and the Exxon Valdez captured the public's attention. However, the environmental damage caused by headline catastrophes is small compared to the daily damage that society causes and that ecologically sound business practices can reduce. (Willits & Metil 1996: 28.)

Traditionally, environmental issues and concerns have been viewed as a constraint to businesses. This has resulted in environmental managers relying heavily on a reactive, compliance-based approach to justify change. Businesses are now recognising that efficient management in the environmental arena can benefit the entire company and open new opportunities for increased profits. (Metcalf, Williams, Minter & Hobson 1996: 7.)

According to David Davies, chairman of the UK's Advisory Committee on Business and the Environment, many businesses are finding that environmental attention brings rewards. Such rewards can derive from increased competitiveness through improved profitability, from "licenses to operate", whether from inclusion on important customers' lists of approved suppliers, or literally, from the regulatory agencies, and from a generally enhanced corporate image. (Jones 1996: 54.)

Competitiveness in the global marketplace increasingly depends on demonstrating effective environmental management and product design to purchasers of products and services, whether those buyers are secondary manufacturers, retailers, government agencies, or consumers. One key to future marketplace success, therefore, lies in developing mechanisms to evaluate environmental impacts, implement improvement strategies, and communicate environmental performance and improvements to stakeholder audiences. Companies stand to gain from these actions in real financial terms – through improved production and operating efficiencies, reduced liability exposure, enhanced customer relations, and increased business opportunities. (Brown, Ward & Titus 1996: 3.)

Environmental standards are the result of public concern over the impact industry has on the environment – both locally and globally. The general public is

demanding that companies all over the world take responsibility for their actions. ISO 14000 is an attempt to harmonise the environmental requirements for all industries throughout the world. It is a voluntary standard, but choosing not to meet the international standards may effectively create trade barriers. (Pratt 1997: 68.)

The International Standards Organisation (ISO) developed the ISO 9000 system to create a formal and consistent method of assessing standards in just about every aspect of business, from management to customer service and manufacturing. According to Kelvin Siu, controller for business development at the Hong Kong Quality Assurance Agency, many companies obtained ISO 9000 certification because they wanted to use it as a management tool to enhance efficiency. Others were forced to do it, but whether they got it voluntarily or under pressure from customers, they have found the value of ISO 9000: it can help achieve cost savings by reducing waste and the amount of re-working. While ISO 9000 took time to gain a foothold, ISO 14000 is likely to snowball as firms in the West respond to pressure from consumers to improve environmental standards. As major buyers embrace ISO 14000, they will demand that suppliers follow suit. (Parry 1996: 22.)

Organisations are developing a new green mentality. They are seeing green costs as investments that can eventually provide a profitable return. (Harrison 1993: 7). The new green mentality was initiated to a great extend by the Business Council on Sustainable Development (BCSD) with their 1992 manifesto “Changing Course”. Due to the credibility of the companies that constitute BCSD’s membership – including Dow Chemical, 3M, Northern Telecom, Ciba-Geigy, Volkswagen, Nissan, Mitsubishi, and many others – their message has had a substantial influence on the strategic thinking of company executives around the world. The BCSD’s concept of eco-efficiency suggests an important link between resource efficiency (which leads to productivity and profitability) and environmental responsibility. (Fiksel 1996: 47.)

According to Marc J. Epstein, author of “Measuring Corporate Environmental Performance – Best Practices for Costing and Managing Effective Environmental Strategy”, published by the Foundation for Applied Research, the research affiliate of the Institute of Management Accountants (in the USA), environmental reports in annual reports have increased tremendously. Three or four years ago there were not a dozen companies issuing separate environmental reports. Today at least half of the Fortune 500 companies are stating their position on the environment. These disclosures provide information on environmental liabilities, and, increasingly, evidence that corporate management is finding ways to increase profit by lessening environmental impact. (Cheney 1995: 12-14.)

In America the pressure for federal environmental regulations in the 1960s and 1970s came not just from green groups but from firms anxious that differing state rules were putting some of them at a competitive disadvantage. Now the same complaint is made on a global scale: many firms in countries where green rules are stringent say they will lose out unless poorer countries follow suit. In other words, even greenery’s most vigorous opponents now direct a lot of their energy towards trying to influence how laws are written rather than whether they are written at all. (Anonymous 1995: 66.)

The Financial Mail published a special report on environmental auditing during October 1992. From this report it is clear that South African businesses agree that environmental auditing can be beneficial to bottom-line profits and to the environment, if conducted proficiently and for the right reasons (McCallum 1992: 45). According to Di Soutter, partner in Strategic Environmental Audits, benefits of environmental management (including environmental auditing) can immediately offset the costs of implementing the system, depending upon the situation. She also said: “In the long-term the question should rather be whether the business will survive if it fails to manage environmental impacts. The fact of the matter is that we are at the start of an ‘environmental revolution’. Those businesses which do not react to the trend will ultimately be placed at a disadvantage, whether this be from a marketing or a legal standpoint.” (McCallum 1992: 51.)

In May 1997 the Mail and Guardian quoted Nicky Robins, environmental manager for Nissan SA, saying that business has recognised that environmental considerations are a strategic necessity in a global industrial market. She said that a shift has definitely taken place during the last five years. While it could be argued that companies have jumped on to the environmental bandwagon for marketing purposes, the reality of the situation is that any company exporting to industrialised markets and countries must improve its environmental performance. (Karras 1997: B5.)

Internationally the integration of environmental impact into management decisions is increasingly being regarded as good for society and good for business. Those companies that do not now begin this integration will not only incur higher costs, they will miss out on potential revenues and competitive advantage (Epstein 1996a: 58). South African business has realised the importance of environmental responsibility. This is evidenced by the trend towards more environmental reporting (De Villiers & Vorster 1997: 37). However, South African business has not yet reached the point where it is regarded as essential to integrate environmental considerations into everyday business.

1.2 PURPOSE AND IMPORTANCE OF THE STUDY

Most companies want to be seen as being environmentally responsible. Many companies have environmental management programmes in place, but the perception persisting is that looking after the environment does not pay corporate bills.

If it can be demonstrated that environmental responsible companies have higher financial performance (are more profitable) than companies not considering the environment, it would provide companies with a real incentive to be environmentally responsible. In the long-term the benefits of accepting environmental responsibility should be enormous for companies and the country as a whole.

1.3 DEFINITIONS

Eco-efficiency

Eco-efficiency relates to the most efficient use of resources with the least possible damage to the environment, e.g. by recycling materials in products, the use of raw materials and of energy to convert the raw materials are limited.

Environmental reporting percentage

The environmental reporting percentage (ERP) is the measure calculated (based on the level of environmental reporting in annual financial statements) to indicate the level of environmental responsibility of a company.

Financial performance

For the purposes of this study financial performance of a company relates more to the profitability of that company than to the possible wider interpretation of financial performance.

Green

“Green” refers to matters relating to environmental responsibility, e.g. a green customer is a customer who wishes to support products that have been manufactured without damage to the environment.

1.4 PROBLEM STATEMENT

The problem under investigation 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 main problem, the following sub-problems need to be investigated as well:

Environmental responsibility

How should environmental responsibility of companies be determined and measured?

Financial performance

What measures of financial performance should be used?

Research methodology

How should the relationship between environmental responsibility and financial performance of South African companies be determined?

1.5 HYPOTHESES

For purposes of this study the following hypotheses are stated:

Primary hypothesis

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.

Secondary hypotheses

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 higher the environmental reporting percentage of a company is, the higher is the economic value added (EVA) of that company.

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.

1.6 LIMITATIONS

The following limitations are applicable:

Only publicly listed companies on the Johannesburg Stock Exchange are included.

A few companies' annual financial statements are not included, e.g. due to a change in year-end or a very late publication.

The use of an environmental reporting percentage based on the level of reporting in annual financial statements of companies may not be an actual reflection of the environmental responsibility of a company. It is possible that certain companies may act in a responsible manner as far as the environment is concerned, without reporting on it in their annual financial statements. Certain companies may report on action taken to benefit the environment, but their daily operations may cause considerable damage to the environment.

1.7 ORGANISATION OF THE STUDY

A review of the related literature will be provided in chapter 2. The theoretical foundation of environmental reporting will be investigated. This investigation will be based on fundamental accounting principles. The stakeholders interested in

environmental reporting will be identified. The influence of these stakeholders on the environmental information presented in annual financial statements will be examined. The costs or disadvantages versus the benefits or advantages of environmental responsibility will be explored. The findings of previous studies that examined the relationship between environmental performance and financial performance will be investigated.

"Environmental responsibility" will be examined in chapter 3. Environmental responsibility will be defined, taking previous researchers' definitions into consideration. The elements of environmental responsibility will be discussed, concentrating on the pressures towards environmental responsibility that companies experience and the progress made by companies. Previous studies will be used to identify the most appropriate measures to use when measuring environmental responsibility.

"Financial performance" will be examined in chapter 4. Profitability will be defined, as it is a key component of financial performance. Elements of financial performance will be discussed under the profit zone and causal factors. The measures most often used to measure financial performance will be identified from relevant literature.

The research design and methodology will be presented in chapter 5. The period investigated, as well as the criteria for the selection of companies will be stated. Based on previous research, measures of environmental responsibility will be selected. Data available to measure environmental responsibility (using the selected measures) will be identified. Financial performance measures will be selected based on the financial performance measures to be identified in chapter 4, as well as the financial performance measures used in previous research. The methodology based on previous research relating to correlation analyses will be presented, as well as the methodology for the sector trend analyses.

The results of the study will be analysed and discussed in chapter 6. The analyses and discussion will focus first on the correlation analyses and then on the sector trend analysis.

The conclusion of the study, together with possible suggestions will be presented in chapter 7.

CHAPTER 2

REVIEW OF THE RELATED LITERATURE

2.1 INTRODUCTION

In this chapter literature related to the theoretical foundation of environmental reporting, the stakeholders interested in environmental reporting, and costs and benefits of environmental responsibility is reviewed. Findings of studies examining the relationship between environmental performance and financial performance are discussed.

2.2 THEORETICAL FOUNDATION OF ENVIRONMENTAL REPORTING

The following definition is presented in *The basic postulates of accounting*, *Accounting research study no 1 (1961)* (Zeff 1982: 23):

"The function of accounting is:

- to measure the resources held by specific entities;
- to reflect the claims against and the interests in those entities;
- to measure the changes in those resources, claims and interests;
- to assign the changes to specifiable periods of time; and
- to express the foregoing in terms of money as a common denominator."

The above definition is compatible with the following definition provided by the committee on terminology of the American Institute of Certified Public Accountants in 1953 (Belkaoui & Jones 1996: 29):

> "Accounting is the art of recording, classifying, and summarizing, in a significant manner and in terms of money, transactions and events which

> are, in part at least, of a financial character, and interpreting the results thereof."

Financial statements are the product of accounting. The objective of financial statements is to provide information about the financial position, performance and changes in financial position of an enterprise that is useful to a wide range of users in making economic decisions (SAICA 1990: par. 12).

Financial statements also show the results of the stewardship of management, or the accountability of management for the resources entrusted to it. Those users who wish to assess the stewardship or accountability of management do so in order that they may make economic decisions; these decisions may include, for example, whether to hold or sell their investment in the enterprise or whether to reappoint or replace the management. (SAICA 1990: par 14.)

Rubenstein (1992: 33) states that companies routinely account for complex estimates of pension liabilities, oil reserves and actuarial valuations, therefore he maintains that basic accounting concepts can be modified to reflect the unique interests of environmental stakeholders. He believes accounting should be redefined as follows:

> "Accounting measures the resources consumed producing goods and services for trade and for promoting public welfare, as well as the resources preserved, and wealth created for future use, in accordance with conventions mutually agreed upon by both the stewards of these resources and the stakeholders to whom they are accountable."

According to Buhr (1994: 37) the boundaries of accounting are being pushed and challenged. The role of accounting is seen to be more than financial disclosure limited to dollar values presented in the financial statements. How much more has not yet been well defined. There is also a clear need articulated for accounting to adapt to meet society's changing needs. Because accounting serves society, it must change as society changes.

Society is beginning to demand and expect financial information on a corporation's environmental performance just as society has demanded and come to expect cash flow information, future oriented financial information and (in its day) current value information (Buhr 1994: 30).

Financial performance and environmental performance are not two separate phenomena. Rather, they are inextricably linked. Expenditure on pollution prevention or clean-up impacts on financial performance. Process improvements instituted to improve environmental performance can also affect financial performance. Better waste management affects financial performance. Failure to comply with legislation can affect financial performance. Therefore, aside from any socially desirable reasons for being seen to be environmentally responsible, there is a need for the corporation to disclose information on environmental performance, at least as to how it affects financial performance. (Buhr 1994: 31.)

Gray (1993: 305) agrees with the 1992 EC plan, *Towards sustainability*, that it will be necessary to redefine "accounting concepts, rules, conventions and methodology" in order to permit accounting "to internalize all external environmental costs". However, genuinely environmentally sensitive business and environmentally sensitive accounting will require far more fundamental changes. The very framework of conventional accounting will have to be rebuilt from scratch. He hopes to see three phases of development in accounting thought and accounting practice:

- Development which clearly falls within conventional accounting;
- following from the above, the evolutionary process – within which accounting begins to recognize environmental considerations – that will produce changes in the accounting itself; and
- new developments because conventional accounting cannot really be fully responsive to the change in culture that comes with greater environmental sensitivity.

The concept of environmental accounting with its numerous complexities is leading to a revolution in the accounting field. It has resulted in close scrutiny of

the precision with which assets and liabilities are defined, generated questions as to for whom financial statements are produced and is leading to an expansion of the accounting profession's traditional duties. (Allen 1994: 53.)

The annual report has traditionally been the means to satisfy accountability relationships with investors and creditors. It is also the key document used to satisfy a broad range of stakeholders. However, there are other communication vehicles which the corporation uses to convey messages to its stakeholders. Most notably is the recent use of an "environmental report". (Buhr 1994: 23.)

According to the US Census Bureau US manufacturers spend as much as 0.9 percent of sales on pollution abatement and control, with that figure rising steadily. The size and upward trend in environmental costs has led to a push for better environmental accounting. Environmental accounting refers to a set of practices within firms that leads to a better understanding and management of environmental issues and their associated costs. According to the World Resources Institute's 1995 report, Green Ledgers, which examined several case studies in the chemical and other related industries, firms can learn more about their own costs and identify opportunities to improve environmental and economic performance by implementing these practices. (Quellette 1996: SR 16)

Ranganathan and Ditz (1996: 39) of the World Resources Institute stress that environmental accounting need not require a major overhaul of existing accounting and information systems. Conducting a pilot project is often a good way to begin. To be successful, a pilot project needs the support of people across the organization, with accountants being instrumental. As environmental costs are pooled in overheads and later allocated, crucial links are lost between environmental costs and the responsible products, processes and underlying activities (Ranganathan & Ditz 1996: 38).

2.3 STAKEHOLDERS INTERESTED IN ENVIRONMENTAL REPORTING

Stakeholders are defined as any entity, group or individual that has the power to impact the corporation. Some examples of stakeholders include employees, suppliers, customers, stockholders, bondholders and other lenders, the public and the global community. (Allen 1994: 124.)

Van Niekerk (1998: 24 – 25) identified investors and stock exchanges; lenders, suppliers, trade creditors and credit bureaus; governments and their agencies; the public; customers and trade associations; as well as employees and their representatives as stakeholders. She identified these stakeholders by using the categories identified by AC 000, *Framework for the preparation and presentation of financial statements*, and those identified by the American Accounting Association (1973). The categories identified by the American Accounting Association correspond to those identified by AC 000, except for stock exchanges and representatives of stakeholders (Van Niekerk 1998: 20).

According to Aspinwall & Company with the assistance of the Association of Chartered Certified Accountants (1997: 5 – 6) an individual company may be able to define several stakeholder groups with an interest in its environmental performance e.g.:

- Employees
- Regulators and policy-makers
- Opinion-formers, including journalists, academics and environmental pressure groups
- Local communities
- Customers
- Suppliers and other business partners
- Shareholders, investors and insurers.

AC 000 identifies the following users of financial statements:

- Investors
- Employees
- Lenders
- Suppliers and other trade creditors
- Customers
- Governments and their agencies
- Public

(SAICA 1990: par. 9).

When comparing the stakeholders listed by Allen, Aspinwall & Company and AC 000 above employees, suppliers and customers are identified directly by all of them. (Van Niekerk used AC 000 to identify stakeholders; therefore no reference is made here to the stakeholders she identified.) AC 000 identifies the public as another stakeholder, while Allen refers to the public and the global community. Aspinwall & Company specifically identifies stakeholders with an interest in environmental performance and breaks the broad term of public or society down into opinion-formers, including journalists, academics and environmental pressure groups, while referring to local communities separately. AC 000 identifies governments and their agencies, while Aspinwall and Company identifies regulators and policy-makers which correspond to governments and their agencies. AC 000 identifies investors and lenders as separate stakeholders. Allen combines stockholders, bondholders, and other lenders as one group, while Aspinwall & Company combines shareholders, investors and insurers as one group.

The above-mentioned comparison of stakeholders can be illustrated as follows:

Stakeholder	*AC 000*	*Aspinwall & Co*	*Allen*
Investors	√	√	√
Employees	√	√	√
Lenders	√		√
Suppliers/trade creditors	√	√	√
Customers	√	√	√
Governments	√	√	
Public/society	√	√	√
Insurers		√	
Local communities		√	

AC 000 is based on the international framework of which the main purpose is to assist with the development of future international accounting standards and the review of existing international accounting standards (SAICA 1990: par. 1). This international framework is widely accepted by accounting organizations. Although Van Niekerk (1998: 21 – 24) used the stakeholders identified by AC 000 she also referred to studies relating to users of social information in company financial statements. She did not adapt the stakeholders identified by AC 000 with the stakeholders identified by these studies. However, it should be noted that these studies mainly divided “public” into various groups. The stakeholders identified by AC 000 are therefore included as stakeholders for the purposes of this study.

However, to facilitate a meaningful discussion of stakeholders interested in environmental reporting, the stakeholders identified by AC 000 are not presented in the same order as in AC 000 while local communities, insurers, as well as accountants and auditors are added as stakeholders. Van Niekerk (1998: 23) specifically noted the importance researchers assigned to community stakeholder groups — several of them emphasized local communities from an environmental

point of view. Aspinwall & Company (1997: 5 – 6) identified local communities and insurers as stakeholders with an interest in a company's environmental performance in their recent Guide to Environment and Energy Reporting and Accounting. Environmental claims relating to pollution clean-up and asbestos hit the global insurance industry hard, and climate change represents the next threat (refer to section 2.3.7). Insurers are therefore definitely interested in their clients' environmental performance and are identified as stakeholders. Accountants and auditors are identified as a separate stakeholder group due to the "demand from all players in financial markets to put a price on the environmental risks faced by companies" (Schmidheiny & Zorraquin 1996: 131). The accounting profession is reacting to this demand (refer to section 2.3.8).

De Villiers (1998: 163) found that users of financial statements are in many cases more positive about more comprehensive environmental corporate reporting than the preparers and the auditors of these statements. He identified chartered accountants, stockbrokers, banks and assurance companies as users (according to accountability theory) for the purposes of his study. His choice of these stakeholders lends support to the inclusion of insurers as well as accountants and auditors as stakeholders.

Considering the above-mentioned the following stakeholders were identified as 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.

2.3.1 Society

Over time, activities that are merely socially desired become required as social expectations are entrenched in law, government regulations and cultural norms. New social expectations arise and new activities are seen as being socially desirable. Because of the existence of the implicit social contract, the corporation becomes accountable to one degree or another, to society. (Buhr 1994: 21 – 22.)

Society is placing increasing emphasis on the importance of the environment and managing the environment in a more responsible manner (Dunlap & Scarce 1991). The United Nations held a conference on environment and development during 1992 where the Business Council for Sustainable Development (BCSD) presented a global business perspective on sustainable development. The title of their report *Changing course* was chosen with some care. "While the basic goal of business must remain economic growth, as long as world population continues to grow rapidly and mass poverty remains widespread, we are recommending a different course toward that goal. There will be changes in direction and changes in the measurements of progress to include indicators of quality as well as quantity. Business is a large vessel; it will require great common effort and planning to overcome the inertia of the present destructive course, and to create a new momentum toward sustainable development." (Schmidheiny 1992: xxii.)

In a personal note to the preface of *Changing course* the chairman of the BCSD, Stephan Schmidheiny (1992: xxiii) says that he founds the combination of business and environment concerns appropriate. Conservation of the environment and successful business development should be opposite sides of the same coin – the coin being the measure of the progress of human civilization. The degree to which these two halves can be joined in the world of human activity, and the speed of this process, will determine the rate at which sustainable development will turn from a vision into reality.

Sustainable development refers to one generation enabling the next generation to be as potentially well-off from both a natural resource and economic perspective.

The new social contract between business and society reflects the idea that business, whose existence is the result of society's consent, owes something more to society than pure economic development. Both of these still-evolving concepts result from years of legislation, regulation, judicial interpretation, ethical considerations, and international scrutiny that attempt to bridge the generations and the nations of the world. (Allen 1994: 6 – 7.)

The World Business Council for Sustainable Development (WBCSD) was formed in January 1995 through a merger between the BCSD in Geneva and the World Industry Council for the Environment in Paris – the two organizations that led the business response to the challenges arising from the UN conference on environment and development in Rio in 1992. The WBCSD plays an important role in developing closer cooperation between business, government, and others, and in encouraging high standards of environmental and resource management in business itself. Its mission is to provide business leadership as a catalyst for change toward sustainable development, and to promote eco-efficiency in business. (Schmidheiny & Zorraquin 1996: xv.) ESKOM is the only South African company that is a member of the WBCSD.

Internalizing environmental costs, greater use of economic instruments, new national accounts, new bases of taxation, new attention to financial markets by "the greens" are clearly the direction society is moving in . The more forward-looking firms are investing in eco-efficiency, and then joining groups calling for more economic instruments and the internalizing of environmental costs so that their investments will pay off sooner in financial terms. Change will, as always in major societal shifts, accelerate and decelerate and will occur faster in some places and some business sectors than in others. But businesses that do not keep up with such changes will suffer. (Schmidheiny & Zorraquin 1996: 27 – 28.)

A combination of increased public awareness of environmental issues and freedom of access to information on the environmental performance of companies will serve to magnify media and pressure group interest in the environmental performance of industry. In order to manage media and pressure group attention,

companies must be able to state that they have made efforts to reduce their environmental impact. Claims which cannot be substantiated are likely to be seized upon and will be very detrimental to a company's public image. Companies which seek to communicate responsible environmental performance must base any claims that they make to this effect on hard facts which they are willing to communicate. (Welford & Gouldson 1993: 10.)

At one time, the mere fact that a company had a structured environmental management system that carried out the corporate environmental policy and provided information to top management was enough to satisfy outsiders of a company's environmental soundness. But now the public wants more. So environmental managers have been charged with two related communication activities: conforming to independent environmental standards and reporting publicly on environmental performance. (Schmidheiny & Zorraquin 1996: 149.)

Aspinwall & Company (1997: 6) provided the following generic expectations that opinion-formers, including journalists, academics and environmental pressure groups may have regarding environmental reporting. The report should:

- Provide objective disclosure without a public relations slant;
- show evidence of top level commitment;
- provide details of investment and expenditure on environmental improvement;
- provide inventories of discharges and emissions;
- demonstrate quantified targets; and
- show a commitment to sustainability.

2.3.2 Governments and their agencies

Even if a corporation does not embrace the concepts of sustainable development, it must as a minimum comply with environmental laws. Greening social conscience and changing social expectations have been translated into more stringent environmental laws. For example, current environmental legislation has provisions which include the imprisonment of executive officers for the violation of

environmental laws. By September 1992, there had been five jail terms imposed in Canada – the longest being eight months. (Buhr 1994: 27.)

The Resource Conservation and Recovery Act and The Comprehensive Environmental Response, Compensation and Liability Act (also known as Superfund) are United States acts that are often mentioned in the literature.

The Resource Conservation and Recovery Act of 1976, amended in 1986, authorized the Environmental Protection Agency (EPA) to define hazardous materials and to manage their manufacture, handling, transportation and disposal. The goal is to reduce or eliminate hazardous waste. Non-compliance can result in both civil and criminal penalties with the act imposing prison sentences of up to 15 years and fines up to $250 000. (Allen 1994: 9.)

The Comprehensive Environmental Response, Compensation and Liability Act (CERCLA or Superfund) of 1980 deals with the actual clean-up of already polluted sites. To fund the program, taxes were imposed upon those corporations importing or producing petrochemical or other toxic chemicals. Additionally, Congress authorized a $1,6 billion trust fund from whence the bill received its Superfund nickname. After clean-up, the EPA is authorized to charge any "potentially responsible parties" (PRP's) for the cost. PRP's include:

- Any polluting present or previous owner of a facility identified as a hazardous site;
- any non-polluting present or previous owner of a facility identified as a hazardous site;
- any generator or transporter of hazardous waste.

(Allen 1994: 9 – 10.)

The position regarding environmental legislation in South Africa was summarized by Masson (1993: 15), environmental affairs manager of Consol Ltd, as follows:

"Those of you who are active in the pollution control field will appreciate how many acts there are which have a bearing on pollution control. Needless to say there are several departments involved, some of which promulgate legislation but don't enforce it (Environment Affairs); sections of some acts (Water Act 54 of 1956) are enforced by one department's sub-directorate and other sections by other sub-directorates. Most acts make provision for the delegation of powers to local authorities (Health Act 63 of 1977), some of which have exercised this provision and others which have not (Environment Conservation Act 73 of 1989). The Water Act 54 of 1956 has been amended many times and the Hazardous Substances Act 15 of 1973 lists hazardous substances intended to be relevant to pesticides but which many other industries also use. Tracing legislation and promulgated regulations related to the acts is an ordeal in itself."

In the White Paper on the Conservation and Sustainable Use of South Africa's Biological Diversity (RSA 1997: 93) the government recognizes the following limitations of existing legislation:

Fragmentation

There is an extremely high degree of fragmentation, with legislation being spread across many different departments, at both national and provincial levels. Exacerbating the problem is the lack of national norms and standards from which legislation can be harmonized.

Conflict of interest

Legislation is often conflicting, a problem heightened by the fact that a number of the government departments responsible for enforcing compliance with environmental regulations are also charged with promoting the activities that they are supposed to regulate.

Ineffective enforcement

Although a substantial amount of environmental legislation is in place in South Africa, poor enforcement renders much of it ineffectual. Compounding the problem are the often inappropriate penalties imposed for infringing legislation, and the lack of capacity within government agencies to monitor infringements.

According to the above-mentioned White Paper (RSA 1997: 95), the government will undertake the following actions:

- As part of the legislative and institutional audit that will be undertaken to implement the general national environmental policy, an investigation will also be performed of the efficacy of existing and proposed biodiversity-related legislation. Such an investigation will lead either to the development of new legislation or the amendment of existing legislation, and will indicate institutional changes required.
- Following this audit, framework biodiversity legislation will be developed and implemented. It is envisaged that such legislation will rationalize and harmonize existing legislation, will articulate national norms and standards, and will embrace the holistic approach towards biodiversity that is currently absent in the law. The participation of both the national and provincial spheres of government will be ensured in this process so that the result is in keeping with the concurrent responsibilities held by these levels of government. This will further lead to the development or amendment of provincial legislation as appropriate. The purpose of the framework legislation described would largely be to give effect to the goals concerning the conservation and sustainable use of biodiversity.

The National Water Act 36 of 1998 has repealed and replaced a multitude of water laws. Existing laws dealing with water allocation and control were outdated and the development of our society demanded that management of our natural resources be re-examined taking cognisance of social, economic and environmental factors. The purpose of the National Water Act includes promoting

efficient and sustainable use of water in the public interest as well as facilitating social and economic development. (Stein 1998.)

The National Water Act (RSA 1998) deals with the prevention of pollution of water resources due to activities on land, in part 4 (section 19) of the Act. The person who owns, controls, occupies or uses the land in question is responsible for taking steps to prevent pollution of water resources. If these steps are not taken, the relevant catchment-area management agency may take steps to prevent pollution or to remedy the results thereof, and to recover all reasonable expenditure from the persons responsible for the pollution. In part 5 (section 20) of the Act pollution of water resources as a result of an emergency, for example an accident causing the spill of a dangerous substance, is dealt with. The responsibility for the remedy of the situation is on the person responsible for the incident or on the person responsible for the relevant substance. If the responsible persons fail to act the relevant catchment-area management agency may take the necessary steps to recover the expenditure from each responsible person.

Sections 19 and 20 is a clear application of the polluter pays principle as discussed above under the Superfund Act of the United States. Section 151 of the Act (RSA 1998) includes not complying with sections 19 or 20 as a criminal offence. The first conviction is punishable with a fine and/or imprisonment of a period not exceeding five years, and the second or further convictions with a fine and/or imprisonment of a period not exceeding ten years.

With regard to environmental problems South Africa previously relied on systems based on the command-and-control approach. This approach has seldom provided cost effective and efficient solutions. There is now a need for a system which relies more on economic incentives than regulatory supervision and which is self-funding. South Africa's legal and policy framework is now suitable for the introduction of polluter-pays-principle systems. Pollution or emission charges have been widely used internationally and have proven to be successful. The South African water management sector refers to waste water charges. (Clement, Forster, Taviv & Herold 1998: 2; 21.)

Historically the position of the mining sector has been a favoured one according to Dixon (1998: 2). The government was supportive of mining as it contributed so enormously to the gross domestic product. To entrench the position, safeguards were built into the prevailing legislation to ensure that mining would not be restricted by conflicting interests. Land required for prospecting and mining was specifically excluded from the ambit of the Physical Planning Act of 1967. Under the Environment Conservation Act, regulations that identified waste excluded mining waste. The old Water Act of 1956 placed water required for mining purposes on proclaimed land in a superior position to other water uses on that land. The National Water Act 36 of 1998 makes it clear that water required for industrial purposes will only be available if the demands of the ecological reserve and basic human needs have been met. 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. This has led to a levelling of the playing field. (Dixon 1998: 2 – 3.)

The 1993 Constitution of the Republic of South Africa Act (RSA 1993: s.29) provides that "every person shall have the right to an environment which is not detrimental to his or her health or well-being". The 1996 Constitution of the Republic of South Africa Act (RSA 1996: s.24) improved as follows on the 1993 section:

"Everyone has the right to an environment that is not harmful to their health or well-being; and to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that –

- prevent pollution and ecological degradation;
- promote conservation; and
- secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development."

The Environment Conservation Act (RSA 1989) authorizes the responsible Minister to determine policy for environmental conservation and makes it incumbent upon all officials to apply the policy. A General Environmental Policy

(RSA 1994) was determined in accordance with the provisions of the Environment Conservation Act. It contains several general guidelines of which the following are important to business:

Trusteeship

Every generation has an obligation to act as a trustee of its natural environment and cultural heritage in the interest of succeeding generations.

Responsibility

The state, every person and every legal entity has a responsibility to consider all activities that may have an influence on the environment duly and to take all reasonable steps to promote the protection, maintenance and improvement of both the natural environment and the human living environment.

Sustainable development

Sustainable development is accepted as the guiding principle for environmental management. Sustainable development is only possible if natural resources are treated in a manner which would be expected from a trustee of those resources.

Land use

A planned analysis for large scale or high impact development projects is required. Such an analysis should lead to an environmental impact assessment, integrated environmental management and involve all interested and affected parties in decision making.

Internalization of externalities

Where appropriate, environmental resource economics should be used to apply measures that will internalize external environmental costs, such that they are incorporated into exploitation and production costs.

(RSA 1994: 36 – 39; Huckle 1995: 26 – 27.)

A new environmental policy was developed which was published during May 1998 in the White Paper on an Environmental Management Policy for South Africa. According to Dixon (1998: 14) the principles identified in the document are commendable and were a result of an extensive consultative process; however, the draft legislation which flowed from the White Paper is not as commendable.

The National Environmental Management Bill is intended to give effect to the White Paper on an Environmental Management Policy for South Africa. In some cases the Bill ignores processes already underway which impact on the environment, e.g. the Integrated Pollution and Waste Management Policy and the Integrated Environmental Management Process and in others does not recognize or integrate with existing legislative provisions e.g. as regards the Environment Conservation Act. It also does not reflect in some instances the provisions of the White Paper. (Dixon 1998: 15.)

The above-mentioned Bill is intended to provide a framework for integrating good environmental management into all development activities and promote certainty with regard to decision-making by state organs on matters affecting the environment. It establishes a lead co-ordinating role for the Department of Environmental Affairs and Tourism. The Bill provides for the *"best practicable environmental option" – the option that provides for the most benefit and causes the least damage to the environment as a whole* – as the test for integrated environmental management. (Dixon 1998: 15.)

Aspinwall & Company (1997: 6) provided the following generic expectations that regulators and policy-makers may have regarding environmental reporting. The report should:

- Demonstrate commitment to full compliance;
- acknowledge any past failure to comply and describe remedial action plans;
- provide reassurance about systems in place to avoid future failures; and
- show leadership in relation to proposed legislative or policy changes.

2.3.3 Local communities

Industry shares its surrounding environment with the local population. Increasingly this population is demanding a high level of environmental performance from its industrial neighbours, and seeks some degree of reassurance that they are not exposed to significant environmental risk due to a company's operations. Trends toward freedom of access to environmental information will give greater power to local communities when they question the activities of local industrial co-habitants. In order to foster a positive working relationship, companies must improve their environmental performance and communicate their efforts to the surrounding communities. (Welford & Gouldson 1993: 9.)

In a corporate governance guide SAICA (1997: 12) states that the enterprise should see itself as a resident in the broad community, and should act in a spirit of social consciousness and awareness. It should be sensitive to the needs of the local communities. Reporting environmental performance goes a long way toward building credibility in the community where a company operates (Sandborg 1993: 59).

Aspinwall & Company (1997: 6) provided the following generic expectations that local communities may have regarding environmental reporting. The report should:

- Provide information about activities at the site;
- detail who to contact for further information; and
- provide evidence of a good safety and environmental record.

2.3.4 Customers

The "green consumer" has probably been a major force on the process of organizational environmental sensitivity. Consumer boycotts and related activism have a long (and, at times, successful) history. The late 1980's in the UK saw the arrival of this new breed of consumer. The movement has certainly raised awareness, brought new products to the market and set in train effects of a far

wider influence than the recycling of toilet rolls and the phosphate-freeness of washing powders. (Gray 1993: 269.)

According to Welford & Gouldson (1993: 8) it is certain that credible claims relating to environmental performance constitute one positive element among the many characteristics upon which consumers base their purchasing decision. Companies which can validate and communicate the environmental performance of their products will enhance their competitive position. Sound environmental accountability gives a company integrity in the eyes of its consumer (Sandborg 1993: 59).

Short-term customers are the ones who buy products and services. Long-term customers are an often overlooked resource, comprised of the community at large. Companies like Monsanto are redefining their understanding of who their customer is and using this knowledge to a competitive advantage. (Denton 1994: 4 – 5.)

According to Schmidheiny & Zorraquin (1996: 62) "green consumerism" is maturing and switching from brand loyalty to company loyalty, with the general public believing it has a growing right to have a say in what companies do.

Aspinwall & Company (1997: 6 – 7) provided the following generic expectations that customers may have regarding environmental reporting. The report should:

- Demonstrate both commitment and competence;
- show that company policies aim to achieve the same high standards as those of its customer(s);
- demonstrate that future environmental requirements can be met; and
- show that the customers' business partners have a good reputation.

2.3.5 Suppliers and other trading partners

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 (Welford & Gouldson 1993: 8).

According to Huckle (1995: 32) South Africa's current and potential foreign trade partners are using environmental standards to generate trade barriers. For South African exporters this means that, in addition to normal import standards, specific environmental product restrictions or generic controls are applied. The generic controls may relate to recyclability or energy efficiency for example. Another generic control is the use of eco-labelling (labels which inform consumers that a product is environmentally more friendly relative to other products in the same category) which is becoming increasingly common in the EC countries. Packaging standards which regulate the volume, type and recyclability of packaging materials are particularly affecting products packaged in glass, aluminium or cellulose.

Aspinwall & Company (1997: 7) provided the following generic expectations that suppliers and other business partners may have regarding environmental reporting. The report should:

- Explain the company's environmental policy;
- indicate priority issues and goals; and
- provide clarity about the process for managing issues with suppliers.

2.3.6 Employees

Employees' concerns relating to the environmental performance of their employers goes beyond the impact of operations on the working and living environment. Increasingly people wish to work for ethical and responsible companies. Companies that reflect the environmental concerns of the public will find it easier to attract, retain and motivate a quality workforce. (Welford & Gouldson 1993: 9.)

There are two United States federal laws that require environmental risk reporting to employees. The Occupational Safety and Health Administration has developed a hazard communication standard to protect workers handling chemicals. It requires companies to have an active program to inform workers about hazardous

chemicals in the workplace and how to deal with them. The Superfund Amendments and Reauthorization Act and the Pollution Prevention Act require companies to gather a lot of information on hazardous chemicals. This is reported to the federal government and then incorporated into a national computerized data base. Workers and the general public have ready access to this information. (Harrison 1993: 51.)

According to Harrison (1993: 54) successfully handling the demands of the worker right-to-know and emergency planning regulations means going beyond the bare bones of the regulatory requirements to communicate with employees. It means developing training, orientation, and ongoing information programs that are accessible, readily understood, up-to-date, and interactive – responsive to changing worker needs and flexible enough to allow input from them.

Aspinwall & Company (1997: 6) provided the following generic expectations that employees may have regarding environmental reporting. The report should:

- Link performance to corporate success and job security;
- demonstrate compliance with legislation;
- demonstrate favourable performance compared with that of competitors; and
- show the role of employees in achieving targets.

2.3.7 Investors, lenders and insurers

The rapid growth of ethical investment schemes in recent years reflects the desire of many investors only to lend their financial support to companies which behave in a responsible manner. There are also a number of very good business reasons why investors prefer to work with companies that have a proven track record of environmental integrity. The structure of legal liability for environmental damage dictates that any party that causes environmental damage may be fined and required to bear the costs of remediating that damage and to compensate the affected parties for any associated losses. It is increasingly difficult and expensive to obtain insurance to cover such issues. Consequently, companies associated

with a significant environmental incident may suffer significant financial losses. These losses are then translated into reductions in the share price and the associated dividends. (Welford & Gouldson 1993: 10.)

Environmental claims have been called the insurance industry's black hole, with US insurers facing an estimated $2 trillion in pollution clean-up and asbestos-related claims. These figures do not include the additional billions that have either been paid or are reserved in the European insurance markets. The problem is so immense that the solvency of this global industry is under threat. (Schmidheiny & Zorraquin 1996: 118.)

Some lawyers specialize in digging out old policies that were written without a time limit for the notification of the claims, known in industrial liability insurance circles as "long-tail", and taking the insurers to court. The industry no longer writes long-tail policies and it excludes gradual pollution from environmental impairment cover, which is both costly and difficult to get. (Schmidheiny & Zorraquin 1996: 121.)

Even as the industry's solvency is under threat from past environmental liability, another potential danger has emerged: climate change – the theory that human activities are producing a less predictable, more destructive climate. Recent apparent instability in the weather and a succession of natural catastrophes have made it more difficult for insurers to calculate risks. (Schmidheiny & Zorraquin 1996: 118.)

Superfund (refer to section 2.3.2) affected both insurers and bankers. The insurance industry's Superfund nightmare began in 1985 when a lawyer maintained that his client's General Coverage Liability policy was in effect at the time waste was dumped and required the insurers to pay his clean-up costs (Schmidheiny & Zorraquin 1996: 120). Superfund specifically exempts lenders from being classed as "owners"; but there are excepting circumstances, and several US court cases have eroded this protection. Banks' potential liabilities are caused by their either operating, owning, or participating in the management of a

contaminating business, or aiding and abetting in environmental violations. (Schmidheiny & Zorraquin 1996: 102.)

In 1992, about 30 leading banks signed a "Statement by Banks on the Environment and Sustainable Development". This said they "regard sustainable development as a fundamental aspect of sound business management" and noted that "environmental risks should be part of the normal checklist of risk assessment and management.'" Since then, the number of the signatories has more than doubled and continues to grow. (Schmidheiny & Zorraquin 1996: 100.)

Banks increasingly require of companies to provide environmental assessments, including an evaluation of the company's compliance with existing laws and regulations and a technical analysis of critical sites, before they will grant a loan (Cormier, Magnan & Morard 1995: 46).

Cormier *et al* (1995: 46) states that investors should be provided with information to enable them to assess the quality of a company's environmental management, since this directly affects the company's profits and cash flows. Mullin & Sissell (1996: 52) quote Stevens, manager/corporate issues at DuPont, saying that analysts are not as interested in pollution prevention and waste reduction as they are in yield improvement, sales growth, cost management, and cash and earnings generation as a result of improved environmental management strategies.

Shareholders are pressuring companies for information on their environmental performance as they recognize that environmental performance is a key indicator of overall performance and ethical behaviour. The February 1993 issue of *IRRC News for Investors*, published by the Investor Responsibility Research Center, notes fifty-seven investor initiatives to place an environmental resolution on the agenda of company annual meetings. Many of these resolutions call for disclosure of environmental information to shareholders and the public. (Sandborg 1993: 58.)

Aspinwall & Company (1997: 6) provided the following generic expectations that shareholders, investors and insurers may have regarding environmental reporting. The report should:

- Inspire confidence that they are investing in a responsible forward thinking company;
- provide an assessment of environmental liabilities and risks;
- detail information on environmental investment and costs; and
- demonstrate that the organization's pro-active approach brings benefit from environmental opportunities.

2.3.8 Accountants and auditors

Accountants and auditors are coming under increasing pressure to include environmental information in the accounts of both companies and countries. The feeling among some, both within and outside the profession, is that the social costs of trade and industry should somehow be reflected in the accounts. Externalities, such as pollution, should be internalized so that the price of a shirt, a cake, or a car reflects its impact on the environment. The pressures stem from the supposition that accountancy should put a financial value on what society treasures. (Schmidheiny & Zorraquin 1996: 132.)

Accountants rarely think of themselves as the frontline of environmental management. However, their understanding of cost accounting systems, combined with their access to managers from all parts of the business, uniquely equip them to advance the understanding of environmental costs. (Ranganathan & Ditz 1996: 38.)

Although many accountants argue that it is not their job to adequately convey environmental risks and opportunities through accounting and reporting systems, 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. (Schmidheiny & Zorraquin 1996: 173.)

ED 113, *The consideration of environmental matters in the audit of financial statements,* issued August 1997, was approved for circulation by the Auditing Standards Committee of the South African Institute of Chartered Accountants (SAICA). It is intended to be a supplement to the statement of SAAS 250, *Consideration of laws and regulations in an audit of financial statements.* This exposure draft was prepared by the International Auditing Practices Committee and approved by the Council of International Federation of Accountants of which SAICA is a member.

The role of the accounting profession in interpreting market demands and supplying information wanted by markets is growing. This is especially obvious in mergers and acquisitions, where accountants – as financial advisers – are called on to verify valuations of land assets and capital equipment (which might become obsolete faster than expected when environmental regulations or market demand change). Mergers and acquisitions work by accountants is also putting the spotlight on other environmental issues that might affect the future profitability, and indeed the viability, of businesses. Another business opportunity for auditors is to help produce or audit environmental performance reports. (Schmidheiny & Zorraquin 1996: 134; 150.)

The companies that now strive to improve their eco-efficiency – and therefore possess the necessary environmental information – can only hope that accountants will be better equipped to help them communicate their progress to the markets. There is a danger that leaders do not always win, for example, early adopters of new technologies and processes might lose because the markets could take much longer than expected to recognize the benefits. (Schmidheiny & Zorraquin 1996: 135; 152.)

The majority of companies do not collect the necessary environmental data to give accountants the information environmentalists think they need, nor is the information that is collected presented in a way that accountants can use. But when companies do improve performance in this sector, accountants will have to take notice and change some of the accounting rules, if only to avoid being sued

for negligence. (Schmidheiny & Zorraquin 1996: 152.) In future society could seek redress from auditors for any failure to offer the right signals now.

2.4 COSTS AND BENEFITS OF ENVIRONMENTAL RESPONSIBILITY

2.4.1 Costs/disadvantages of environmental responsibility

An environmentally responsible firm 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 firm 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. Those competitors that chose only to comply (or not to comply) are now producing a product that is cheaper to manufacture. (Allen 1994: 69.)

Schmidheiny & Zorraquin (1996: 136) give an example relating to the standards applied to landfill in the United Kingdom. The waste companies that applied the strictest standards to their landfill sites because they believed government promises of enforcement have discovered instead that they are being undercut by competitors working to much lower standards and exploiting government lethargy. The high-standard operators not only suffer the impact of lower revenues, they must also service the cost of borrowing to finance the higher capital expenditure needed to meet the better standards.

2.4.2 Benefits/advantages of environmental responsibility

Managing resources well can benefit the environment, the community and the corporation. Further, better management of corporate environmental performance can improve international competitiveness. But these benefits can be achieved only if environmentally related expenditures are seen properly as corporate strategic investments and if environmental responsibility and corporate environmental strategy are integrated into the corporate culture. (Epstein 1996b: xv.) Other benefits Epstein (1996c: 22) mention are improved production yields, improved product quality, reduced operating costs and improved profitability.

Marcus (1996: 16) identified the following environmental opportunities with potential for benefiting the overall financial performance of the corporation:

- Pollution prevention
- Resource conservation
- Reducing capital project and process changes mistakes
- Eliminating accidental releases
- Eliminating fines and penalties
- Reducing site remediation reserves
- Disposing of previously unsaleble properties.

Allen (1994: 70) categorized the benefits of environmental responsibility as:

- a decrease in cost of operations;
- enhanced revenues;
- decrease in cost of capital; and
- decrease in regulatory risks.

Decrease in cost of operations

A decrease in cost of operations can be the result of a number of factors. An environmentally responsible firm may be able to decrease costs associated with employees, for example, higher morale may result and translate into a willingness to trade-off lower wages or the ability of the firm to attract higher quality workers. There could be a lower turn-over and less recruiting and basic training expenses. There is less potential for litigation of the toxic tort kind brought by an employee or employee group that may result from environmental exposure or accident. The lower costs or increased productivity associated with upper management not needing to spend time on regulatory matters should not be overlooked. (Allen 1994:70 – 71.)

Environmental inefficiency waste resources and signals process and operations inefficiencies. An example is leaking underground storage tanks which cost money and can hold up property transfers, acquisitions and divestitures.

(Sandborg 1993: 58.) On the other hand eco-efficiency seeks to minimize cost generators – such as material and energy use and toxics disposal – while enhancing durability and service, which can make a company's products more competitive in the marketplace (Anonymous 1996: 5).

The environmentally responsible company can often save money by decreasing excess packaging and by using recycled items as inputs. A major cost faced by most manufacturers is waste disposal and especially hazardous waste disposal. An environmentally responsible firm may be able to reduce these costs along with the liability associated with them. (Allen 1994: 73 – 74.)

It would seem reasonable to believe that it would cost less to prevent pollution rather than clean up after it. As in other areas, prevention pays. One of the first companies to focus on prevention instead of control was 3M. They started the cutting edge 3P (Pollution Prevention Pays) in 1975. Voluntary waste reduction has saved the company an estimated one-half billion dollars. (Denton 1994: 13.)

One chemical company that has had tremendous success at seeing waste as a resource is DuPont. DuPont notes that, just as a weed can be described as a plant out of place, waste manufacturing may be a product looking for a market. The company's approach of converting "waste" into desirable consumer products has created a thriving enterprise. The company has developed many businesses from the "waste" or by-products of other manufacturing processes as well. DuPont notes that as of 1991, had it not pursued these businesses, disposal costs alone for what was once defined incorrectly as "waste" would have exceeded a projected $100 million each year by the turn of the century. (Denton 1994: 14 – 15.)

A total quality environmental management program can help organizations comply with increasingly stringent environmental regulations, reduce manufacturing costs by lowering the tangible cost of chemical disposal, waste treatment, and licensing and laboratory fees (Mannion 1996: 32).

Enhanced revenues

Enhanced revenues via environmental responsibility may be achieved in a number of ways. An environmentally responsible firm is able to market itself and its products to attract a growing segment of the world population which is demanding more environmentally friendly manufacturing, packaging and eventual recyclability of products. This marketing strategy can in the long-run increase volume while minimizing public relation and advertising costs. Distributors may require a risk premium for dealing with environmentally irresponsible firms as distributors may be indirectly tainted by association when negative publicity occurs to the supplying corporation. Similarly, firms supplying complementary products or services may choose to avoid taint and align themselves with environmentally responsible corporations. An environmentally responsible firm may have the ability to attract extremely competent and capable board members which conceivably could enhance the corporations image and profitability. (Allen 1994: 74 – 75..)

According to Klassen & McLaughlin (1996: 1201) manufacturers who demonstrate efforts to minimize the negative environmental impacts of their products and processes, recycle post-consumer waste, and establish environmental management systems are poised to expand their markets or displace competitors that fail to promote strong environmental performance.

Decrease in cost of capital

Another way that the environmentally responsible firm may prosper is through the reduction of its cost of capital while simultaneously increasing its accessibility to funds. Most lenders in any type of real estate transaction will perform environmental audits. An environmentally deficient firm, or a marginal firm in a high pollution industry facing new regulation, may face huge fines and/or need to make large expenditures to comply with regulation. These expenditures could eventually make the firm unprofitable or result in the firm's inability to make principal and interest payments. Thus, a more environmentally responsible firm will receive a higher credit rating. There are large institutional investors and

individuals who invest via mutual funds who prefer environmentally responsible firms. (Allen 1994: 75 – 76.)

Decrease in regulatory risks

The environmentally responsible firm is more adaptable when changes in law or enforcement takes place in the regulatory arena. New regulation will not hinder its operations, while its competitors have to bear the costs of additional regulation. This may force one or more of them out of business with the effect of increasing market share for the environmentally responsible firm while increasing cost of entry into the industry. The environmentally responsible firm need not be concerned about a finding of non-compliance resulting in fines, negative publicity, a subsequent costly public relations campaign and expensive litigation.(Allen 1994: 76 – 77.)

The potentially high cost of not complying with environmental legislation includes direct monetary losses due to fines and lost production as well as adverse market impact due to negative public perception. This high cost of non-compliance compels companies to actively cultivate a “green” image based on ecologically sound production practices. (Ranger 1993: 44.)

2.5 STUDIES EXAMINING THE RELATIONSHIP BETWEEN ENVIRONMENTAL PERFORMANCE AND FINANCIAL PERFORMANCE

Previous studies that examined the relationship between environmental performance and financial performance have inconsistent results. Bragdon & Marlin (1972: 17) found initial support for a positive correlation between better pollution control and higher firm profitability. Bowman & Haire (1975: 52 – 53) reexamined the same data, but partitioned firms into three levels of environmental performance. They found evidence for an inverted U-shaped curve. Firms with a median level environmental performance had a higher return on equity than either extreme. Firms with a low level environmental performance had a lower return on equity than those with a high level environmental performance.

Spicer (1978a: 109) found that better pollution control is associated with higher profitability and price/earnings ratios, lower risk and larger size. Chen & Metcalf (1980: 177) disputed the findings of Spicer and found that the moderate to strong associations between pollution control record and financial indicators are spurious due to at least one common background variable, namely size of operation.

The above studies used accounting numbers to measure the relationship between environmental performance and financial performance, while the following studies used stock market performance:

- Alexander & Buchholz (1978: 479) evaluated stock market performance over five years and adjusted performance for risk in an effort to eliminate the "empirical deficiencies" they had identified in two studies with contradictory findings by Moskowitz (1972) and Vance (1975) respectively. They found that the degree of social responsibility as measured by the rankings of businessmen and students bears no significant relationship to stock market performance. They suggested that the reason for this was that stock markets are efficient and therefore any positive or negative effects associated with the degree of social responsibility of a firm are reflected immediately in its stock price. (Alexander & Buchholz 1978: 485.)
- Spicer (1978b: 80) found that knowledge of companies' relative pollution control records does appear to have the potential to convey some relevant information to investors for judging the riskiness of the common stocks of companies in pollution-prone industries.
- Shane and Spicer (1983: 534 – 535) found some significant associations between security price movements and the release of externally produced social performance information, e.g. companies revealed to have low pollution-control performance rankings were found to have significantly more negative returns than companies with high rankings.
- Stevens (1984: 56) found that cumulative average returns for portfolios of firms with "high" estimated expenditures for pollution control are consistently below the returns for portfolios of firms with "low" estimated expenditures as well as being consistently below control portfolio returns.

- Mahapatra (1984: 37) came to the conclusion that investors view pollution control expenditures, legally or voluntary, as a drain on resources which could have been invested profitably, and do not “reward” the companies for socially responsible behaviour.

Arlow & Gannon (1982: 240) examined empirical research on corporate social responsiveness, including its relationship to economic performance. They found that the research studies do not provide strong support for a positive relationship between social responsiveness and economic performance, and concluded that economic performance is not directly linked, positively or negatively, to social responsiveness.

Cochran & Wood (1984: 54 – 55) found that *within industry groups* the financial variable most strongly correlated with corporate social responsibility (CSR) is asset age and that omission of this variable results in a spurious correlation of CSR and financial performance. Specifically, firms with older assets have lower CSR ratings. They also found that even after controlling for asset age, using a large sample, and industry-specific control groups, there still is weak support for a link between CSR and financial performance.

Ullmann (1985: 540) studied the inconsistent findings that had resulted from studies of the relationships among social disclosure, social performance, and economic performance of US corporations. He could not detect a clear tendency but identified a lack in theory, inappropriate definition of key terms, and deficiencies in the available empirical data bases as the main reasons for the inconsistencies.

Aupperle, Carroll & Hatfield (1985: 462) found no statistically significant relationships between social responsibility and profitability and concluded that there is insufficient evidence to support the claim that social responsible firms are more profitable than other firms.

Freedman and Jaggi (1988: 54) studied the association between the extent of pollution disclosures and economic performance of firms belonging to four highly polluting industries. The results for the total sample indicated that there is no association between the extensiveness of pollution disclosures and economic performance. However, a significant positive correlation was detected for the oil refining industry when the sample was segmented by industry group. They also found that large firms with poor economic performance are likely to provide detailed pollution disclosures.

McGuire, Sundgren & Schneeweis (1988: 869) found that prior financial performance is generally a better predictor of corporate social responsibility than subsequent performance. They argue that firms with high financial performance and low risk may be better able to afford to act in a socially responsible manner.

Belkaoui & Karpik (1989: 47) found that the larger the firm the more likely it is that managers authorize outlays for social performance that defer reported earnings from current to future periods. They attributed the insignificant and negative regression coefficient yet positive pairwise correlation association of economic performance with social disclosure to a multicollinearity problem encountered in the study and suggested that this multicollinearity effect may also explain the observance in other studies of either positive, negative or no correlation of profitability with social disclosure.

In a South African study Wilkinson (1989: ii) reached contradictory results: High profitability as measured in accounting terms does not correlate with a high corporate social responsibility rating. High profitability as measured in market terms does however correlate with a high responsibility rating.

Capon, Farley & Hoenig (1990: 1143; 1149) performed a meta-analysis of results from studies relating various factors to financial performance. They found a positive correlation between social responsibility and financial performance.

Patten (1991: 305) found that the results of regression analysis on the level of social disclosure indicate that both size and industry classification are significant explanatory variables. In contrast, the profitability variables included in the analysis were not significantly associated with the extent of social disclosure.

Hackston & Milne (1996: 101) reported results for New Zealand companies that show that both size and industry are significantly associated with amount of disclosure, while profitability is not.

According to Klassen (1995: 40) efforts to evaluate performance at firm level suffer from a limited view of both environmental performance and business performance. Klassen & McLaughlin (1996: 1212 – 1213) argue that, according to the efficient market theory, stock prices are proxies for financial performance, and thus to a large degree represent the actual financial benefits of environmental performance. Significant positive abnormal stock returns were documented following positive environmental events, highlighting the perceived value of strong environmental performance. Significant negative returns were documented for environmental crises, adding further empirical support for a causal link between environmental and perceived future financial performance.

Although environmental risks, opportunities, and liabilities have the capacity to profoundly affect the profitability and, indeed, the viability of the firm, empirical work in this area is meager. Results of previous research have been mixed due to short time intervals studied, lack of control variables and questionable or insufficient dependent variables. (Allen 1994: 125.)

Allen's study examined performance over the 1980 – 1989 time period for companies ranked by the Council on Economic Priorities (an independent, research-oriented, non-profit organization) and which have information available on the Compustat database. Findings of this study include the following:

- Corporate performance with regard to environmental responsibility is related to overall firm value as gauged by the measure excess value. Adopting an

environmentally responsible strategy appears to significantly enhance corporate financial performance for all firms except those serving industrial customers. Contrarily, those firms supplying industrial customers seem actually to be benefiting financially from a strategy of environmental indifference or irresponsibility.

- The enhanced financial performance of environmentally responsible firms (other than those that serve industrial customers) appears to be attributable to stakeholder-agency considerations. The significantly superior financial performance of environmentally responsible corporations in this category seem to be due to stakeholders rewarding and/or not penalizing firms which are environmentally responsible. That is, a strategy of environmental responsibility produces greater stakeholder cash flows and/or lower stakeholder-agency costs. This may occur, in whole or in part, from enhanced revenues, lower operating costs, a lower cost of capital and lower regulatory risk for environmentally responsible firms.
- The exception to the findings, firms who serve industrial customers, may also be stakeholder-agency related. Stakeholders' general awareness of a firms' predisposed strategy towards environmental responsibility and/or the ability of stakeholders to reward or penalize such behaviour may be less for industrial suppliers than it is for firms which make products for or provide services to the ultimate consumer.

Huckle (1995: 87) 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 the management of that company. Thus management should not assume that companies which are environmentally responsible are necessarily any more profitable or indeed, that companies which are not environmentally responsible are necessarily any less profitable. Similarly, the results of this research also suggest that the argument against being environmentally responsible, because it involves expenditure without adequate return, is unfounded. In general, those companies that demonstrate a high level of environmental responsibility can expect the same returns as those which demonstrate an inferior level of environmental responsibility.

In 1994, Hart and Ahuja of the University of Michigan examined 127 Standard & Poor's (S & P) 500 firms in manufacturing, mining, or some type of production. They produced a variable called "emissions reduction" based on the Investor Responsibility Research Center's (IRRC) 1993 Corporate Environment Profile. Then it was easy to seek correlation between decreases in emissions and an improved "bottom line". They found that return on sales and return on assets began to improve significantly the year after a major reduction in emissions. It took about two years for an effect to be seen on return of equity. The study also reached the not-unexpected conclusion that the biggest polluters enjoyed the greatest bottom-line benefits in cleaning up. Yet it suggests that even relatively clean companies can profit from the effort. (Schmidheiny & Zorraquin 1996: 65.)

A similar study in 1995 by the IRRC itself used U.S. government data to divide all S & P 500 firms into "high" and '"low" polluters – based on such variables as litigation, fines, toxic emissions, size of chemical spills, and so on – and then tracked the stock market results of these two "portfolios". The authors concluded that:

"Overall, the study found no penalty for investing in a "green" portfolio and, in many cases, low pollution portfolios achieved better returns than high pollution packages and the S & P 500 index. The study suggests that the increased attention being paid to environmental issues by both corporations and investors may well be warranted from the perspective of financial self-interest". (Schmidheiny & Zorraquin 1996: 66.)

In both of the studies mentioned above, the authors noted that although they had found a correlation between increased eco-efficiency and improved financial results, they had not proved cause-and-effect. Causality might run "backwards", in the sense that increasingly profitable firms might have more money to invest in eco-efficiency. However, according to Hart and Ahuja, "our hunch is that a 'virtuous circle' exists…That is, firms can realize cost savings and plow those savings back into further emission reduction projects for a number of years before

the investment/savings balance turns negative". (Schmidheiny & Zorraquin 1996: 66.)

If causality between environmental responsibility and financial performance can be proved, i.e. higher environmental responsibility causes higher profits, it could revolutionize management's attitude towards eco-efficiency. This study will investigate the possibility to use a causality test.

A summary of the findings of studies examining the relationship between environmental performance and financial performance is presented in tables 2-1 to 2-7. In these tables "positive" refers to a finding of a positive correlation between environmental performance and financial performance or another positive conclusion. "Negative" refers to a negative conclusion, e.g. that no relationship exists. "Neither" refers to a finding that is neither positive nor negative, e.g. the finding is inconclusive or contradictory.

Studies that used accounting numbers

Study	*Finding*	*Positive*	*Negative*	*Neither*
Bragdon & Marlin (1972)	Positive correlation between better pollution control and higher firm profitability	1		
Bowman & Haire (1972)	U-shaped correlation, with median level environmental performance showing best results			1
Spicer (1978a)	Positive correlation	1		
Chen & Metcalf (1980)	No correlation		1	
Cochran & Wood (1984)	Weak support for a link		1	
Aupperle, Carroll & Hatfield (1985)	No statistically significant relationships		1	
Allen (1994)	Positive correlation (except for those serving industrial customers)	1		
Hart & Ahuja (1994)	Positive correlation	1		
Huckle (1995) – S.A. study	No relationship (studied companies in industrial or mining sectors)		1	
		4	4	1

Table 2-1

Studies that used stock market measures

Study	*Finding*	*Positive*	*Negative*	*Neither*
Alexander & Buchholz (1978)	No relationship		1	
Spicer (1978b)	Relevant risk information conveyed to investors	1		
Shane & Spicer (1983)	Positive relationship	1		
Stevens (1984)	Positive relationship	1		
Mahapatra (1984)	Investors view pollution control expenditures as a drain on resources		1	
Klassen & McLaughlin (1995)	Significant positive abnormal returns for positive environmental events and vice versa	1		
IRRC (1995)	Positive correlation	1		
		5	2	–

Table 2-2

Studies that used accounting numbers and stock market measures

Study	*Finding*	*Positive*	*Negative*	*Neither*
McGuire, Sundgren & Schneeweis (1988)	Prior financial performance is a better predictor of corporate social responsibility		1	
Wilkinson (1989) – S.A. study	High profitability measured in accounting terms does not correlate with a high corporate social responsibility, but when measured in market terms it does correlate.			1
		–	1	1

Table2-3

Studies that examined other studies

Study	*Finding*	*Positive*	*Negative*	*Neither*
Arlow & Gannon (1982)	No relationship		1	
Ullmann (1985)	No clear tendency		1	
		–	2	–

Table 2-4

Studies that compared disclosure and financial performance

Study	*Finding*	*Positive*	*Negative*	*Neither*
Freedman & Jaggi (1988)	No relationship for total sample, positive correlation for oil refining industry		1	
Belkaoui & Karpik (1989)	Inconclusive			1
Patten (1991)	No significant association		1	
Hackston & Milne (1996)	No significant association		1	
		–	3	1

Table 2-5

Study that used meta-analysis

Study	*Finding*	*Positive*	*Negative*	*Neither*
Capon, Farley & Hoenig (1990)	Positive correlation	1		

Table 2-6

Summary of findings

Type of study	*Positive*	*Negative*	*Neither*
Empirical research using accounting numbers as measures of financial performance	4	4	1
Empirical research using stock market measures as measures of financial performance	5	2	–
Empirical research using both accounting numbers and stock market measures as measures of financial performance		1	1
Empirical research comparing social disclosure and financial performance		3	1
Empirical research using meta-analysis (social responsibility one factor out of twenty-five tested)	1		
	10	10	3
Studies examining other studies due to inconsistencies		2	
	10	12	3

Table 2-7

From the table 2-7 it can be seen that researchers who used stock market measures as measures for financial performance, were the most successful to prove a positive relationship between environmental (or social) responsibility and financial performance. For those that used accounting numbers one half proved a positive relationship and the other half had negative findings. One study found the

median level of environmental performance to be the most profitable (indicated as "neither" in above table).

Two studies used both accounting numbers and stock market measures as measures for financial performance. One came to a negative conclusion and the other found the accounting numbers measures proved negative and the stock market measures positive (indicated as neither in above table).

The studies comparing social disclosure and financial performance had negative findings except for one finding that was contradictory (indicated as neither in above table). These negative findings may indicate that using social disclosure as a measure of environmental responsibility may not be acceptable. Whether social (including environmental) disclosure can be used as a measure for environmental responsibility will be discussed in chapter 3.

The two studies that examined other studies due to the inconsistent results in this field of research had overall negative findings. The study that performed a meta-analysis to determine various factors that impact on financial performance found that social responsibility is positively correlated.

From the above-mentioned it is clear that further research is necessary to determine the relationship between environmental responsibility and financial performance, especially where accounting numbers are used as a measure for financial performance. However, it will be of the utmost importance to use the most appropriate measures for environmental responsibility and for financial performance respectively. This will be discussed in chapters 3 and 4 respectively.

2.6 SUMMARY AND CONCLUSIONS

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 stakeholders interested in environmental reporting are society; governments and their agencies; local communities; customers; suppliers and other trading partners; employees; investors, lenders and insurers as well as 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.

CHAPTER 3

ENVIRONMENTAL RESPONSIBILITY

3.1 INTRODUCTION

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 (Pelser & Van Rensburg 1997: 169). Many contemporary environmentalists have accused the Judeo-Christian tradition of containing "the historical roots of our ecological crisis" (Enderle 1997:176). According to Pelser & Van Rensburg (1997: 169 – 170) the Western view of life can be traced back to Judeo-Christian times and 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.

"Christian environmental stewardship" is strongly embodied in the document, *Peace and justice for the whole creation* (1989), of the European Ecumenical Assembly. The document declares "we have to reconsider the prevailing ethics of recent centuries, which, in contrast to the real meaning of the Word of God, allowed humanity to dominate the creation for its own ends, when, on the contrary, humanity should act as steward in service – service both of God and of creation itself..". (Enderle 1997: 177.)

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. Some industrialized countries, for example Germany and the U.S.A., is experiencing such a paradigm shift since the late 1980s resulting in a cultural revolution. (Pelser & Van Rensburg 1997: 170).

It is necessary to understand what environmental responsibility is before the relationship between environmental responsibility and financial performance measures of companies can be investigated. In this chapter environmental responsibility is defined, the elements of environmental responsibility are discussed, including the pressures on companies and employees to be environmentally responsible as well as the progress that companies have made. Studies that attempted to measure the level of environmental responsibility are reviewed.

3.2 DEFINING ENVIRONMENTAL RESPONSIBILITY

According to Walden & Schwartz (1997: 129) corporate social responsibility is not easy to define due to diverse interpretations of the principle of corporate social responsibility and ultimately environmental responsibility as well. They refer to Davis (1973) who noted that social responsibility "refers to the firm's consideration of, and response to, issues beyond the narrow economic, technical, and legal requirements of the firm". It simply "begins where the law ends".

After considering a few definitions of corporate social responsibility, Huckle (1995: 11) adapted Davis & Blomstrom's (1975) definition to provide the following definition of corporate environmental responsibility:

> "The obligation of decision makers to take actions which protect and improve the environment as a whole, along with their own interests."

Van Niekerk (1998: 31) chose Anderson's (1989) definition of social responsibility for the purposes of her study which reads as follows:

> "…social responsibility is the obligation of both business and society (stakeholders) to take proper legal, moral-ethical, and philanthropic actions that will protect and improve the welfare of both society and business as a whole; all of this must of course be accomplished within the economic structures and capabilities of the parties involved".

Erasmus (1998: 1) concentrated on the environment and employees as facets of social responsibility and chose the following definition after taking the above definition into account:

> "The social responsibility of enterprises encompasses the attitude of enterprises to do business in accordance with the ethical and moral standards acceptable to society".

DesJardins (1998: 826), co-editor of *Contemporary issues in business ethics,* discussed the classical model, the neo-classical model and the sustainable development model of corporate social responsibility. The classical model is succinctly captured in the following quotation from Milton Friedman (1962):

> "There is one and only one social responsibility of business – to use its resources and engage in activities to increase its profits so long as it stays within the rules of the game, which is to say, engages in open and free competition, without deception or fraud".

The classical model incorporates legal constraints while the neo-classical model includes moral constraints as part of its limits. The neo-classical model seeks to overcome the obvious ethical deficiencies of the classical view by focusing on a "moral minimum". The moral minimum is interpreted in different ways by different versions of the neo-classical model, for example Norman Bowie (1990) favours "avoiding harm" as the moral minimum. (DesJardins 1998: 828; 831.)

DesJardins (1998: 829) criticizes the neo-classical model 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. He is a supporter of the sustainable development model that seeks to combine the natural constraints established by ecological laws with minimal moral constraints placed upon business activity. Economist Herman Daly is a well-known defender of sustainable economics. His

view is that the distinction between “development” and “growth” is at the heart of sustainable economics:

> “To *grow* means ‘to increase naturally in size by the addition of material through assimilation or accretion’. To *develop* means ‘to expand or realize the potentialities of; to bring gradually to a fuller, or better state’. When something grows it gets bigger. When something develops it gets different. The earth ecosystem develops (evolves), but it does not grow. Its subsystem, the economy, must eventually stop growing, but can continue to develop. The term ‘sustainable development’ therefore makes sense for the economy, but only if it is understood as ‘development without growth’.”

(DesJardins 1998: 831 – 832.)

According to Enderle & Tavis (1998: 1134) 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”. They state corporate responsibility in the environmental realm as being committed to sustainable development by consuming less natural resources and burdening the environment less with effluents.

Bowman & Haire (1975: 54) argued that corporate social responsibility (for purposes of this study read environmental responsibility) is a signal of the presence of a style of management that extends broadly across the entire business function and leads to a more profitable operation.

The environmental impact of manufacturing processes and products, environmental regulation, and initiatives undertaken in environmental management and technology must be considered when determining the corporate strategy towards the environment. As one integrative element of corporate strategy, environmental management affects environmental performance. (Klassen 1995: 1201.)

According to Veroutis & Aelion (1996: 61) planning the strategy for a company's environment-related activities is a function of not only where the company is but also where the company wants to be in terms of its environmental performance. They broke down environmental responsibility into the following different environmental positioning options:

Compliant positioning

This position requires environmental spending to be prioritized on the basis of following legal requirements. It is a responsive approach to regulatory mandates.

Informed positioning

This position is similar to compliant positioning but includes an effort to remain informed on developments in the environmental arena. It is a responsive approach to regulatory mandates with the added flexibility and advanced warning afforded by being informed of developments.

Market-driven positioning

This position is responsive to market place, not just regulations. It involves compliance with regulations and keeping abreast of regulatory developments, as well as non-regulated voluntary environmental performance improvement initiatives, if that will help to maintain market position. This is a "safe" approach in terms of resource allocation, as the company will only spend where the market has determined that there will be a recognized benefit.

Competitive advantage positioning

This position is practised by companies trying to drive the market from the environmental perspective to determine where the market will head if the approach it takes is widely adopted. This proactive positioning involves higher investment

risk stemming from the possibility that the market may not follow the lead of that company.

Sustainable development positioning

Companies selecting this proactive position invest with the intention of improving their environmental performance in conjunction with fulfilling their social responsibilities and maintaining their economic health, to ensure sustainability of the company and natural resources, and increase environmental or other benefits for their stakeholders.

(Veroutis & Aelion 1996: 62.)

Roome (1994: 19) suggested that education and training for environmental awareness should recognize the roles and responsibilities of students as individuals, as managers and as citizens. Environmental education should therefore encourage all students to have an:

- Understanding of the concept of sustainability, the values implied by and responsibilities that stem from sustainability, and recognition of the implications for individual and organizational behaviour of working towards that concept;
- understanding of the main principles and interconnections of the earth's resources, support systems and processes, at local and global level;
- understanding of the importance of individual and organizational vision, thinking and perspective which matches the complexity and interconnections of environmental and social systems;
- awareness of the contribution and limitations of legal, economic and technical systems to the attainment of sustainability;
- recognition of the contribution and limitations of management systems, organizational designs and organizational cultures in the attainment of sustainability;

- knowledge of the assumptions and approaches used in environmental management techniques which measure, monitor and control environmental impacts, such as environmental impact assessment, environmental reviews, environmental auditing, accounting and reporting and life-cycle analysis;
- development of the ability to exercise critical judgement, to initiate or support innovative action and to empower others to achieve these ends;
- development of the skills to lead, participate in and implement programmes for the management of change and to support the process of adaptation towards sustainability.

(Roome 1994: 19 – 20.)

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.

3.3 ELEMENTS OF ENVIRONMENTAL RESPONSIBILITY

3.3.1 Pressures towards environmental responsibility

Stakeholders interested in environmental reporting (refer to section 2.3) are placing increasing pressures on companies to be environmentally responsible.

Moves towards stricter and even retrospective legislation, as well as the possibility of U.S.-style lawsuits against directors becoming commonplace in Europe have come partly in response to corporate arrogance towards environmental responsibility. Many offending companies have reacted inappropriately to fines, treating them as running costs rather than taking the anti-pollution legislation seriously. The legislators responded with laws that allow criminal action against individuals, putting pressure on senior executives to take responsibility for their company's actions. (Cozens 1996: 47.)

Court rulings have not imposed liability on individuals solely because of their role as an officer or director, but due to personal participation in an unlawful activity, or because of their ability to control the corporation's disposal of hazardous material (Freeman 1994: 61). According to Jeremy A. Gibson, an attorney with a Chicago law firm, the courts rely on three main legal tests for finding individuals liable:

- *Direct participation*

  An individual engaged in improper or illegal conduct that is involved directly with a release or disposal will not be protected by a corporate entity.

- *Management or control*

  Not only individuals who participate directly in wrongdoing, but also those who supervise environmental management specifically, or facility management generally could be found personally liable.

- *Prevention*

  If an individual could have prevented the harm from occurring he or she will be liable.

(Anonymous 1995: 13 – 14.)

The United States' Department of Justice is serious about criminal prosecution. From the beginning of 1983 to July 1995 environmental criminal indictments against 1 458 corporate and individual defendants and 1 063 (73%) guilty pleas and convictions were recorded. Of the 1 063 convictions, 331 were against organizations, and the remaining 732 (69%) were against individuals. In 1993 alone, 186 companies were indicted of which 168 (90%) were convicted. (Millner 1995: 37.)

Along with the increase in prosecutions have come greater fines and jail terms for environmental violations. The increase in jail sentences has been dramatic. Each year between 1982 and 1989 the courts issued to corporate managers, on average, a total of fewer than 35 years in jail terms. By 1993 this average had more than doubled to a total of 80 years and for 1994 it was 99 years. According

to the then federal district attorney Richard Thornburgh, the use of criminal sanctions has become one of the most effective means of deterring non-compliance. (Kubasek 1996: 64.)

The due diligence defence was established by the Bata case in Canada (1992). In this precedent-setting case the court made it clear that due diligence will always be a matter of the particular circumstances of the case. The highest duties are imposed on operational directors, slightly lower standards on managerial directors, and the lowest standards on outside directors. The defence puts the burden on the defendant to prove that the manager or company has been duly diligent in attempting to prevent the commission of the environmental violation. The establishment of due diligence requires active environmental policies on the part of the company and the responsible individuals it employs. A successful due diligence defence requires that companies had constructed an efficient system designed to avoid the commission of environmental offences and that the proper operation of that system is ensured. (Kubasek 1996: 66.)

European environment ministers were recently admonished to step up efforts to ensure that their environmental policies actually help the environment. A report from the Copenhagen-based European Environment Agency says just one of 12 problem areas has improved during the last five years. U.K. businesses may face new legislation to clean up their environmental acts. (Anonymous 1998: 13.) According to Gallagher (1998: 5) a new driving force for cleaner technologies, waste minimization and the re-use and recycling of materials will come from changes in taxation. These changes will undoubtedly put pressure on some industries. He is of the opinion that the environment will play an increasingly large part in transforming industry and society within the lifetime of this and the next generation of business leaders.

The pressure for companies to take a more holistic approach to environmental management, and specifically to reduce the environmental impacts of their activities is increasing in the U.K. Environmental regulations are becoming more stringent, new policy instruments such as green taxes and charges are being

implemented and the expectations of customers and local communities and demands for responsible corporate environmental governance are also increasing. The quality of a company's environmental management is increasingly seen as an indicator to the outside world of the overall quality of its management. (Howes 1999: 32 – 33.)

In the U.S. the pressure towards a holistic approach to compliance is evidenced by the Environmental Protection Agency and state agencies who are beginning to regulate air, water, and solid waste in concert. An example of this "multimedia" approach is the Cluster Rule, which addresses wastewater and volatile air pollutants in the pulp and paper industry. Merely moving a pollutant from one medium to another is a solution of the past. (Parsons & Coyne 1998: 54.)

According to Williams (1999: 65) direct pressures on organizations include new legislation or regulation as well as pressures that are marginally short of legislation but almost equally effective. An example is the pressure for better environmental reporting by companies with the threat of legislation if a solution is not voluntarily found which is acceptable to the U.K. government.

Indirect pressures noted by Williams (1999: 65) are customer opinion (especially if the organization has a consumer brand to protect), pressure exerted by institutions such as banks and insurance companies, as well as organizations that are increasing awareness by selling advice on the new problems.

Bennett & James (1998: 20) are of the opinion that worsening environmental problems will increase pressures on business. They provide the following examples of such pressures:

- A growing number of energy and environmental taxes, such as the UK's landfill tax and a possible "carbon" tax on fossil fuels;
- large financial liabilities resulting from civil and criminal actions related to accidents or long-term environmental effects;
- damage to reputation and/or additional costs resulting from pressure group

campaigns;

- "sunsetting" of products (and opportunities for "sunrise" replacements) as a result of environmental legislation;
- evidence that some manufacturing companies have "costs of inefficiency"; and
- increased costs of capital for companies with poor environmental performance because investors and lenders demand a higher risk premium.

According to Sharfman, Ellington & Moe (1997: 14) there are pressures for similarity between companies, being coercive (having the rule of law or markets behind them), normative (professional organizations putting forth value-laden pressure), or mimetic (actions of leading firms inducing imitation by other firms).

Another source of pressure on companies comes in the form of procurement practices. Many U.S. federal contracts now contain clauses requiring contractors to investigate and monitor the environmental performance of sub-contractors and vendors. Some companies have adopted such practices on their own, without a federal mandate. Large manufacturers are developing criteria for selecting environmentally responsible suppliers and standards to which they must adhere. (Fenn 1995: 62.)

South African business must work with authorities to plot a relevant course that meets both our own challenges and global responsibilities. It must also take cognisance of the growing sensitivity of European businesses to competition from developing world countries which they perceive to be unregulated. European companies are being squeezed by ever tighter regulations and despite the efforts of world trade organizations environment can become a non-tariff trade barrier. (Anonymous 1997: 9.)

The polluter pays principle (refer to section 2.3.2) and the precautionary principle (if there is uncertainty as to the composition or hazardous nature of a given waste, action should be cautious and based on a worse-case-scenario assumption) are

guiding principles for future waste management legislation in South Africa. These principles strongly suggest that future waste management legislation will place heavy responsibility with waste generators in relation to the generation, transport, treatment and disposal of their waste. (Noble 1997: 34.)

3.3.2 Progress made by companies

Beaumont, Pedersen & Whitaker (1993: 253) state the following: “There is no longer debate about the existence of interlocking environmental crises and that “business-as-usual” is sustainable. Business is both a major cause of the problems, and their main source of solutions. Business has a responsibility to act, and, by so doing, can realize new business opportunities. The greater incidence of an environmental consciousness among business people in recent years gives some signals for hope, but there will not be any real progress until it is translated into action. While the complex environmental pressures require co-ordinated policy and action, the decisive forces must be driven by business.”

According to Ferrone (1996: 41) we are in the early stages of transformation from non-integrated systems to integrated eco-efficient systems that control material flow in product creation for the benefit of both the environment and the bottom line. Allen Aspengren (Global Eco-efficiency Manager at 3M), describes eco-efficiency as “the next step” for companies who are seeking to optimize their environmental performance. He notes that eco-efficiency encompasses life cycle analysis and includes concepts like pollution prevention and cleaner production in trying to develop a philosophy that your products can be sustainable while also being profitable. (Anonymous 1996: 4.)

The rapid changes occurring in corporate environmental management during the 1990s may validate predictions about a new industrial revolution by environmentally conscious business leaders, for example Schmidheiny who said: “It is the most forceful trend in my lifetime. It will reshape business because it will redefine the rules of the game.” 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. (Berry & Rondinelli 1998: 38; 41.)

3.3.2.1 Environmental management systems and environmental audits

Companies are adopting environmental management systems to look at the impact of their businesses' entire operation. Britain was one of the first countries to develop a national standard (BS 7750) for environmental management systems. Certification to BS 7750 or ISO 14001 (which replaced BS 7750), is a public statement that a company is meeting its environmental responsibilities. (Pritchard 1997: 24 – 25.)

The International Standards Organization (ISO) issued ISO 14000, a set of voluntary standards for environmental management systems that provides flexible guidelines on maintaining a management system that will ensure compliance with environmental laws and regulations while promoting continuous improvement in environmental performance. Demand for these standards arose from a world-wide recognition by companies that economic growth is adversely affecting the environment. (Tucker & Kasper 1998: 344.) These standards define common criteria for a wide variety of industries that are recognized from one country to the next, removing technical barriers to trade (Wilson 1997: 37).

Some companies have dealt with potential liabilities by systematically assessing their environmental compliance efforts by using environmental audits. The audit process results in an environmental profile that shows whether the company satisfactorily complies with regulations and whether the potential for future non-compliance exists. (Chilcutt 1995: 41.)

However, the focus of the standards being developed is on environmental management system audits, for example ISO 14000 describes environmental

responsibility in terms of a management system and states that the purpose of the audit is to verify that the system is operating as intended. Environmental management system (EMS) audits have the following advantages over other types of environmental audits:

- EMS audits consider whether the management system is in place to ensure compliance on a continuous basis;
- EMS audits seek to discover and explain why non-compliance is occurring; and
- EMS audits provide a defence were the company ever cited for violation of an environmental law.

(Tucker & Kasper 1998: 348.)

The Justice Department of the United States will not prosecute violations of environmental statutes discovered through self-audits that are then reported to regulators and corrected. Although this policy was created to provide incentives to undertake voluntary audits, the Environmental Protection Agency retains discretion to recover the economic benefit a company gains from non-compliance. (Chilcutt 1995: 42.)

3.3.2.2 Environmental risk assessment

An environmental risk assessment survey (ERAS) is a highly effective method of identifying potential exposures associated with a facility's operations and procedures. Where a compliance audit simply measures if and where regulations are being met, an ERAS measures compliance, identifies significant and subtle areas of risk, and then recommends an appropriate risk management programme, such as who to contact in the case of a spill or what steps to take to prevent contaminants from spreading to surrounding areas and incurring further liability. (Piatkowski 1997: 72 – 73.)

A risk assessment study is a valuable loss prevention tool for site remediation. By conducting their own assessments using site-specific data, companies have proven that regulatory assumptions often seriously overstate site risks (or pollution from facility operations). One company avoided $14 million in cleanup costs by investing $100 000 in a risk assessment study. (Parsons & Coyne 1998: 53.)

3.3.2.3 Environmental reporting

The overall number of companies producing environmental reports is still relatively small, particularly outside the global mega-sized companies, but are increasing steadily. A survey of the U.S. Fortune 500 companies indicated that at least 20% of companies produced environmental reports in 1996. In the U.K. KPMG published its fifth survey of environmental reporting by the FT Top 100 companies in 1997. Although nearly 80% of these companies are providing some environmental information in their annual reports, only 30% (up from 20% in 1993) are issuing separate environmental reports and only a third of these reports had been externally verified. (Webb 1998: 32.)

The volume of social reporting in the U.K. has shown very rapid growth since 1986. South Africa appears to have reached the point of rapid increase sometime between 1992 and 1997. The current trend in the U.K. may indicate where South African social disclosures are headed during the next six to eight years. (De Villiers 1999: 8 – 9.)

Accounting for environmentally sustainable profits is a research project currently investigating how companies can develop more integrated and complete management and financial accounting and reporting systems that specifically take into account the most significant environmental impacts resulting from their activities. Interface Europe Ltd is the case study company for the project. *The 1997 Benchmark Survey, the third international progress report on company environmental reporting* by Sustainability/United Nations Environment Programme suggests that the monitarization/valuation of environmental impacts and their

integration into corporate accounting will become an increasingly important issue. (Howes 1999: 32 – 33.)

3.3.2.4 Full-cost environmental accounting

According to Berry & Rondinelli (1998: 44 – 45) the concept of environmental cost has had two major dimensions until recently. Environmental costs could refer to costs that directly affect a company's bottom line or to the costs to individuals, society, and the environment for which the firm is not accountable. The emergence of full-cost accounting is beginning to reshape the concept of environmental accounting and making it essential to business success.

Full-cost accounting (FCA) identifies and quantifies environmental performance costs for a product, process, or project. FCA considers four levels of costs:

- Direct costs, such as labour, capital, and raw materials;
- hidden costs, such as monitoring and reporting;
- contingent liability costs, such as for fines and remedial action; and
- less tangible costs, such as public relations and goodwill.

(Berry & Rondinelli 1998: 45.)

Many companies do not track or measure environmental costs and therefore do not know what their true environmental costs are. Conventional accounting practices often hide costs associated with environmental compliance in general overhead accounts. The result is that these costs are not managed and can have a negative effect on the bottom line that is unnecessary. (Carrera & Iannuzzi 1998: 64.)

Companies can use full-cost accounting (FCA) not only to determine the financial impact of their environmental activities, but also to find less costly alternatives by changing process or product design, increasing prices, or developing an exit strategy to eliminate environmentally costly products (Berry & Rondinelli 1998: 45.)

Companies that are serious about getting a handle on their true environmental costs have initiated some form of environmental cost accounting. Ontario Hydro, a large utility in Canada, has made FCA one of the cornerstones of its sustainable development strategy. By better understanding the internal and external environmental costs associated with its activities, quantifying those costs, and incorporating this information into planning and decision-making, Ontario Hydro expects to be in a better position to fulfil its sustainable development mission and enhance its competitiveness. (Carrera & Iannuzzi 1998: 64.) Corporations like Dow Chemical, DuPont and Ciba Geigy are using FCA to identify, quantify, and allocate the direct and indirect environmental costs of ongoing operations (Berry & Rondinelli 1998: 45).

Companies that embrace product stewardship (refer to section 3.4.9.) apply the principles of environmental cost analysis to everything from product design to packaging and shipping. Xerox achieved excellent results with this cradle-to-grave approach: By using an exceptionally detailed environmental cost analysis the company was able to produce a copier that is more environmentally friendly throughout its life with 98% of the product being recyclable. They also found a more effective way to make the copier, reducing the number of parts in the device from 2 000 to 250. The machines are easier to service because only two types of screws are used. (Dutton 1998: 60 – 61.)

3.3.2.5 Total quality management

In the late 1980s proactive environmental management and the total quality management (TQM) movement began to converge. TQM initiatives gave companies unexpected insights into how to make environmental management cost-effective and market-driven. (Berry & Rondinelli 1998: 41.)

Stiff competition and ever-rising worker compensation premiums forced many leading companies to achieve near-perfect performance in the areas of product quality, inventory management, preventive maintenance, and worker health and safety. They essentially reduced product defects, downtime, and worker injuries to

zero. This was accomplished by using TQM. Environmental departments can eventually reach this same level of performance. The first steps are to reduce waste and pollution to virtually zero but the ultimate goal is to attain complete environmental sustainability by imposing “zero drain on the natural economy”. True sustainability is still years away, and will require the development of new technologies that can maximize the usefulness of renewable energy and materials. Several companies are already taking steps in that direction. (Anonymous 1998: 1 – 4.)

3.3.2.6 Pollution prevention

Pollution prevention focuses on minimizing or eliminating waste before it is created. Much like TQM, pollution prevention strategies depend on continuous improvement efforts to reduce waste and energy use. This transformation is driven by a compelling logic: pollution prevention pays. (Refer to section 2.4.2 for examples.) Emerging global standards for environmental management systems (for example ISO 14000) have also created strong incentives for companies to develop such capabilities. (Hart 1997: 71.) Berry & Rondinelli note that in the 1980s a growing number of businesses began focusing on, anticipating and preventing waste problems before they occurred.

BASF, the German chemical giant, is helping to design and build chemical industries in China, India, Indonesia, and Malaysia that are less polluting than in the past. By co-locating facilities that in the West have been geographically dispersed, BASF is able to create industrial ecosystems in which the waste from one process becomes the raw material for another. Co-location solves a problem common in the West, where recycling waste is often infeasible because transporting it from one site to another is dangerous and costly. (Hart 1997: 71.)

3.3.2.7 Demand-side management

According to Berry & Rondinelli (1998: 43) demand-side management is an approach to pollution prevention that originated in the utility industry. It focuses on

understanding customers' needs and preferences and on their use of products, and is based on the following principles:

- Do not waste the product (electricity);
- sell exactly what the customer demands; and
- make the customer more efficient in the use of the product.

Demand-side thinking emphasized that utility companies are not primarily in the business of selling electricity or gas, they are really in the business of selling environmental conditions such as comfort, brightness, and conveyance. By looking at the market in terms of real demand, utilities can prosper by providing customers with a variety of environmentally beneficial services, and not just electricity or gas. Another example is Monsanto who has developed genetically bio-engineered plants, such as potatoes and cotton, that are protected against disease and insects. Building protection into plants genetically obviates the need for millions of pounds of raw materials and enormous amounts of fossil fuels for energy to produce pesticides, hundreds of thousands of containers and packages that require disposal, thousands of litres of fuel to distribute and apply the product, and millions of kilograms of pesticide residue that pollute land and water. (Berry & Rondinelli 1998: 43.)

3.3.2.8 Design for environment

Design for environment is becoming an integral part of pollution prevention in proactive environmental management. Businesses are finding it far more efficient to design products for disassembly, modular upgradeability, and recyclability at the outset than to deal with disposal problems at the end of a product's life. (Berry & Rondinelli 1998: 43.)

Steelcase Inc. is a leader in industrial design and environmental responsibility as evidenced by 29 design awards in 10 years. Steelcase linked its "design for environment" focus with an equally strong "design for manufacturing" perspective in the development of the Protégé chair. The development of this chair identified

key elements of a cohesive, environmentally responsible product development initiative and led to the creation of a formal “design for environment” tool for use in future development efforts. (Quinn 1997: 23 – 24.)

Discarded electronic consumer products cause enormous environmental problems as no thought were given to their possible reuse when they were designed 15 – 20 years ago. Some European governments have passed laws to make manufacturers and importers responsible for their products when discarded by the consumer. Therefore, manufacturers have started to think about product designs which allow the reuse of components and the recycling of materials. (De Ron & Penev 1995: 363.)

3.3.2.9 Product stewardship

Berry & Rondinelli (1998: 44) define product stewardship as practices that reduce environmental risks or problems resulting from the design, manufacturing, distribution, use, or disposal of products. According to Hart (1997: 72) product stewardship focuses on minimizing not only pollution from manufacturing but also all environmental impacts associated with the full life-cycle of a product. He describes design for environment as a tool for product stewardship that is becoming increasingly important.

Companies are responding to the European takeback laws by using product life-cycle analysis to determine ways of reducing or eliminating waste at all stages – from raw materials acquisition, production, distribution, and consumer use to waste reclamation, recycling, reuse, and disposal. (Berry & Rondinelli 1998: 44.)

3.3.2.10 Clean technology

The existing technology base in many industries is not environmentally sustainable. The chemical industry has made substantial headway over the past decade in pollution prevention and product stewardship, but is still limited by its dependence on the chlorine molecule. (Many organochlorides are toxic or

persistent or bioaccumulative.) As long as the industry relies on its historical competencies in chlorine chemistry, it will have trouble making major progress toward sustainability. (Hart 1998: 73.)

Japan's Research Institute for Innovative Technology for the Earth (RITE), financed and staffed by the Japanese government and more than 40 corporations, is one of several new research and technology consortia focusing on the development and commercialization of clean technologies for the developing world. RITE has set forth an ambitious 100-year plan to create the next generation of power technology, which will eliminate or neutralize greenhouse gas emissions. (Hart 1998: 73.)

3.3.2.11 Responsible care

The Canadian Chemical Producers' Association took the lead in setting up an *Initiative for Chemical Industry* (called *Responsible Care*) in 1984 to commit itself to both a set of guiding principles and to a series of management practice standards which form the basis of how chemicals are to be managed (Lotter 1996: 20). In 1994 this initiative was adopted by 15 South African chemical companies. This number has since grown to 120, accounting for 90% of the chemicals manufactured in South Africa. The principles of Responsible Care include integration of health, safety and environmental considerations into business processes. (Lotter & Gerrans 1998: 8.)

3.3.2.12 Green alliance

"Green alliance" partnerships between businesses and environmental groups are proving to be effective strategies for integrating corporate environmental responsibilities with market goals. They are a consequence of an emerging philosophy called "Market-based Environmentalism" which advocates making ecology attractive to business via market incentives. (Hartman & Stafford 1997: 184.)

Internationally, Greenpeace has adopted the slogan “Whatever it takes” as its environmental directive. Allying with businesses to solve ecological problems and help companies become environmentally responsible is now an integral part of its arsenal of eco-tactics, along with non-violent demonstrations, research and public opinion shaping. They allied with Foron, a former East German appliance maker on the verge of insolvency to launch the award-winning, environmentally-friendly “Clean Cooler” refrigerator which won Germany’s prestigious “Blue Angel” award and came to dominate the eastern German market. Greenpeace provided Foron with an “early mover” advantage against its larger, western German competitors who ultimately followed Foron’s lead. (Hartman & Stafford 1997: 184.)

Partnering with environmentalist organizations is becoming a viable green strategy for many companies that do not possess the expertise or public trust to address adequately environmental problems. Corporate executives and environmentalists are burying the hatchet and finding economic and ecological advantages through cooperation. Green alliance partners include The Body Shop International and the World Wildlife Fund, General Motors and the Coalition for Environmentally Responsible Economies and McDonald’s and the Environmental Defense Fund.

3.4 MEASURING ENVIRONMENTAL RESPONSIBILITY

It is crucial to attempt to measure environmental responsibility as appropriately as possible for the purpose of establishing what the relationship between environmental responsibility and financial performance measures is. The following studies give some indication of what measures to use when measuring environmental responsibility:

Ingram (1978: 283) found that the information content of firms’ social responsibility disclosures is conditional upon the market segment with which the firm is identified. He suggested that it may be important to evaluate information content by analyzing the impact of the signals on market segments (or segments identified by firm-specific characteristics), rather than on a general cross-section of firms.

Abbott & Monsen (1979: 514 – 515) attempted to develop a social involvement disclosure scale based on a content analysis of the annual reports of the *Fortune 500* . 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 & Frazier (1980: 616) 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. They set the following requirements for categories:

- Categories must be defined as precisely as practicable so that different judges could be expected to arrive at the same results with the same material.
- Each set of related categories should be exhaustive and mutually exclusive and defined as such.

Wiseman (1982: 62) attempted to measure and evaluate voluntary environmental disclosures made by companies in their annual reports in order to provide preliminary evidence on the relationships between objective measures of a firm's environmental disclosure and the firm's actual environmental performance. She found that voluntary environmental disclosures were incomplete, providing inadequate disclosure for most of the environmental performance items included in the index. She also found that no relationship existed between the measured contents of the firms' environmental disclosures and the firms' environmental performance.

Wiseman (1982: 55) 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. She identified 18 index items from the environmental reporting literature and developed a rating sheet to measure the extent of disclosure of those items. The items were classified into four categories. Rating

of the disclosures was based on the presence or absence and the degree of specificity of each of the information items. A score of three (highest possible) was assigned to an item if it was described in monetary or quantitative terms. A score of two was assigned if company specific information was disclosed in non-quantitative terms. One was assigned to items mentioned only in general terms. A zero was assigned if the item was not present in the disclosure.

Cowen, Ferreri & Parker (1987: 121) found that discussion of only the total number of corporate social responsibility disclosures (as has occurred in the past) might be misleading. Different types of disclosures may receive different treatment from corporations and may constitute a response to different pressures.

Belkaoui & Karpik (1989: 46) found a significant and positive association of social disclosure with social performance which they said shows that social improvements by a firm are quickly capitalised by social disclosure in an attempt to create an impression of sensitivity to important non-market influences that may be in the long-term interest of the shareholders. They also found it interesting that those studies finding no correlation or negative correlation between social performance and social disclosure rely on either student ratings or on the CEP pollution performance index. Both indices do not measure social performance *per se*, but rather perceived social performance by individuals who cannot be considered constituents, or pollution control records which do not represent overall effectiveness (Ullmann 1985: 544).

According to Klassen (1995: 48) measures can be classified as either *objective,* reported by external organizations or government databases, or *perceptual*, based on environmental reputation as evaluated by some collection of peers. For his study he chose an objective measure (reported in the EPA TRI darabase) given the significant weaknesses of perceptual measures of environmental performance (Klassen 1995: 52).

Huckle (1995: 47 – 48) used content analysis as a measure of environmental responsibility as well as reputational ratings to validate the results of the content

analysis. The reputational rating was based on the views of the investment analysts and portfolio managers responsible for the relevant sectors of the J.S.E. He found a poor correlation between the two measures that suggested a lack of validity and expressed the hope that a better, more sophisticated measure of environmental performance could be developed.

Erasmus used a control list to do a content analysis of the reporting on environmental issues in the annual financial statements of companies listed on the J.S.E. She applied a judgement scale to the results of the control list to evaluate the quality of environmental reporting. This control list and judgement scale was based on the control list and judgement scale used by Van Niekerk (refer below). (Erasmus 1998: 85; 255.)

Erasmus (1998: 181) compiled a questionnaire with questions that are comparable to the topics in the control list. This questionnaire was send it to all companies listed on the J.S.E. during 1997 in order to compare a company's actual performance relating to the environment to its environmental reporting in the annual financial statements (Erasmus 1998: 182; 256).

Although Erasmus (1998: 266 – 268) found that there is a poor relationship between environmental reporting in the annual financial statements during financial years ended 1994, 1995 and 1996 of J.S.E listed companies and their actual environmental performance, she also found that since 1994 there has been a constant increase in the percentage of companies that report on environmental issues, as well as that the quality of environmental reporting is improving.

After considering studies criticizing environmental disclosure in annual financial statements as well as studies motivating the use of annual financial statements as main source of information relating to environmental responsibility Van Niekerk (1998: 66 – 68) came to the conclusion that there is overwhelming evidence that researchers view annual financial statements as the most important source of information with respect to environmental reporting; therefore she decided to use annual financial statements for the purposes of her study.

Van Niekerk (1998: 62, 69) compiled a control list comprising of 23 questions, based on a control list developed by Bogiages & Vorster (1993) to evaluate the environmental information that companies disclose in their annual financial statements. The recommendations of the Institute of Chartered Accountants of England and Wales were used as foundation for the development of this control list. Van Niekerk developed a scale to judge the quality of the environmental information that was gathered by using the control list. With these two measures she ranked companies from high to low according to the quantity and the quality of their environmental information.

The control list and judgement scale used by Van Niekerk is presented respectively in Appendix 1 and 2.

The questions in the control list are categorized as follows:

- Policy/mission statement regarding the environment;
- environmental objectives;
- environmental activities;
- environmental reporting; and
- audit reports.

(Van Niekerk 1998: 69.)

Van Niekerk (1998: 85) considered the methods of work of researchers who wanted to judge the information in annual financial statements objectively. She noted that the control lists and judgement scales of Cerf (1961), Singhvi & Desai (1971) and Buzby (1974) were based on general information in the annual financial statements while the judgement scales of later researchers like Ingram & Frasier (1980), Wiseman (1982), Freedman & Jaggi (1986), Gamble, Hsu, Kite & Radtke (1995) and Fekrat, Inclan & Petroni (1996) were more specifically aimed at the disclosure of environmental information in the annual financial statements.

Van Niekerk (1998: 87) used the categorizing of Ingram & Frasier (1980) as the starting point for the development of her judgement scale. Ingram & Frasier (1980: 616) identified four dimensions and 20 categories of which Van Niekerk used three dimensions and 10 categories as set out below.

Van Niekerk (1998: 88) judged every question in the control list according to the following 10 categories that is spread over the dimensions of evidence, time and specificity:

Evidence	*Time*	*Specificity*
Monetary	Past	Specific
Non-monetary	Present	General
Qualitative	Future	
Declarative		
None		

The potential information value of monetary values are greater than those of non-monetary values. Therefore the category *monetary* carries a greater weight than the category *non-monetary*. The comparativeness of information relating to social accounting in the financial statements of enterprises is limited by the fact that the social costs of different enterprises may differ considerably (Lubbe & Vorster 1991). Due to this limitation the category *qualitative* carries a lower weight than the category *monetary*. However, the information provided by the category *qualitative* is of paramount importance, therefore this category carries the same weight as the category *non-monetary*. (Van Niekerk 1998: 90.)

Declarative information (or narrative disclosure) does not assist investors to evaluate an enterprise's efforts to reduce activities that is harmful to the environment and the future risks relating to environmental activities (Freedman & Jaggi 1986.) Therefore the category *declarative* carries a lower weight than the category *qualitative*. (Van Niekerk 1998: 91.)

Investors' decisions are usually future-orientated, therefore the category *future* carries a higher weight than the categories *present* and *past*. As the annual

financial statements of companies were used as the source of environmental information in Van Niekerk's study, the category *specific* carries a higher weight than the category *general*. The judgement scale makes provision for one extra point over and above the basic weight for specific information in the case of questions in the control list that make provision for companies that provide specific information in respect of more than one item. In order to maintain the balance between the weights of the different questions within the various categories a maximum is applicable on the number of points for specific information. (Van Niekerk 1998: 91 – 92.)

The measures used by Van Niekerk were developed to judge the disclosure of environmental information in annual financial statements by companies listed on the Johannesburg Stock Exchange (Van Niekerk 1998: 63). As this study will also use annual financial statements of companies listed on the Johannesburg Stock Exchange and the measures are objective, these measures appear most appropriate for the purposes of this study.

3.5 SUMMARY AND CONCLUSIONS

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.

The measures used by Van Niekerk were developed to judge the disclosure of environmental information in annual financial statements by companies listed on the Johannesburg Stock Exchange (Van Niekerk 1998: 63). As this study will also use annual financial statements of companies listed on the Johannesburg Stock Exchange and the measures are objective, these measures appear most appropriate for the purposes of this study.

CHAPTER 4

FINANCIAL PERFORMANCE

4.1 INTRODUCTION

The financial performance of individual companies displays markedly different patterns over time. Some companies' profits increase, some decrease, and some show fluctuating patterns. The following examples of well-known companies illustrates the point:

Profit increases

From 1980 to 1994, General Electric's return on equity averaged 18,1% (only twice less than 16%). Profits grew from $1,5 billion to $4,7 billion, showing year-to- year increases every year except two.

In 1985 Microsoft earned $24,1 million profits on sales of $140 million; in 1995, it earned $1,45 billion on sales of $5,9 billion; profits increased every year – the mean year-to-year profit increase was more than 50%.

Profit decreases

IBM's profits were from 1982 to 1990 only once below $4 billion and were three times above $6 billion (including 1990). In the following three years IBM sustained increasingly large losses: 1991 - $2,8 billion; 1992 - $5 billion; and 1993 - $8,1 billion. Profits recovered to $3 billion in 1994.

Fluctuating profit

In 1980 General Motors lost $763 million, from 1983 to 1989 it averaged $3,94 billion in profits (maximum $4,9 billion and only once less than $3 billion), in 1991

and 1992 it lost $4,5 billion and $23,5 billion, respectively. General Motors recovered to make $2,5 billion in profits in 1993 and $4,9 billion in 1994.

(Capon, Farley & Hoenig 1996: 1 – 3.)

In this chapter profitability is defined, elements of financial performance are discussed, including the profit zone and causal factors, and various measures of financial performance are reviewed.

4.2 DEFINING PROFITABILITY

Profitability is a key component of financial performance. For the purposes of this study financial performance was defined in section 1.3 as relating more to the profitability of a company than to the possible wider interpretation of financial performance. Helfert (1991: 99) describes profitability as 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. (Helfert 1991: 102.)

4.3 ELEMENTS OF FINANCIAL PERFORMANCE

4.3.1 The profit zone

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. Companies like IBM, Kodak, United Airlines, U.S. Steel, General Motors, Ford, and a host of others succeeded fantastically in winning the market-share game 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. (Slywotzky 1998: 12.)

According to Slywotzky (1998: 12) success in today' marketplace depends on the following questions:

- How does profit really happen in our industry?
- Where is the "profit zone", that area within a specific industry in which profit is allowed?
- How should the business model be designed in order to reach and operate in the profit zone?

Profitability must be understood for each company in its own terms. Disney and Coca-Cola make their profits in very different ways but both are part of a small portfolio of companies that are referred to as "reinventors". "Reinventors" are companies who have become almost habitually customer-centric and profit-centric. They change their business design every five years and expect that process to continue. (Slywotzky 1998: 14 – 15.)

In the early 1980's Coca-Cola's business model was essentially that of a syrup maker and advertiser selling through franchise bottlers. Coke's profitability was concentrated in fountain and vending, two areas that the bottlers could reach but that the company could influence at best indirectly and in many cases not at all. By the mid-1980s Coke had shifted its U.S. business model to that of a "value chain manager". It built a very different business design by taking control of the value chain by buying controlling stakes in its bottlers, maximizing its investment in fountain and vending, and eventually rebuilding that entire business model on a global basis. (Slywotzky 1998: 13.)

The profitability problem the Disney Company faced in the mid-1980s was that it was the value creator (of content and characters) in its industry while others recaptured the majority of this value. Disney began to participate directly in the retail part of the system. Due to this move Disney was able to create an entirely

integrated system, with a series of new ancillary activities, which allowed it to maximize the value and profitability of every piece of content it created. (Slywotzky 1998: 14.)

General Electric (GE) has probably answered better than anyone else the question of how manufacturers can make money. In the early 1980s GE's business model was based on the principle of being No. 1 or No. 2 or getting out of the business because being the market share leader was the pathway to highest profitability. By the mid-1980s this was no longer true because GE's customers began to focus on getting the lowest price. The business model changed to not only being No. 1 in market share, but also securing the No. 1 position in productivity. That model worked for several years, but by the early 1990s it was not enough to create sustained profit growth. The profit was in selling the full "package", so GE began to develop services, solutions, and other ancillary activities to ensure profit growth. (Slywotzky 1998: 15.)

4.3.2 Causal factors

Although individual experts, consultants and promoters may tout a single particular element as driving superior performance, Capon, Farley & Hoenig (1996: 182) found no single factor that acts independently. A variety of key factors, drawn from several research traditions, seem to work together to produce better-than-average performance. They found that elements of environment, strategy and organization (can be divided into structure and climate or culture) are important in explaining differences in financial performance. (Capon *et al* (1996: 6) defines "environment" as the set of market, transactional and contextual factors facing a company, therefore "environment" in their work refers to more than "green environment".)

This finding is supported by the results from a meta-analysis of extant empirical work on financial performance and the empirical study of Capon *et al*. The meta-analysis showed that environment and strategy variables dominate in strength of impact, with strategy providing the most consistent effects. The empirical study

also showed that environment and strategy provide the strongest relationships, but several significant relationships for organization, especially structure, were also identified. (Capon *et al* 1996: 182.)

Capon *et al* (1996: 185) identified the following causal factors that, regardless of analytic method employed, 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.

The power of these six factors in driving financial performance was demonstrated in their exploratory use as a predictive performance tool for a single company. Using Eastman Kodak as an example, a very good fit between actual and predicted performance was secured over a 13-year period. (Capon *et al* 1996: 186.)

4.4 MEASURING FINANCIAL PERFORMANCE

According to Capon, *et al* (1996: 7) 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 (e.g. sales, profit), return-based (e.g. profit/sales, profit/capital, profit/equity), internal (e.g. profit/sales), external (e.g. market value of the firm), a level for a single period (e.g. one year), a mean or

a growth rate over several years or a variability (e.g. standard deviation) about a mean or a trend. In their empirical study they introduced firm survival as one of the measures.

According to Banker, Chang & Majumdar (1993: 35) finding useful components of performance measures is a relevant area for research. For them a major difficulty was defining the appropriate components and showing whether the interpretations that result are reasonable and applicable elsewhere.

The following measures are often used to measure financial performance:

4.4.1 Profit margin

Profit margin = Net profit after tax / Sales

This gives an indication of the profit generated for every rand of sales. A relatively high profit margin is desirable as it corresponds to low expense ratios relative to sales. A smaller margin is not necessarily bad, for example, lowering a sales price will usually increase unit volume, but profit margins will shrink. Total profit may still increase due to the increase in volume. (Ross, Westerfield, Jordan & Firer 1996: 60 – 61.)

4.4.2 Return on assets (ROA)

ROA = Net profit / Total assets

The easiest form of profitability analysis is to relate net profit to the total assets on the balance sheet. Net assets (total assets less current liabilities), which are equivalent to the total long-term sources on the balance sheet may also be used, using the argument that operating liabilities are available essentially without cost to support a portion of the current assets. (Helfert 1991: 99.)

According to Bandrowski (1992: 19) the most widely used formula for return on investment is return on net assets (RONA). According to Ross *et al* (1996: 61)

RONA is a measure of profit per rand of assets invested in a firm and thus an indicator of operating performance. They chose to define it as follows:

RONA = Net profit before interest and tax / Net assets

Helfert (1991: 100) accepts the argument that income taxes are a normal part of doing business and states that net profit before interest but after taxes can be used in the above ratio. Ross *et al* (1996: 61) states that the above ratio is sometimes used with net profit after interest and tax in the numerator.

4.4.3 Return on equity (ROE)

ROE = Net profit after tax / Total equity

According to Ross *et al* (1996: 61) ROE is a measure of how the shareholders fared during the year. Since benefiting shareholders is the main goal of a company, they are of the opinion that ROE is, in an accounting sense, the true bottom-line measure of performance. ROE is a measure of profit per rand invested in equity.

Helfert (1991: 102) prefers to call this ratio “return on net worth” and states that it is the most common ratio used for measuring the return on the owners’ investment.

4.4.4 Du Pont identity

ROE = (Net profit after tax / Sales) * (Sales / Net assets) * (Net assets / Total equity)

The above equation is the traditional Du Pont identity. It shows that ROE depends on operating efficiency (profit margin), asset use efficiency and financial leverage. (Ross et al 1996: 64.)

The Du Pont system is a financial analysis and planning tool, which uses basic accounting relationships, and is designed to provide an understanding of the factors that drive the ROE of a company. ROE can be progressively decomposed to specific income statement and balance sheet items. The decomposition of ROE may be represented by a flow chart. Management can use such a flowchart to identify specific ratios where improvement can best be achieved if ROE is unsatisfactory. (Ross et al 1996: 63 – 64.)

According to Banker *et al* (1993: 25) the Du Pont formula has long been used to measure the financial performance of companies. They are of the opinion that due to the way in which the profitability ratio is constructed, it provides only a gross aggregate measure and does not easily capture the impact that the micro-attributes of the operations of companies have on profitability. In answer to this problem the American Productivity Center's (APC) formula disaggregates changes in a company's profitability into two components capturing changes in its productivity and its price recovery ability.

The APC productivity change ratio is the ratio of the values of current period outputs to base period outputs, divided by the ratio of the values of current period inputs to base period inputs. The APC price recovery ratio is the ratio of the value of outputs at current period prices to the value of base level prices, divided by the ratio of the value of inputs at current period prices to the value at base level prices. (Banker *et al* 1993: 26 – 27.)

When Banker *et al* (1993: 35) combined the profitability component (profit to sales) of the Du Pont formula with the APC method, the resultant ratios allowed more micro-analytic details of performance to be evaluated. They extended the profitability ratio analysis of the APC method and analyzed changes in productivity, price recovery, product mix and capacity utilization to examine how each contributes to changes in a company's profitability.

4.4.5 Earnings per share (EPS)

EPS = Net profit after tax / Number of shares in issue

EPS is a measure to which both management and shareholders pay a great deal of attention. It is widely used in the valuation of common stock and is often the basis for setting specific corporate objectives and goals as part of strategic planning. (Helfert 1991: 105.)

4.4.6 Price/Earnings ratio (P/E ratio)

P/E ratio = Market price per share / EPS

Both management and owners often quote the simple relationship between current or expected EPS and the current market price of the stock. The ratio is also called the “earnings multiple”, and it is used to indicate how the stock market is judging the company’s earnings performance and prospects. (Helfert 1991: 110.)

4.4.7 Excess value (EV)

EV = (Market value of equity + Book value of debt – Total assets) / Sales

EV was first used by Thomadakis (1977) and Errunza & Senbet (1981), and was found significant by Cochran & Wood (1984: 50) to relate social responsibility and financial performance. EV captures the premiums or discounts granted to individual companies by the market. (Allen 1994: 96.)

4.4.8 Return on capital (ROC)

ROC = Net profit after tax / Total capital employed

Stewart (1990: 85) suggested that the rate of return on total capital is the return that should be used to assess corporate performance. According to Stewart ROC measures the productivity of capital employed without regard to the method of financing, it is free from accounting distortions that arise from accrual bookkeeping

entries, free from the conservative bias of accounting statements, and from the tendency to understate capital by writing off unsuccessful efforts. However, Stewart concluded that simply measuring ROC is not enough, as it is important to consider the cost of capital employed as well as the return upon it. He suggested the use of Economic Value Added (discussed in section 4.4.9).

4.4.9 Economic value added (EVA)

Traditional performance measures (net income, ROA, ROE, and earnings per share) do not properly reflect risk and therefore reinforce behaviour that is either too aggressive (that is, aims to maximize earnings) or too conservative (aims to prevent dilution of returns) (Uyemura, Kantor & Pettit 1996: 98).

According to Epstein & Young (1999: 45) shareholder value measures such as economic value added (EVA), an increasingly popular performance metric, can significantly improve corporate decision making in the realm of environmental management and can improve both environmental and general capital investment decisions. (EVA is a registered trademark of Stern Stewart & Company.)

EVA is similar to conventional measures of profit but with two important differences:

- EVA considers the cost of all capital, including the cost of equity.
- EVA corrects for potential distortions caused by generally accepted accounting principles (GAAP).

(Epstein & Young 1999: 46.)

To understand EVA it is necessary to understand market value added (MVA). MVA is the difference between the market value of the company and its invested capital (including equity and debt) contributed to the company:

MVA = Market value – Invested Capital.

(Epstein & Young 1999: 46.)

Following from the above, MVA is the net present value (NPV) of a company's current and anticipated future investments, or the NPV of the company. MVA or NPV can be calculated as the present value of all future EVA, just as it can be the present value of cash flow. (Thompson 1998: 17.)

EVA is the mathematical equivalent of NPV. If the same assumptions are plugged into both valuation models, they will produce the same answer. This is an essential theoretical underpinning of EVA. However, unlike NPV, EVA yields a period-by-period scorecard on whether management is actually delivering positive NPV, and a basis for analysts to assess likely future increases in NPV. (Thompson 1998: 17.)

EVA is a period performance measure of the amount by which net operating profit exceeds or fall short of the cost of all debt and equity capital:

EVA = Net operating profit – Capital charges

or

Net operating profit – Invested capital × Weighted average cost of capital

(Thompson 1998: 17; Epstein & Young 1999: 46.)

Stewart (1990: 192) as well as the Bureau of Financial Analysis of the University of Pretoria calculates EVA as follows:

EVA = (Return on total capital - Weighted average cost of capital) × Capital

If GAAP distorts the measure of capital or operating profit, it can be adjusted as necessary. Most of the adjustments are in the form of "equity equivalents". The logic behind these adjustments is that when companies apply GAAP, certain items are charged to income, such as provisions, deferred taxes, and goodwill, which

artificially (and misleadingly) reduce stated capital. The potential number of adjustments is practically limitless. EVA consultants have already identified more than 150 changes that can be made to operating profit and invested capital. However, most companies make fewer than five adjustments for fear that the evaluation and reward system based on EVA would become impossibly complicated. (Epstein & Young 1999: 46.)

According to Huckle (1995: 41) EVA is the most robust measure of company profitability, but its calculation is onerous and time consuming. Uyemura, Kantor & Pettit (1996: 103) referred to an "EVA drivers" analysis that identifies the specific aspects and parameters of any product or service that are key to realizing a sustainable, positive EVA and conceded that such comprehensive profitability measurement may appear to be a daunting undertaking. However, they are of the opinion that it need not be the case, especially when the following three principles are observed:

- The 80/20 rule is the empirical observation that one can obtain 80% of the information sought by analyzing the most significant 20% of the data.
- EVA is normally applied as a "top-down" process. This means that all analyses begin at the highest level of the organization and is "drilled-down" to lower levels only as warranted by the need and benefit of such additional detail.
- The accountability concept (e.g. line managers should only be accountable for the risk-types they manage) simplifies the EVA analysis of the major line units by limiting the risk dimensions and cost allocation types that should be undertaken.

4.5 SUMMARY AND CONCLUSIONS

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:

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

The above-mentioned measures were all considered in order to determine the most appropriate measures of financial performance for the purposes of this study (refer to section 5.5.2).

CHAPTER 5

RESEARCH DESIGN AND METHODOLOGY

5.1 INTRODUCTION

In this chapter the research design and methodology to investigate the hypothesis stated in chapter 1 concerning the relationship between environmental responsibility and financial performance are presented. The period investigated and the companies selected for the purposes of this study are stated.

The measurement of environmental responsibility is discussed for the purposes of determining appropriate measures to use when establishing whether financial performance is higher for a company where environmental responsibility is higher. Measures of environmental responsibility are selected for the purposes of this study.

The measurement of financial performance is discussed for the purposes of determining appropriate measures to use when establishing whether financial performance is higher for a company where environmental responsibility is higher. Measures of financial performance are selected for the purposes of this study.

The sources of data used in measuring environmental responsibility and in measuring financial performance are stated, as well as the procedures followed to ensure the reliability of the data. Previous research relating to environmental and financial performance measures, as well as to methodology is considered. The methodology followed to determine whether financial performance is higher for a company where environmental responsibility is higher is discussed, including the use of correlation analyses, as well as sector trend analyses.

5.2 PERIOD INVESTIGATED

Internationally environmental reporting in annual financial statements only became really prominent from the beginning of the nineties. In South Africa this development started a few years later. (Van Niekerk 1998: 63.)

For the purposes of this study annual financial statements for the periods ending from 1994 to 1998 were investigated. All year-ends falling in a calendar year were grouped together, for example, the 1998 group consists of financial statements with year-ends from 31 January 1998 up to 31 December 1998.

5.3 SELECTION OF COMPANIES

The criteria for the selection of companies were as follows:

- Only listed companies were included as their published annual financial statements are freely available.
- Only companies listed on the Johannesburg Stock Exchange (JSE) during the calendar years 1994, 1995, 1996, 1997, and 1998 were included, provided they were still listed at the time of selection (29 March 1999).
- The investigation was not limited to certain sectors of the JSE in order to include all possible environmentally responsible companies.

Annual financial statements required for this study were obtained from the Bureau of Financial Analysis (BFA) of the University of Pretoria. The BFA receives annual financial statements of listed companies directly from the JSE as they become available, and follows up on companies of which no annual financial statements were received. A few companies' annual financial statements could not be obtained. Reasons why the annual financial statements were not available included a change in year-end or a very late publication of the annual financial statements.

To ensure that the few outstanding annual financial statements did not jeopardize the relevancy of the study, only annual financial statements that could be obtained

by 20 October 1999 were included.

5.4 MEASURING ENVIRONMENTAL RESPONSIBILITY TO ESTABLISH THE RELATIONSHIP WITH FINANCIAL PERFORMANCE

5.4.1 Previous research

Table 5-1 summarizes the measures of environmental performance (objective or perceptual) used in studies that examined the relationship between environmental performance and financial performance in comparison to the findings (positive, negative or neither) of those studies (refer to section 2.5).

Of the 18 studies listed below, all nine studies that concluded positively about the relationship between environmental performance and financial performance used objective measures of environmental performance, for example indexes prepared by the Council on Economic Priorities (an independent, research-oriented, non-profit organization), U.S. government data and information from the Investor Research Center's Corporate Environment Profile.

Of the seven studies that concluded negatively about the relationship between environmental performance and financial performance four studies used reputational ratings (perceptual measurements), Huckle (1995) used both content analysis (objective measurement) and reputational ratings, Mahapatra (1984) used pollution control expenditures directly as a measure of social responsibility, and Chen & Metcalf (1980) used an objective measurement for environmental performance but came to a negative conclusion due to the impact of firm size (refer to section 2.5).

The two studies that came to neither a positive nor a negative conclusion were that of Wilkinson who used content analysis of annual financial statements and reputational ratings (by black businessmen and women) as a measure of corporate social responsibility, and Bowman & Haire who used an objective measurement.

Measures of environmental performance related to findings of studies

Study	*Objective measure*	*Perceptual measure*	*Positive finding*	*Negative finding*	*Neither*
Bragdon & Marlin (1972)	*		*		
Bowman & Haire (1972)	*				*
Spicer (1978a)	*		*		
Chen & Metcalf (1980)	*			*	
Cochran & Wood (1984)		*		*	
Aupperle, *et al* (1985)		*		*	
Allen (1994)	*		*		
Hart & Ahuja (1994)	*		*		
Huckle (1995)	*	*		*	
Alexander & Buchholz (1978)		*		*	
Spicer (1978b)	*		*		
Shane & Spicer (1983)	*		*		
Stevens (1984)	*		*		
Mahapatra (1984)				*	
Klassen & McLauglin (1995)	*		*		
IRRC (1995)	*		*		
McGuire, *et al* (1988)		*		*	
Wilkinson (1989)	*	*			*

Table 5-1

It seems that using an objective measure contributed to positive findings relating to the relationship between environmental responsibility and financial performance, while perceptual measures seem to contribute to negative findings.

5.4.2 Measures of environmental responsibility selected

Measuring environmental responsibility was discussed in section 3.4. Based on that discussion it is clear that the control list and judgement scale used by Van Niekerk (1998) are objective measures developed from previous empirical research. The control list and the judgement scale used by Van Niekerk (1998) are also used in this study to determine environmentally responsible companies.

The control list and judgement scale is presented respectively in Appendix 1 and 2.

5.4.3 Data used in measuring environmental responsibility

The Department of Accounting and Finance of the University of Pretoria (UP) annually analyses annual financial statements to identify specific environmental reporting. A control list and a judgement scale similar to that of Van Niekerk are used. UP's control list and judgement scale are annually reviewed and adapted for new developments in the field of environmental reporting. UP made their control lists and analyses per company per year (1994 to 1998) available for the purposes of this study. The questions that corresponded to that of the control list of Van Niekerk were extracted from UP's data. Where a question was scored differently than was indicated by the judgement scale used by Van Niekerk, it was changed to reflect the scores used by Van Niekerk.

It was considered important to use the same control list and judgement scale for every year of the study in order to do a meaningful correlation analysis. If the questions of the control list varied every year it would have been extremely difficult to establish the effect of the different questions when doing the analysis.

The data per company obtained from UP were 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.

The environmental reporting percentages per company for every year from 1994 to 1998 are presented in Appendix 3.

The environmental reporting percentages per company were reviewed to identify possible omissions. Where a company did not have an environmental reporting percentage in one or more years but had for the other years, the annual financial statements for the year(s) without environmental reporting percentages were investigated for the level of environmental reporting, using the control list and judgement scale presented in Appendices 1 and 2. No significant adjustments were necessary.

5.5 MEASURING FINANCIAL PERFORMANCE TO ESTABLISH THE RELATIONSHIP WITH ENVIRONMENTAL RESPONSIBILITY

5.5.1 Previous research

Tables 5-2, 5-3 and 5-4 summarize the measures of financial performance as well as control variables used in studies that examined the relationship between environmental performance and financial performance in comparison to the findings (positive, negative or neither) of those studies (refer to section 2.5). "Positive" refers to a finding of a positive correlation between environmental performance and financial performance or another positive conclusion. "Negative" refers to a negative conclusion, e.g. that no relationship exists. "Neither" refers to a finding that is neither positive nor negative, e.g. the finding is inconclusive or contradictory.

Studies that used accounting numbers

Study	*Performance measure*	*Control*	*Finding*
Bragdon & Marlin (1972)	Average ROE and ROC, EPS growth		Positive
Bowman & Haire (1972)	Median ROE		Neither
Spicer (1978a)	ROE, P/E, total risk, beta		Positive
Chen & Metcalf (1980)	ROE, P/E, total risk, beta	Firm size	Negative
Cochran & Wood (1984)	EV, operating earnings to assets, operating earnings to sales		Negative
Aupperle, *et al* (1985)	ROA (one year; five years)	Risk	Negative
Allen (1994)	EV, ROA, ROE, ESR, EAR, SSR, SAR, cash flow	Risk and firm size	Positive
Hart & Ahuja (1994)	ROS, ROA, ROE		Positive
Huckle (1995)	ROAE, ROACE, ROATA	Risk	Negative

Table 5-2

The abbreviations used in table 5-2 are explained below:

EAR = Earnings to asset ratio

EPS = Earnings per share

ESR = Earnings to sales ratio

EV = Excess value (Excess market valuation)

P/E = Price earnings ratio

ROA = Return on assets

ROAE = Return on average equity

ROACE = Return on average capital employed

ROATA = Return on average total assets

ROC = Return on capital

ROE = Return on equity

ROS = Return on sales

SAR = Selling expense to asset ratio

SSR = Selling expense to sales ratio

Studies that used stock market measures

Study	*Performance measure*	*Control*	*Finding*
Alexander & Buchholz (1978)	Return on security	Risk	Negative
Spicer (1978b)	Return on security	Risk	Positive
Shane & Spicer (1983)	Abnormal returns	Risk	Positive
Stevens (1984)	Abnormal returns	Risk	Positive
Mahapatra (1984)	Average market return	Risk	Negative
Klassen & McLauglin (1995)	Abnormal returns	Risk, size, time	Positive
IRRC (1995)	Stock market results	High/low polluters	Positive

Table 5-3

Studies that used accounting numbers and stock market measures

Study	*Performance measure*	*Control*	*Finding*
McGuire, *et al* (1988)	ROA, total assets, sales growth, asset growth, operating income growth, market return (total and risk adjusted)	Risk	Negative
Wilkinson (1989)	ROE, returns to investors	Risk, industry effect	Neither

Table 5-4

The studies that used accounting numbers as performance measures were on average not as successful to prove a positive relationship between environmental responsibility and financial performance (refer to section 2.5) as the studies that used stock market measures.

Almost all the studies that used stock market measures controlled for risk, while most of the studies that used accounting numbers did not. Of the nine studies that controlled for risk five had positive and four negative findings relating to the relationship between environmental responsibility and financial performance.

The studies using stock market measures relating to abnormal returns (combined with positive or negative environmental events) were most successful to prove a positive relationship between environmental responsibility and financial performance.

5.5.2 Measures of financial performance selected

Measuring financial performance was discussed in section 4.4, including various measures often used to measure financial performance. From the previous research (section 5.5.1) it is clear that most researchers in studies that used accounting numbers, preferred to use a number of measures. An advantage of using more than one measure is that the different measures can serve to validate each other. Initially all the measures identified in section 4.4 were considered for selection. 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)

Supportive reasons for selecting these measures are discussed in the following paragraphs.

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. This is not surprising since benefiting shareholders is the main goal of a company, therefore ROE is, in an accounting sense, the true bottom-line measure of performance (refer to section 4.4.3).

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 (Stewart 1990: 153). EVA considers the cost of all capital and corrects for potential distortions caused by generally accepted accounting principles (refer to section 4.4.9).

The following standard ratios used by the BFA for ROE, ROA, and ROC respectively were selected:

ROE = Profit after taxation / Average total owners' interest × 100

ROA = Normal profit before interest and taxation / Average total assets × 100

ROC = Profit after taxation / Average total capital employed × 100

The following general definitions and techniques are used in the calculation of these ratios: According to Zevenbergen (1989: 3) it is desirable to work with the average values of the current and previous years in a number of ratios, especially where balance sheet values are related to income statement items. "Normal profit" is defined as the profit excluding any profit or loss of an extraordinary nature (Zevenbergen 1989: 3). Intangible assets, e.g. goodwill, as well as deferred tax are excluded when calculating these ratios. Where group annual financial statements were presented, the ratios are based on group results.

For the purposes of calculating ROE, equity (or total owners' interest) represents the total interest of the ordinary and preference shareholders in the holding company, plus the outside shareholders' interest in the ordinary and preference shares of the subsidiaries. When calculating ROA, total assets are the sum of total fixed assets, total long-term investments and total current assets. Income from investments is included in normal profit before interest and taxation. When

calculating ROC, total capital employed is total owners' interest plus total long-term loan capital.

The BFA uses the following formula to calculate EVA:

EVA = (Return on total capital - Weighted average cost of capital) × Capital

The EVA values as calculated by the BFA were limited to industrial companies only. The reason for this is that financial, mining and investment companies do not provide the type of financial information required in their annual financial statements.

The EVA module allows the BFA analyst a choice whether to use the inflation adjustments or not. It was decided that the inflation adjustments would lead to more meaningful EVA values for the purposes of this study.

5.5.3 Data used in measuring financial performance

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. Financial performance data per measure and per company are presented in Appendix 4.

The data as presented in Appendix 4 were reviewed to identify and rectify any possible omissions. Where ratios could not be provided the reasons were that –

- the numerator was equal to zero or very small leading to a result that was too large to print;
- the denominator was negative resulting in a meaningless result for the specific ratio; or
- the denominator was equal to zero.

5.6 Methodology to determine what relationship exists between environmental responsibility and financial performance

5.6.1 Previous research

Table 5-5 summarises methodologies of previous studies. From table 5-5 it is clear that previous studies employed statistical tests to find answers to their research questions. Regression and correlation analyses were the methodologies most used in the studies, regardless whether the studies used accounting numbers as financial performance measures or stock market measures. The studies that used stock market measures often made use of financial event methodology in combination with cross sectional regression.

Methodologies of previous studies

Study	*Methodology*
Bragdon & Marlin (1972)	Correlation
Bowman & Haire (1972)	Matched split samples; non-parametric tests
Spicer (1978a)	Cross sectional regression
Chen & Metcalf (1980)	Cross sectional regression
Cochran & Wood (1984)	Regression
Aupperle, *et al* (1985)	Correlation
Allen (1994)	Non-parametric analysis; regression
Hart & Ahuja (1994)	Correlation
Huckle (1995)	Regression and correlation
Alexander & Buchholz (1978)	Rank order correlation
Spicer (1978b)	Market model; cross sectional regression
Shane & Spicer (1983)	Financial event methodology; cross sectional regression
Stevens (1984)	Financial event methodology, with grouping
Mahapatra (1984)	Rank correlations (non-parametric)
Klassen & McLauglin (1995)	Financial event methodology; cross sectional analysis
IRRC (1995)	Correlation
McGuire, *et al* (1988)	Correlation, one test across groups
Wilkinson (1989)	Chi squared test; correlation

Table 5-5

Regression analysis assumes that x is a mathematical variable, measured with negligible error, and that y is a random variable. Many applications of regression analysis involve situations where both x and y are random variables. The correlation model deals with the case where x and y are jointly normally distributed. (Hines & Montgomery 1980: 381; 386.)

For every study it was necessary to decide whether the variables were all independent or which ones assisted in predicting the others. The type of statistical tests depended on the view of the different variables.

5.6.2 Correlation analyses

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. The results may indicate that no relation exists, or that the higher the environmental reporting percentage the higher the financial performance measure, or that the higher the environmental reporting percentage the lower the financial performance measure.

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.

The first correlation analysis was performed for the total qualifying population of companies. To qualify for the correlation analysis 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).

A second correlation analysis was performed for the total population excluding wild points, i.e. companies without environmental reporting percentages during 1997 and 1998 but with some environmental reporting percentages during the period investigated. To qualify for the correlation analysis the same measures as described for the first correlation analysis were required.

A third correlation analysis was performed on the same basis as the first two correlation analyses. Only companies reporting on environmental matters during four to five years of the period of the study (including 1997 and 1998) were included.

Correlation analyses per sector were attempted but due to meaningless results as a consequence of the limited number of observations per sector, other ways had to be found to investigate trends relating to environmental responsibility and financial performance (refer to section 5.6.4).

5.6.3 Causality

Previous research did not establish causality between environmental responsibility and financial performance. The possibility to use the Granger causality test (Eviews 1998:216) for purposes of this study was investigated. Granger causality measures precedence and information content but does not by itself indicate causality in the more common use of the term (EViews 1998: 217). 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. At least twenty environmental reporting percentages per company are required by the

Granger test. At this stage a maximum of five percentages per company are available (one percentage per annum per company for each of the five years tested).

5.6.4 Sector trend analyses

As discussed in section 5.6.2 a correlation analysis per sector was meaningless due to the limited number of observations per sector. However, as an analysis per sector has the potential to contribute meaningful information to the study, the following trend analyses were performed 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 a environmental responsibility measure per sector; and
- data plots per sector.

5.6.4.1 Environmental responsibility per sector

It was necessary to analyse environmental responsibility per sector to identify the environmentally responsible group of companies in the sector, as well as their level of environmental responsibility. This would make the analysis of the financial performance of environmentally responsible companies in a sector versus the group without evidence of environmental responsibility possible.

Environmental responsibility per sector was analysed according to the following criteria:

- The environmental reporting percentages (measure of environmental responsibility – refer to 5.4.2 and 5.4.3) were identified for each company in each sector.
- Companies with wild points in the environmental reporting percentages were excluded (these companies were excluded on the same basis as for the second correlation analysis – refer to section 5.6.2, except that

companies with only 1998 environmental reporting percentages were included if that percentage was 10% or higher).

- An average environmental reporting percentage (ERP) was calculated per company in a sector for the period and the highest and the lowest average ERP per company in a sector were used as an indication to consider the level of environmental responsibility for that sector. (Refer to appendix 5 for the average ERP per company per sector.)
- The number of companies with ERP's in a sector, compared to the total number of companies, as well as the number of companies in a sector that have been reporting on environmental matters for four to five years were used to consider the level of environmental responsibility for that sector.

From the analysis of environmental responsibility per sector the following groups could be identified:

- Five sectors with no environmental responsibility percentages;
- sixteen sectors with little evidence of environmental responsibility;
- nine sectors with reasonable evidence of environmental responsibility; and
- eleven sectors with good evidence of environmental responsibility.

Sectors were selected for the analysis described in section 5.6.4.2 below based on the above groupings as well as the specific criteria described above.

5.6.4.2 Average financial performance for environmentally responsible companies in comparison to average financial performance for companies without an environmental responsibility measure per sector

Average financial performance measures (using the same measures as for the correlation analyses) were calculated for the group of environmentally responsible companies in a sector, as well as for the other group of companies in the sector without environmental reporting percentages. These average financial

performance measures per group were used to analyse the financial performance of the environmentally responsible group (represented by companies with ERP's) in a sector versus the others in the sector.

This analysis was limited to the sectors identified for further analysis from the work done relating to environmental responsibility per sector (refer to 5.6.4.1).

Trends relating to which of the groups performed best per sector were identified where possible as follows:

- For every year and for every financial performance measure (ROC, ROA, ROE and EVA) it was determined whether the group with ERP's or the group without ERP's has the highest average financial measure in a sector.
- It was then considered if a clear trend per sector exists, i.e. whether for all or most of the years and financial measures, either the group with the ERP's or the group without the ERP's has the highest average financial measures, or if no trend exists.

5.6.4.3 Data plots per sector

Although a meaningful correlation analysis per sector was not possible (refer above and to section 5.6.2) it is still possible to use data plots per sector to identify possible trends relating to the relationship between environmental responsibility and financial performance. The trends identified from data plots per sector may be considered rather subjective, but the value thereof lies in the additional evidence that could be obtained. The additional evidence were considered together with the trends identified in section 5.6.4.2 (the average financial performance for the group with ERP's compared to the group without ERP's).

The ERP's are plotted on the x-axis and the financial performance measures (ROC, ROA, ROE or EVA) are plotted on the y-axis. The data plots per sector were done for each financial performance measure separately. The plots included every company in a sector's ERP (as presented in appendix 3) as well as its

financial performance measure (as presented in appendix 4) for 1994, 1995, 1996, 1997 and 1998. Plots were not prepared for sectors with limited data, e.g. less than ten data points over the five-year period.

5.7 SUMMARY AND CONCLUSIONS

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. The control list and the judgement scale used by Van Niekerk (1998) were selected to be used 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. Initially all the measures identified in section 4.4 were considered for selection. 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 a environmental responsibility measure per sector; and
- data plots.

CHAPTER 6

ANALYSIS OF RESULTS

6.1 INTRODUCTION

In this chapter the results of the study are presented and discussed in two sections, i.e. for the correlation analyses and for the sector trend analyses.

The three correlation analyses dealt with are 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.

The following trend analyses are dealt with 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 per sector.

Finally the results are summarised and the conclusion reached on the relationship between environmental responsibility and financial performance is discussed.

6.2 RESULTS OF CORRELATION ANALYSES

The results of the correlation analyses are presented in a tabular format. A table is presented for the correlation between the environmental reporting percentage (ERP) and each financial performance measure for every year from 1994 to 1998, showing the following:

- Correlation coefficient (r)
- Sample size (n)
- P-value (p)

The correlation coefficient (r) is interpreted as follows:

- When r equals 0 there is no correlation.
- The closer r is to +1, the better the positive correlation.
- The closer r is to -1, the better the negative correlation.

For the purposes of this study a positive correlation means that the higher the environmental reporting percentage of a company is, the higher is the financial performance measure. A negative correlation means that the higher the environmental reporting percentage of the company is, the lower is the financial performance measure.

The sample size (n) shows the number of observations; i.e. companies with the particular financial performance measure as well as an environmental reporting percentage.

The p-value gives an indication of how significant the correlation is. It measures the probability of identifying a correlation coefficient if the sample is from a population where there is no correlation. A p-value of 0,05 means that there is a five-percent probability that the correlation is not significant. Likewise a p-value of 0,10 indicates a ten-percent probability that the correlation is not significant. The p-value is strongly influenced by sample size. A larger sample size contributes

more to identifying significant correlation coefficients, should they exist, than a smaller sample size. In the correlation analyses that follow, a p-value of 10% or less is accepted as indicating a significant correlation between ERP and the relevant financial performance measure.

6.2.1 Total qualifying population

Correlation between ERP and ROE

Year	*n*	*r*	*p*
1994	42	0.20	0.175
1995	63	0.24	0.060
1996	61	0.28	0.029
1997	107	0.23	0.018
1998	162	0.02	0.836

Table 6-1

The correlation analysis for 1994 resulted in a small positive correlation coefficient of 0.20 between ERP and ROE. However, the correlation coefficient calculated is not significant as indicated by the p-value of 0.175. The smaller sample size in 1994 compared to the subsequent years could have influenced the p-value, as larger sample sizes contribute to identifying significant correlation coefficients should they exist.

The 1995, 1996 as well as the 1997 correlation analyses resulted in small positive correlation coefficients of 0.24, 0.28 and 0.23 respectively. As is clear from table 6-1, the p-values for each of these correlation coefficients are lower than 10%, which means that these correlation coefficients are significant. The positive correlations for these years indicate that the higher the ERP is for a company, the higher is the ROE for that company.

The correlation coefficient for 1998 is close to nil, but it is not significant as indicated by the high p-value of 0.836. ROE could not be provided by the BFA for

some of the companies for 1998 due to the reasons given in paragraph 5.5.3. The lack of correlation in 1998 could have been influenced by the exclusion of companies for which ROE ratios were not available, that usually have a positive correlation between ERP and a financial performance measure. (The sample size for the correlation analysis between ERP and ROE is 162, while the sample sizes for the correlation analyses between ERP and ROA and between ERP and ROC is 168 and 167 respectively. The correlation analyses between ERP and ROA and between ERP and ROC resulted in small positive correlation coefficients – refer to table 6-2 and table 6-3.)

Correlation between ERP and ROA

Year	*n*	*r*	*p*
1994	47	0.21	0.163
1995	63	0.29	0.020
1996	61	0.28	0.033
1997	109	0.20	0.036
1998	168	0.20	0.009

Table 6-2

The correlation analysis for 1994 resulted in a small positive correlation coefficient of 0.21 between ERP and ROA. However, the correlation coefficient calculated is not significant as indicated by the p-value of 0.163. The smaller sample size in 1994 compared to the subsequent years could have influenced the p-value, as larger sample sizes contribute to identifying significant correlation coefficients should they exist.

The 1995, 1996, 1997 as well as the 1998 correlation analyses resulted in small positive correlation coefficients of 0.29, 0.28, 0.20 and 0.20 respectively. As is clear from table 6-2 the p-values for 1995 to 1998 are all lower than 5%, which means that the correlation coefficients are significant. The positive correlations for these years indicate that the higher the ERP is for a company, the higher is the ROA for that company.

Correlation between ERP and ROC

Year	*n*	*r*	*p*
1994	47	0.22	0.136
1995	63	0.25	0.050
1996	61	0.28	0.028
1997	108	0.18	0.062
1998	167	0.17	0.024

Table 6-3

The correlation analysis for 1994 resulted in a small positive correlation of 0.22 between ERP and ROC. However, the correlation coefficient calculated is not significant as indicated by the p-value of 0.136. The smaller sample size in 1994 compared to the subsequent years could have influenced the p-value, as larger sample sizes contribute to identifying significant correlation coefficients should they exist.

The 1995, 1996, 1997 as well as the 1998 correlation analyses resulted in small positive correlation coefficients of 0.25, 0.28, 0.18 and 0.17 respectively. As is clear from table 6-3, the p-values for each of these correlation coefficients are lower than 10%, which means that these correlation coefficients are significant. The positive correlations for these years indicate that the higher the ERP is for a company, the higher is the ROC for that company.

Correlation between ERP and EVA

Year	*n*	*r*	*p*
1994	32	-0.43	0.014
1995	44	-0.48	0.001
1996	45	-0.36	0.015
1997	72	-0.34	0.003
1998	116	-0.13	0.170

Table 6-4

The correlation analyses between ERP and EVA for 1994, 1995, 1996 and 1997 resulted in negative correlation coefficients of -0.43, -0.48, -0.36 and -0.34 respectively. The relatively strong negative correlation during 1994 and 1995 has weakened in the 1996 and 1997 years. As is clear from table 6-4 the p-values for 1994 to 1997 are all lower than 2%, which means that the correlation coefficients are significant. The negative correlations for these years indicate that the higher the ERP is for a company, the lower is the EVA for that company.

The correlation analysis for 1998 resulted in a very weak negative correlation coefficient of -0.13. However, this correlation coefficient is not significant as indicated by the p-value of 0.17

6.2.2 Total population excluding wild points

Correlation between ERP and ROE

Year	*n*	*r*	*P*
1994	32	0.19	0.298
1995	46	0.24	0.103
1996	53	0.27	0.050
1997	98	0.24	0.019
1998	100	0.05	0.624

Table 6-5

The correlation analysis for 1994 resulted in a small positive correlation coefficient of 0.19 between ERP and ROE. However, the correlation coefficient calculated is not significant as indicated by the p-value of 0.298. The smaller sample size in 1994 compared to the subsequent years could have influenced the p-value, as larger sample sizes contribute to identifying significant correlation coefficients should they exist.

The 1995, 1996 as well as the 1997 correlation analyses resulted in small positive correlation coefficients of 0.24, 0.27 and 0.24 respectively. As is clear from table

6-5, the p-values for each of these correlation coefficients are 10% or lower, which means that these correlation coefficients are significant. The positive correlations for these years indicate that the higher the ERP is for a company, the higher is the ROE for that company. The correlation coefficient for 1998 is close to nil, but it is not significant as indicated by the high p-value of 0.624.

Correlation between ERP and ROA

Year	*n*	*r*	*p*
1994	32	0.18	0.313
1995	46	0.30	0.045
1996	53	0.26	0.063
1997	100	0.21	0.037
1998	103	0.34	0.001

Table 6-6

The correlation analysis for 1994 resulted in a small positive correlation coefficient of 0.18 between ERP and ROA. However, the correlation coefficient calculated is not significant as indicated by the p-value of 0.313. The smaller sample size in 1994 compared to the subsequent years could have influenced the p-value, as larger sample sizes contribute to identifying significant correlation coefficients should they exist.

The 1995, 1996, 1997 as well as the 1998 correlation analyses resulted in small positive correlation coefficients of 0.30, 0.26, 0.21 and 0.34 respectively. As is clear from table 6-6 the p-values for 1995 to 1998 are all lower than 10%, which means that the correlation coefficients are significant. The positive correlations for these years indicate that the higher the ERP is for a company, the higher is the ROA for that company.

Correlation between ERP and ROC

Year	*n*	*r*	*p*
1994	32	0.19	0.292
1995	46	0.26	0.077
1996	53	0.27	0.054
1997	99	0.18	0.071
1998	103	0.21	0.037

Table 6-7

The 1994 correlation analysis resulted in a small positive correlation coefficient of 0.19 between ERP and ROC. However, the correlation coefficient calculated is not significant as indicated by the p-value of 0.292. The smaller sample size in 1994 compared to the subsequent years could have influenced the p-value, as larger sample sizes contribute to identifying significant correlation coefficients should they exist.

The 1995, 1996, 1997 as well as the 1998 correlation analyses resulted in small positive correlation coefficients of 0.26, 0.27, 0.18 and 0.21 respectively. As is clear from table 6-7 the p-values for 1995 to 1998 are all lower than 10%, which means that the correlation coefficients are significant. The positive correlations for these years indicate that the higher the ERP is for a company, the higher is the ROC for that company.

Correlation between ERP and EVA

Year	*n*	*r*	*p*
1994	22	-0.46	0.031
1995	31	-0.48	0.007
1996	37	-0.37	0.019
1997	68	-0.36	0.002
1998	71	-0.08	0.482

Table 6-8

The correlation analyses between ERP and EVA percentage for 1994, 1995, 1996 and 1997 resulted in negative correlation coefficients of -0.46, -0.48, -0.37 and -0.36 respectively. The relatively strong negative correlation during 1994 and 1995 has weakened in the 1996 and 1997 years. As is clear from table 6-8 the p-values for 1994 to 1997 are all lower than 5%, which mean that the correlation coefficients are significant. The negative correlations for these years indicate that the higher the ERP is for a company, the lower is the EVA for that company.

The correlation analysis for 1998 resulted in a very weak negative correlation coefficient of -0.08. However, this correlation coefficient bears is not significant as indicated by the p-value of 0.482.

6.2.3 Companies reporting on environmental matters for four to five years

Correlation between ERP and ROE

Year	*n*	*r*	*p*
1994	30	0.19	0.325
1995	40	0.24	0.132
1996	42	0.28	0.075
1997	44	0.25	0.103
1998	41	0.25	0.122

Table 6-9

The correlation analysis for 1994 resulted in a small positive correlation coefficient of 0.19 between ERP and ROE. However, the correlation coefficient calculated is not significant as indicated by the p-value of 0.325. The smaller sample size in 1994 compared to the subsequent years could have influenced the p-value, as larger sample sizes contribute to identifying significant correlation coefficients should they exist.

The 1995, 1996 as well as the 1997 correlation analyses resulted in small positive correlation coefficients of 0.24, 0.28 and 0.25 respectively. The p-value of 0.132

for 1995 indicates that the correlation is not significant. As is clear from table 6-9, the p-values for 1996 and 1997 are 10% or lower, which means that the correlation coefficients are significant. The positive correlations for these years indicate that the higher the ERP is for a company, the higher is the ROE for that company.

The correlation analyses for 1998 for the total population (refer to 6.2.1) and for the total population excluding wild points (refer to 6.2.2) resulted in correlation coefficients close to nil with respective p-values of 0.836 and 0.624. The correlation coefficient for 1998 for companies reporting on environmental matters for four to five years is also not significant as indicated by the p-value of 0.122. However, it is interesting to note that with the much lower p-value, the result was a small positive correlation coefficient of 0.25. This result is in the same range than that of the other years.

Correlation between ERP and ROA

Year	*n*	*r*	*p*
1994	30	0.19	0.302
1995	40	0.29	0.067
1996	42	0.27	0.087
1997	44	0.20	0.199
1998	44	0.44	0.003

Table 6-10

The correlation analysis for 1994 resulted in a small positive correlation coefficient of 0.19 between ERP and ROA. However, the correlation coefficient calculated is not significant as indicated by the p-value of 0.302. The smaller sample size in 1994 compared to the subsequent years could have influenced the p-value, as larger sample sizes contribute to identifying significant correlation coefficients should they exist.

The 1995, 1996, 1997 as well as the 1998 correlation analyses resulted in small positive correlation coefficients of 0.29, 0.27, 0.20 and 0.44 respectively. As is clear from table 6-10, the p-values for the 1995, 1996 and 1998 correlation coefficients are all lower than 10%, which means that these correlations are significant. The positive correlations for these years indicate that the higher the ERP is for a company, the higher is the ROA for that company. The p-value for 1997 is 0.199, which indicates that the 1997 correlation coefficient is not significant.

Correlation between ERP and ROC

Year	*n*	*r*	*p*
1994	30	0.19	0.311
1995	40	0.27	0.096
1996	42	0.28	0.075
1997	44	0.20	0.185
1998	44	0.36	0.017

Table 6-11

The correlation analysis for 1994 resulted in a small positive correlation coefficient of 0.19 between ERP and ROC. However, the correlation coefficient calculated is not significant as indicated by the p-value of 0.311. The smaller sample size in 1994 compared to the subsequent years could have influenced the p-value, as larger sample sizes contribute to identifying significant correlation coefficients should they exist.

The 1995, 1996, 1997 as well as the 1998 correlation analyses resulted in small positive correlation coefficients of 0.27, 0.28, 0.20 and 0.36 respectively. As is clear from table 6-11, the p-values for 1995, 1996, and 1998 are lower than 10%, which means that the correlation coefficients are significant. The positive correlations for these years indicate that the higher the ERP is for a company, the higher is the ROC for that company. The p-value for 1997 is 0.185, which indicates that the 1997 correlation is not significant.

Correlation between ERP and EVA

Year	*n*	*r*	*p*
1994	21	-0.52	0.017
1995	27	-0.45	0.019
1996	30	-0.37	0.042
1997	31	-0.35	0.051
1998	31	-0.04	0.819

Table 6-12

The correlation analyses between ERP and EVA for 1994, 1995, 1996 and 1997 resulted in negative correlation coefficients of -0.52, -0.45, -0.37 and -0.35 respectively. The relatively strong negative correlation during 1994 and 1995 has weakened in the 1996 and 1997 years. As is clear from table 6-12 the p-values for 1994 to 1997 are 5% or lower, which mean that the correlation coefficients are significant. The negative correlations for these years indicate that the higher the ERP is for a company, the lower is the EVA for that company.

The correlation analysis for 1998 resulted in a very weak negative correlation coefficient of -0.04. However, this correlation coefficient is not significant as indicated by the p-value of 0.819.

6.2.4 Summary and comparison of correlation analyses

6.2.4.1 Correlation between ERP and ROE

Table 6-13 summarises the results of the correlation analyses performed between ERP and ROE for the three groups of companies:

Comparing ERP and ROE for three groups

	Total population		*Excluding wild points*		*4 – 5 years green*	
Year	*r acceptable*	*r*	*r acceptable*	*r*	*r acceptable*	*r*
1998	No	0.02	No	0.05	No	0.25
1997	Yes	0.23	Yes	0.24	Yes	0.25
1996	Yes	0.28	Yes	0.27	Yes	0.28
1995	Yes	0.24	Yes	0.24	No	0.24
1994	No	0.20	No	0.19	No	0.19

Table 6-13

When comparing the correlation coefficients obtained between ERP and ROE for the total population for each of the years under review and that obtained for the total population excluding wild points (refer to table 6-13), the results are almost similar. The correlation analyses for both sets of data resulted in small positive correlation coefficients (with a range of 0.23 to 0.28) every year from 1995 to 1997. These correlation coefficients are significant, as is evident from the low p-values (10% or less) and they indicate that the higher the ERP is for a company, the higher is the ROE for that company.

The correlation analyses for 1994 for the total population and for the total population excluding wild points resulted in small positive correlation coefficients of 0.20 and 0.19 respectively, but the p-values indicate that these correlation coefficients are not significant. . The smaller sample size in 1994 compared to the subsequent years could have influenced the p-value, as larger sample sizes contribute to identifying significant correlation coefficients should they exist. The p-values for the total population were better than that of the total population excluding wild points, probably due to the larger sample sizes.

The correlation analyses for 1998 for the total population and for the total population excluding wild points resulted in correlation coefficients close to nil. The respective p-values of 0.83 and 0.62 indicated that the correlation coefficients

are not significant. ROE could not be provided by the BFA for some of the companies for 1998 due to the reasons given in paragraph 5.5.3. The lack of correlation in 1998 could have been influenced by the exclusion of companies for which ROE ratios were not available, that usually have a positive correlation between ERP and a financial performance measure.

The correlation analyses between ROE and the environmental reporting percentage for companies reporting on environmental matters for four to five years, yielded similar results; i.e. a small positive correlation every year from 1994 to 1998 with a range of 0.19 to 0.28. The consequence of working with a smaller sample size resulted in higher p-values. Only the correlation coefficients for 1996 and 1997 have p-values of 10% or less, which indicate that the correlation coefficients are significant. This means that the higher the ERP is for a company, the higher is the ROE for that company.

6.2.4.2 Correlation between ERP and ROA

Table 6-14 summarises the results of the correlation analyses performed between ERP and ROA for the three groups of companies:

Comparing ERP and ROA for three groups

	Total population		*Excluding wild points*		*4 – 5 years green*	
Year	*r acceptable*	*r*	*r acceptable*	*r*	*r acceptable*	*r*
1998	Yes	0.20	Yes	0.34	Yes	0.44
1997	Yes	0.20	Yes	0.21	No	0.20
1996	Yes	0.28	Yes	0.26	Yes	0.27
1995	Yes	0.29	Yes	0.30	Yes	0.29
1994	No	0.21	No	0.18	No	0.19

Table 6-14

When comparing the results of the correlation analyses performed between ERP and ROA for the three groups of companies for 1995, 1996 and 1997 it is clear

that a small positive correlation (with a range of 0.20 to 0.30) exists (refer to table 6-14). These correlation coefficients are significant as indicated by the p-values of 10% or less, except for the correlation coefficient of the four to five year green group in 1997. This correlation coefficient has a p-value of 0.199. The meaning of the significant correlation coefficients are that the higher the ERP of a company is, the higher is the ROA of that company.

Although the 1994 correlation coefficients are close to the range mentioned above, their p-values indicate that they are not significant. This is probably due to the smaller sample size in 1994 as discussed under 6.2.4.1 above.

The 1998 correlation coefficient for the total population excluding wild points was much higher than that of the total population (0.34 compared to 0.20). The correlation coefficient for the four to five year green group was even higher at 0.44. For 1998 all the correlation coefficients are significant, as is evident from the low p-values (1% and less). This means that the higher the ERP of a company is, the higher is the ROA of that company.

The reason for the improvement in the correlation coefficient where smaller groups that are more environmentally responsible are analysed can be found in the much bigger sample sizes (n) in 1998 than in the previous years. In 1998 n was 168 for the total population, 103 for the total population excluding wild points, and 44 for the four to five year green group. In 1997 n was only 109 for the total population, 100 for the total population excluding wild points, and 44 for the four to five year green group.

6.2.4.3 Correlation between ERP and ROC

Table 6-15 summarises the results of the correlation analyses performed between ERP and ROC for the three groups of companies:

Comparing ERP and ROC for three groups

	Total population		*Excluding wild points*		*4 – 5 years green*	
Year	*r acceptable*	*r*	*r acceptable*	*r*	*r acceptable*	*r*
1998	Yes	0.17	Yes	0.21	Yes	0.36
1997	Yes	0.18	Yes	0.18	No	0.20
1996	Yes	0.28	Yes	0.27	Yes	0.28
1995	Yes	0.25	Yes	0.26	Yes	0.27
1994	No	0.22	No	0.19	No	0.19

Table 6-15

When comparing the results of the correlation analyses performed between ERP and ROC for the three groups of companies for 1995, 1996 and 1997 it is clear that a small positive correlation (with a range of 0.18 to 0.28) exists. These correlation coefficients are all significant as indicated by p-values of 10% or less, except for the correlation of the four to five year green group in 1997. This correlation has a p-value of 0.185. The meaning of the significant correlation coefficients are that the higher the ERP of a company is, the higher is the ROC of that company.

Although the 1994 correlation coefficients falls in the range mentioned above, their p-values indicate that they are not significant. This is probably due to the smaller sample size in 1994 as discussed under 6.2.4.1 above.

The 1998 correlation coefficient for the total population excluding wild points was higher than that of the total population (0.21 compared to 0.17). The correlation coefficient for the four to five year green group was even higher at 0.36. All the 1998 correlation coefficients are significant as is evident from the low p-values (less than 4%). The significant correlation coefficients mean that the higher the ERP of a company is, the higher is the ROC of that company.

The reason for the improvement in the correlation coefficient where smaller groups that are more environmentally responsible are used can be found in the much bigger sample sizes (n) in 1998 than in the previous years. The reduction in sample sizes for ROC was similar to that for ROA as described under 6.2.4.2 above.

6.2.4.4 Correlation between ERP and EVA

Table 6-16 summarises the results of the correlation analyses performed between ERP and EVA for the three groups of companies:

Comparing ERP and EVA for three groups

	Total population		*Excluding wild points*		*4 – 5 years green*	
Year	*r acceptable*	*r*	*r acceptable*	*r*	*r acceptable*	*r*
1998	No	-0.13	No	-0.08	No	-0.04
1997	Yes	-0.34	Yes	-0.36	Yes	-0.35
1996	Yes	-0.36	Yes	-0.37	Yes	-0.37
1995	Yes	-0.48	Yes	-0.48	Yes	-0.45
1994	Yes	-0.43	Yes	-0.46	Yes	-0.52

Table 6-16

When the three groups are compared the results per annum are very similar. There is a relatively strong negative correlation in 1994 and in 1995 (highest correlation coefficient -0.52). The negative correlation weakens from -0.48 in 1995 to -0.37 in 1996 and to -0.36 in 1997 (if the highest correlation coefficient is compared). A negative correlation means that the higher the ERP is for a company, the lower is the EVA for that company.

The correlation coefficients for 1998 are very close to nil, but the p-values for these coefficients indicate that they are not significant. As the other years have significant negative correlation coefficients with low p-values, the 1998 results were reconsidered with the assistance of the Department of Statistics. The

increase in the sample size in 1998 (n = 116 in 1998, n = 72 in 1997), due to more companies with environmental reporting percentages in 1998, brought about that the distribution of the data in 1998 is much closer together than in the other years. This supports the results of the correlation analyses for 1998; i.e. if the distribution of the data is considered there does not seem to be a correlation between EVA and the environmental reporting percentages. This is illustrated in figures 6.1 to 6.5 below:

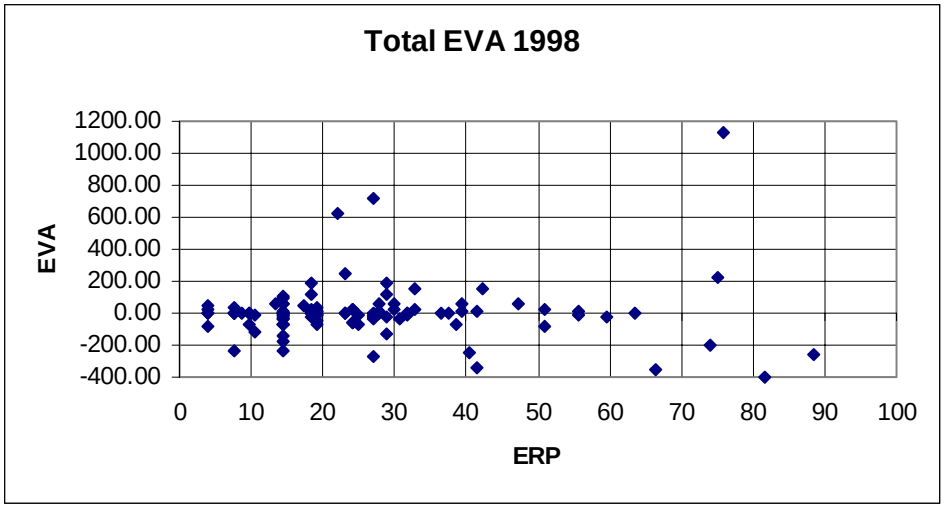


Figure 6.1

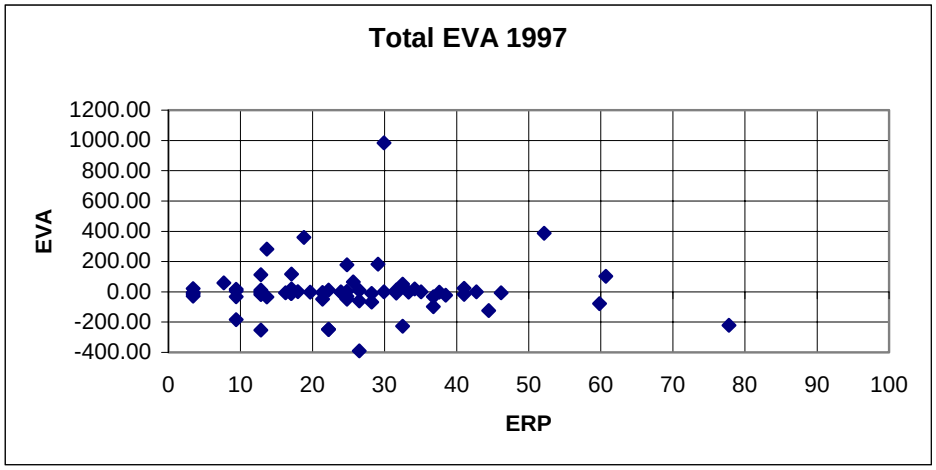


Figure 6.2

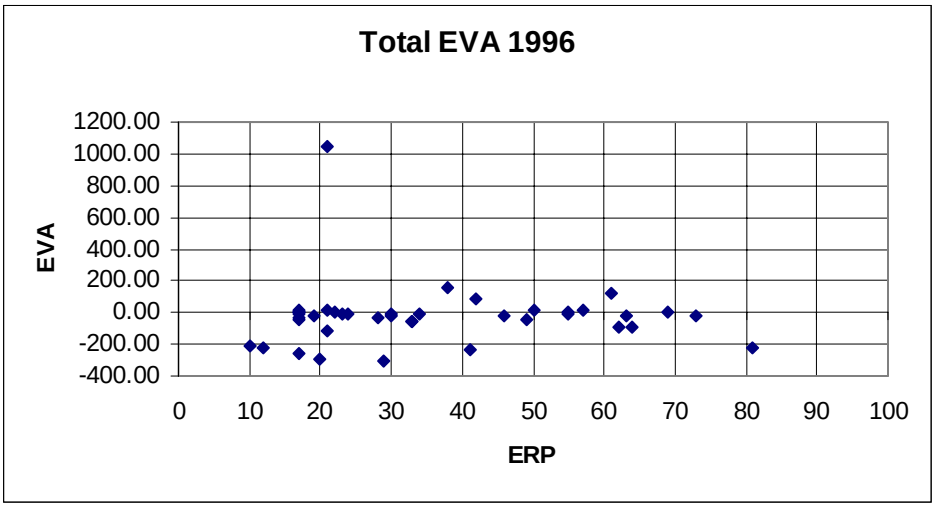


Figure 6.3

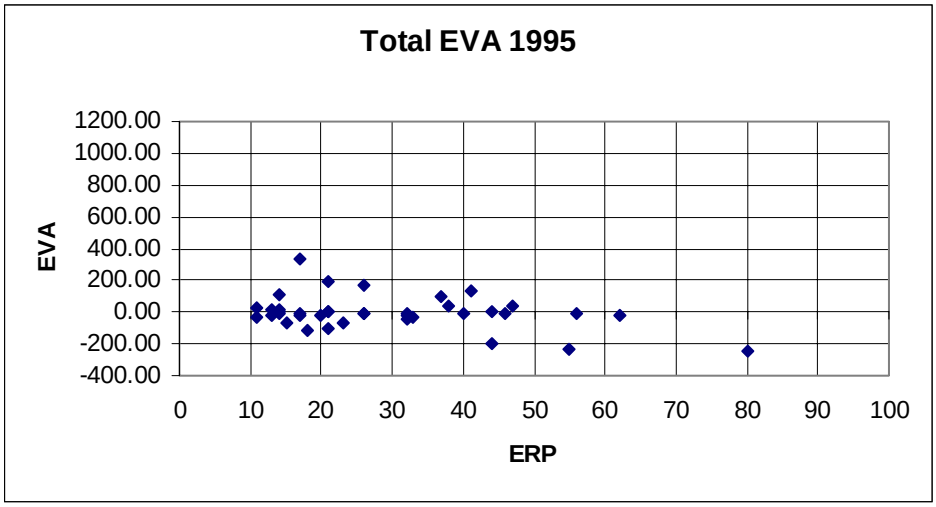


Figure 6.4

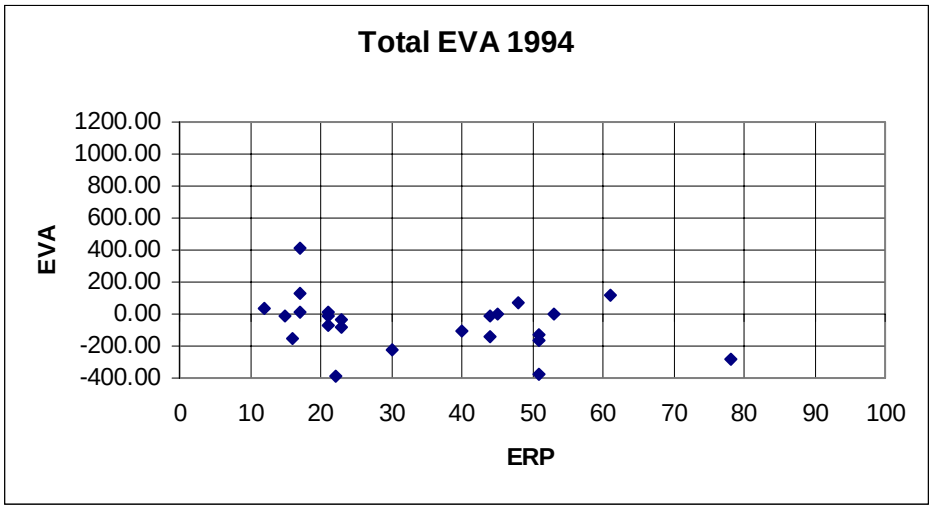


Figure 6.5

6.2.5 Discussion of results of correlation analyses

The correlation analyses for 1994 between ROE, ROA and ROC respectively and the environmental reporting percentage all resulted in small positive correlation coefficients. The range of these correlation coefficients is 0.18 to 0.22 and is very close to the range for 1995, 1996 and 1997. The smaller sample size in 1994 compared to the subsequent years could have influenced the p-value, as larger sample sizes contribute to identifying significant correlation coefficients should they exist. However, the p-values indicate that the correlation coefficients are not significant. Therefore the correlation analyses for 1994 do not contribute any evidence that a relationship exists between ERP and ROE, ROA and ROC respectively.

The correlation analyses for 1995, 1996 and 1997 between ROE, ROA and ROC respectively and the environmental reporting percentage all resulted in small positive correlation coefficients for the total population and the total population excluding wild points. The ranges of these correlation coefficients are as follows:

- 1995 – 0.24 to 0.30
- 1996 – 0.26 to 0.28
- 1997 – 0.18 to 0.25.

These correlation coefficients are significant as indicated by the p-values of 10% and less. This means that there is evidence for 1995 to 1997 that the higher the ERP of a company is, the higher is the financial performance measure (ROE, ROA and ROC) of that company.

The correlation analyses for 1995, 1996 and 1997 between ERP and ROE, ROA and ROC respectively for the four to five year green group also resulted in small positive correlation coefficients, falling into the same ranges as indicated above. However, the p-values exceeded 10% for the correlation analysis between ERP and ROE for 1995, as well as for the correlation analysis between ERP and ROA and between ERP and ROC respectively for 1997. These correlation coefficients

with p-values exceeding 10% are not significant which means that they do not contribute any evidence that a relationship exists between ERP and ROE, ROA and ROC respectively. The four to five year green group has smaller sample sizes than the total population and the total population excluding wild points. The influence thereof could be that significant correlation coefficients are not detected, as larger sample sizes contribute to identifying significant correlations should they exist.

The correlation analyses for 1998 between ERP and ROE for the total population and the total population excluding wild points resulted in correlation coefficients close to nil with high p-values indicating that they are not significant. The correlation analysis for the four to five year green group resulted in a small positive correlation coefficient with a p-value of 12%. Although this p-value is much lower it still exceeds 10% which means the correlation coefficient is not significant. Therefore the correlation analyses for 1998 between ERP and ROE do not contribute any evidence that a relationship exists between ERP and ROE.

The correlation analyses for 1998 between ERP and ROA and between ERP and ROC produced evidence of the benefit of working with smaller groups that are more environmentally responsible or “green”:

- The correlation analysis between ERP and ROA for the total population resulted in a small positive correlation coefficient of 0.20. The correlation analysis for the total population excluding wild points resulted in an improved positive correlation coefficient of 0.34. The correlation analysis for the four to five year green group resulted in an even stronger positive correlation of 0.44. These correlation coefficients are significant as is evident from the low p-values of 1% and less, which means that the higher the ERP of a company is, the higher is the ROA of that company.
- The correlation analysis between ERP and ROC for the total population resulted in a small positive correlation coefficient of 0.17. The correlation analysis for the total population excluding wild points resulted in an improved positive correlation coefficient of 0.21. The correlation analysis

for the four to five year green group resulted in an even stronger positive correlation of 0.36. These correlation coefficients are significant as is evident from the low p-values of 4% and less, which means that the higher the ERP of a company is, the higher is the ROC of that company.

The correlation analyses between ERP and EVA for 1994 to 1997 resulted in small negative correlation coefficients. These coefficients are all significant as is evident from the low p-values, ranging from close to nil to a maximum of five percent. This means that the higher ERP is for a company, the lower is EVA for that company. It is noticeable that smaller sample sizes also contributed to increased p-values as in the other correlation analyses, but due to the very low p-values it did not result in the disregard of these results.

The negative correlation coefficients weakened from 1995 to 1996 and again in 1997. This means that the negative correlation between financial performance and environmental responsibility started to reverse.

The correlation analysis between ERP and EVA for 1998 does not contribute any evidence that a relationship exists between ERP and EVA as the high p-values indicate that the correlation coefficients are not significant. The increase in companies with environmental reporting percentages in 1998 resulted in a much closer distribution of data compared to the previous years. If the distribution of the data is considered there does not seem to be a correlation between EVA and the environmental reporting percentages (refer to 6.2.4 above).

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. 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.

6.2.6 Summary and conclusion for correlation analyses

The results of the correlation analyses between ERP and ROE, ROA and ROC respectively for 1995 to 1997 indicate that a small positive correlation exists between environmental responsibility and financial performance. The correlation coefficients are in a range of 0.18 to 0.30. These correlation coefficients are significant as is evident from the p-values of 10% or less. This means that the higher the ERP is for a company, the higher is the financial performance measure (ROE, ROA and ROC respectively).

The results of the correlation analyses between ERP and ROA and between ERP and ROC for 1998 also indicate that a small positive correlation exists between environmental responsibility and financial performance. Furthermore, these correlation analyses produced evidence of the benefit of working with smaller groups that are more environmentally responsible or "green" as higher positive correlation coefficients resulted for these groups. The highest correlation coefficient of 0.44 was significant as indicated by an extremely low p-value of close to nil. This means that the higher the ERP is for a company, the higher is the ROA and ROC.

The results as discussed above indicate that 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 statement of higher financial performance where environmental responsibility is higher is not very strong.

The correlation analyses between ERP and EVA for 1994 to 1997 resulted in small negative correlation coefficients ranging from -0.52 to -0.34. These coefficients are all significant as is evident from the low p-values, ranging from close to nil to a maximum of five percent. This means that the higher the ERP is for a company the lower is the EVA of that company. The negative correlation coefficients weakened from 1995 to 1996 and again in 1997. The correlation coefficients for 1998 (that are very close to nil) are not significant as is evident from the high p-

values. This means that there is no evidence for 1998 that EVA is higher or lower where ERP is higher or lower. The distribution of the data also indicated that no correlation exists. 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 ROE, ROA and ROC respectively indicate that a small positive correlation exists between environmental responsibility and financial performance (the higher the environmental responsibility, the higher the financial performance). The results of the correlation analyses between ERP and EVA indicate that a small negative correlation exists between environmental responsibility and financial performance (the higher the environmental responsibility, the lower the financial performance). These apparent contradictory findings are explained by the fact that the EVA analyses were only performed for *industrial* companies, whereas the ROE, ROA and ROC analyses included all the companies as indicated in section 5.3. This emphasises the necessity to examine the individual sectors for trends relating to environmental responsibility and financial performance.

These results are in line with previous research results (discussed in section 2.5). 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 & McLauglin (1995) and the IRRC (1995) also found a positive correlation between increased environmental performance and improved financial performance.

6.3 RESULTS OF SECTOR TREND ANALYSES

6.3.1 Environmental responsibility per sector

An average environmental reporting percentage (ERP) per company was calculated as discussed in section 5.6.4.1. (Refer to appendix 5 for the average ERP per company per sector.) The highest and the lowest average ERP, together with the number of companies in the sector, the number of companies with ERP, as well as the number of companies with four to five years of green reporting were used to assess the environmental responsibility per sector.

Table 6-17 summarizes the position relating to environmental responsibility per sector:

Environmental responsibility per sector

Sector no	*Sector description*	*Number of companies*	*Number with ERP*	*Highest average ERP*	*Lowest average ERP*	*Number in 4 – 5 year group*
2	Coal	3	2	76	60	1
6	Diamonds	6	4	56	19	1
14	Gold	15	15	80	34	6
24	Platinum	5	5	82	40	3
28	Metals & minerals	11	8	75	31	2
32	Mining holding & houses	19	14	69	26	5
35	Mining exploration	7	3	29	14	-
39	Private equity funds	7	1	19	19	-
40	Banks	14	2	21	14	-
41	Financial services	19	-			-
42	Life assurance	10	-			-
43	Short-term insurance	6	1	20	20	-

Table 6-17

Sector no	*Sector description*	*Number of companies*	*Number with ERP*	*Highest average ERP*	*Lowest average ERP*	*Number in 4 – 5 year group*
44	Investment trusts	17	1	30	30	-
45	Redevelopment	4	-			-
46	Property	14	2	57	26	1
48	Property unit trusts	11	1	14	14	-
49	Property loan stock	13	3	43	13	-
50	Diversified industrial	15	7	47	12	3
51	Service	9	3	56	13	-
52	Beverages	8	4	36	27	1
53	Hotels & leisure	21	4	22	14	1
54	Building, construction & engineering	29	16	53	14	4
56	Chemicals, oils & plastics	11	6	81	15	4
58	Clothing & textile	16	9	45	14	-
59	Development stage	6	-			-
60	Electronics & electrical	20	6	35	14	-
61	Information technology	25	2	30	21	2
63	Telecommuni-cations	5	2	17	10	-
66	Food	27	17	46	14	5
67	Education & staffing	5	1	24	24	-
68	Furniture & appliances	8	1	41	41	-
69	Media	14	1	11	11	-
71	Packaging & printing	13	6	40	15	2

Table 6-17 (continued)

Sector no	*Sector description*	*Number of companies*	*Number with ERP*	*Highest average ERP*	*Lowest average ERP*	*Number in 4 – 5 year group*
73	Paper	1	1	66	66	1
74	Healthcare	14	3	23	9	1
78	Steel	2	2	74	66	2
80	Retail	60	5	29	12	2
86	Transport	28	10	33	10	3
87	Cash companies	4	-			-
88	Development capital	6	1	28	28	-
89	Venture capital	11	2	26	10	-

Table 6-17 (continued)

6.3.1.1 Sectors with no environmental responsibility percentages

The sectors with no environmental reporting percentages are:

Sector no	*Sector description*
41	Financial services
42	Life assurance
45	Redevelopment
59	Development stage
87	Cash companies

The reason why these sectors have no environmental reporting is probably due to non-existent stakeholder pressure. Sectors 41 and 42 do not have a direct relation to environmental matters and will not be that much affected by stakeholder pressure. The companies in sectors 45 and 59 are relatively new companies that are giving their attention to building their companies and probably do not regard environmental reporting as that important for their immediate goals.

6.3.1.2 Sectors with little evidence of environmental responsibility

The sectors with little evidence of environmental responsibility are:

Sector no	*Sector description*
39	Private equity funds
40	Banks
43	Short-term insurance
44	Investment trusts
48	Property unit trusts
49	Property loan stock
53	Hotels & leisure
61	Information technology
63	Telecommunications
67	Education & staffing
68	Furniture & appliances
69	Media
74	Healthcare
80	Retail
88	Development capital
89	Venture capital

Most of the sectors mentioned above only have one or two companies in the sector with an ERP. The average ERP's are also quite low. Sectors 39, 40 and 43 performed very similar. The highest average ERP's were 19%, 21% and 20% respectively. Only 14,3% to 16,7% of the companies in these sectors have an average ERP. These sectors do not have an apparent direct relation to environmental matters and are at present not much affected by stakeholder pressure. However, refer to section 2.3.7 on how easily especially banks and insurers can be affected by environmental claims.

Only one company, representing 5,9% of sector 44, has an ERP. Its average ERP is somewhat higher at 30% as those discussed above. The property-related sectors (48 and 49) have very low average ERP's at around 14%. Only one company in sector 49 has a relatively high average ERP of 43%. Sector 48 has one company, representing 9,1% of the sector, with an ERP. Sector 49 has three companies, representing 23,1% of the sector, with ERP's.

The companies in sector 53 with ERP's represent 19% of the sector. The lowest average ERP is 14% and the highest average ERP 22% for these companies. One of these companies has been reporting on environmental matters for four years. That does not justify this sector to be included in the group of sectors with reasonable evidence of environmental responsibility (section 6.3.1.3).

Sector 61 has two companies, representing 8% of the sector, with ERP's. These average ERP's are relatively low at 21% and 30%. The fact that these two companies have been reporting on environmental matters for four to five years does not justify this sector to be included in the group of sectors with reasonable evidence of environmental responsibility (section 6.3.1.3).

The companies in sector 63 with ERP's represent 40% of the sector. This appears high but as there is only five companies in this sector it is not that good. Furthermore the average ERP's are very low at 10% and 17%. Sector 67 has one company with an average ERP of 24%, representing 20% of the sector.

Sector 68 has one company with an average ERP of 41%, but as this company represents only 12,5% of the sector, this sector is included in this group. Sector 69 has one company with an average ERP of 11%, representing 7,1% of the sector.

Sector 74 has 21,4% companies with ERP's. The lowest average ERP is 14% and the highest 23%. The fact that one of these companies has been reporting on environmental matters for five years does not justify this sector to be included in the group of sectors with reasonable evidence of environmental responsibility (section 6.3.1.3).

The companies in sector 80 with ERP's represent 8,3% of the sector. The lowest average ERP is 12% and the highest average ERP 29%. The fact that two of these companies have been reporting on environmental matters for four years does not justify this sector to be included in the group of sectors with reasonable evidence of environmental responsibility (section 6.3.1.3).

The companies with ERP's in sectors 88 and 89 represent 16,7% and 18,2% respectively of their sectors. The highest average ERP was 28% and 26% for sector 88 and 89 respectively.

6.3.1.3 Sectors with reasonable evidence of environmental responsibility

The sectors with reasonable evidence of environmental responsibility are:

Sector no	*Sector description*
35	Mining exploration
46	Property
50	Diversified industrial
51	Service
52	Beverages
58	Clothing & textile
60	Electronics & electrical
71	Packaging & printing
86	Transport

Sector 35 is the only mining related sector in this group. The other mining related sectors are included in the group with good evidence of environmental responsibility (section 6.3.1.4). The companies with ERP's in sector 35 represent 42,9% of the sector. However, the average ERP's are low with the highest average ERP at 29% and the lowest average ERP at 14%.

Sector 46 has only two companies in the sector with ERP's, representing 14,3% of the sector. However, the average ERP's are relatively high at 26% and 57%. One of these companies has been reporting on environmental matters for four years.

The companies in sector 50 with ERP's represent 46,7% of the sector. The lowest average ERP is 12% and the highest average ERP 47%. Three companies have been reporting on environmental matters for four to five years.

Companies representing 33,3% of sector 51 have ERP's. The lowest average ERP is 13% and the highest average ERP 56%. The companies in sector 52 with

average ERP's represent 50% of the sector. The lowest average ERP is 27% and the highest average ERP 36%. One of these companies has been reporting on environmental matters for four years.

The companies in sector 58 with ERP's represent 56% of the sector. The lowest average ERP is 14% and the highest average ERP 45%. Companies representing 30% of sector 60 have average ERP's. The lowest average ERP is 14% and the highest average ERP 35%.

The companies in sector 71 with ERP's represent 46,2% of the sector. The lowest average ERP is 15% and the highest average 40%. Two of these companies have been reporting on environmental matters for four to five years.

Companies representing 35,7% of sector 86 have ERP's. The lowest average ERP is 10% and the highest average ERP 33%. Three of these companies have been reporting on environmental matters for four to five years.

6.3.1.4 Sectors with good evidence of environmental responsibility

The sectors with good evidence of environmental responsibility are:

Sector no	*Sector description*
2	Coal
6	Diamonds
14	Gold
24	Platinum
28	Metals & minerals
32	Mining holding & houses
54	Building, construction & engineering
56	Chemicals, oils & plastics
66	Food
73	Paper
78	Steel

Each of the mining-related sectors (sector 2 to 32) included in this group has a high number of companies with very impressive ERP's. Two of the three

companies in sector 2, representing 66,7%, have average ERP's of 60% and 76% respectively. The company without an average ERP is the holding company of one of the companies that has been reporting on environmental matters for five years.

The companies in sector 6 with ERP's represent 66,7% of the sector. The lowest average ERP is 19% and the highest average ERP 56%. One of these companies has been reporting on environmental matters for five years. The company with the ERP of 19% reported on environmental matters for the first time in 1998. If this company is ignored the next lowest average ERP is 39%.

All of the companies in sector 14 have ERP's. The lowest average ERP is 34% and the highest average ERP 80%. Six of these companies (40%) have been reporting on environmental matters for four to five years.

Sector 24 performed similar to sector 14. All of the companies in sector 24 have ERP's as well. The lowest ERP average is 40% and the highest average ERP 82%. Three of these companies (60%) have been reporting on environmental matters for four to five years.

The companies in sector 28 with ERP's represent 72,7% of the sector. The lowest average ERP is 31% and the highest average ERP 75%. Two of these companies have been reporting on environmental matters for four to five years.

The companies in sector 32 with ERP's represent 73,7% of the sector. The lowest average ERP is 26% and the highest average ERP 69%. Five of these companies have been reporting on environmental matters for four to five years.

Companies representing 55,2% of sector 54 have average ERP's. The lowest average ERP is 14% and the highest average ERP 53%. Four of these companies have been reporting on environmental matters for four to five years.

The companies in sector 56 with ERP's represent 54,5% of the sector. The lowest average ERP is 15% and the highest average ERP 81%. Four of these companies have been reporting on environmental matters for four to five years. If the company with the ERP of 15 is ignored, the next lowest average ERP is 40%.

Companies representing 63% of sector 66 have ERP's. The lowest average ERP is 14% and the highest average ERP 46%. Five of these companies have been reporting on environmental matters for four to five years.

The companies in sector 71 with ERP's represent 46,2% of the sector. The lowest average ERP is 15% and the highest average ERP 40%. Two of these companies have been reporting on environmental matters for four to five years.

Sectors 73 and 78 performed similar to each other as well as to the mining-related sectors in this group. Sector 73 has one company and sector 78 two companies. The company in sector 73 has an average ERP of 66% and has been reporting on environmental matters for five years. The one company in sector 78 has an average ERP of 66% and the other company has 74%. Both companies have been reporting on environmental matters for five years.

6.3.1.5 Sectors selected for further analysis

The sectors selected for further analyses in section 6.3.3 were determined based on the results of the environmental responsibility discussed above in section 6.3.1. The sectors with no ERP's cannot be analysed further as there is not an environmentally responsible group to compare to other groups. Therefore the sectors mentioned in section 6.3.1.1 are excluded from further analyses.

Most of the sectors with little evidence of environmental responsibility (refer to section 6.3.1.2) were not selected for further analyses. These sectors have only one or two companies with ERP's and then the average ERP is very low. Sectors 49, 53, 61, 68, 74 and 80 were selected as they could possibly reveal more evidence if analysed further. These sectors have more companies with ERP's, the

average ERP's are not as low as that of the sectors excluded, and they include companies that have been reporting on environmental matters for four to five years.

All the sectors with reasonable evidence of environmental responsibility (refer to section 6.3.1.3) were selected for further analyses. Most of these sectors have a reasonable number of companies with ERP's. The lowest average ERP's are as low as 10%, while the highest average ERP is 57%.

All the sectors with good evidence of environmental responsibility (refer to section 6.3.1.4) could not be selected for further analyses. Sectors 2, 14, 24, 73 and 78 were not selected, as all the companies in those sectors are environmentally responsible as evidenced by the ERP's. Sectors 6, 28, 32, 54, 56 and 66 were selected for further analyses, as these sectors include many companies with ERP's. The lowest average ERP's are as low as 14%, while the highest average ERP is 81%.

6.3.2 Summary and conclusion for environmental responsibility per sector

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 sectors with little evidence of environmental responsibility have a small number of companies per sector that have ERP's and the lowest and the highest average ERP's are very low at 10% and 43% respectively. Three of the sectors included four companies that have been reporting on environmental matters for

four to five years. However, this fact could not justify those sectors to be transferred to the group with reasonable evidence of environmental responsibility as their average ERP's are very low and the number of companies with ERP's in those sectors is small.

Most of the financial- and the property-related sectors were included in the group with little evidence of environmental responsibility. Two of the financial-related sectors were included in the group without ERP's and one of the property-related sectors was included in the group with reasonable evidence of environmental responsibility. At present these sectors are not much affected by stakeholder pressure, but the situation can change very suddenly as it did especially in the USA where companies in these sectors were adversely affected by environmental claims resulting from contaminated property (refer to section 2.3.7).

Five of the sectors with reasonable evidence of environmental responsibility include ten companies that have been reporting on environmental matters for four to five years. The sectors included in this group have a reasonable number of companies with ERP's. The highest average ERP is 57% and the lowest 10%.

All the companies in four of the sectors with good evidence of environmental responsibility have ERP's. The other sectors have a high number of companies with ERP's (54,5% and higher). The average ERP's are quite high for this group. The highest average ERP is 81%, although the lowest average ERP is as low as 14%. All the sectors in this group include companies that have been reporting on environmental matters for four to five years. These companies amount to 34.

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.

It is striking that the sectors that have good evidence of environmental responsibility are the same sectors that may be regarded as having a direct impact on the environment. These sectors are more likely to be affected by stakeholder pressure from example legislation (refer to section 2.3.2) and the "green consumer" (refer to section 2.3.4).

6.3.3 Average financial performance of environmentally responsible companies in comparison to that of companies without an environmental responsibility measure per sector

The average financial performance measures were calculated for the group of environmentally responsible companies in a sector, as well as for the other group of companies in the sector without environmental reporting percentages as discussed in section 5.6.4.2. (Refer to appendix 5 for the average financial performance measures calculated.)

The sectors selected for further analyses were identified in section 6.3.1.5 above. Table 6-18 shows the sectors analysed, the number of environmentally responsible companies in the sector (represented by companies with ERP's), the number of companies without ERP's and trends identified:

Trends from average financial performance analysis per sector

Sector no	*Sector description*	*Number without ERP*	*Number with ERP*	*Trends identified*
6	Diamonds	2	4	ERP group performed best
28	Metals & minerals	3	8	ERP group performed best
32	Mining holding & houses	5	14	None
35	Mining exploration	4	3	None
46	Property	12	2	ERP group performed best

Table 6-18

Sector no	*Sector description*	*Number without ERP*	*Number with ERP*	*Trends identified*
49	Property loan stock	10	3	None
50	Diversified industrial	8	7	Group without ERP's performed best
51	Service	6	3	Group without ERP's performed best
52	Beverages	4	4	ERP group performed best
53	Hotels & leisure	17	4	Group without ERP's performed best
54	Building, construction & engineering	13	16	None
56	Chemicals, oils & plastics	5	6	ERP group performed best
58	Clothing & textile	7	9	ERP group performed best
60	Electronics & electrical	14	6	None
61	Information technology	23	2	None
66	Food	10	17	ERP group performed best
68	Furniture & appliances	7	1	None
71	Packaging & printing	7	6	None
74	Healthcare	11	3	ERP group performed best
80	Retail	55	5	None
86	Transport	18	10	ERP group performed best

Table 6-18 (continued)

6.3.3.1 Sectors where the group with ERP's performed best

Sector 6

The average ROC and the average ROE are higher every year for the group with ERP's compared to the group without ERP's in sector 6. The average ROA is

higher in 1994, 1995 and in 1996 for the group with ERP's compared to the group without ERP's. In 1997 and in 1998 the average ROA are higher for the group without ERP's. This apparent turnaround in performance is caused by one company included in the group with ERP's that have high negative ROA values every year from 1994 to 1998. The BFA did not provide values for ROE and ROC, but indicated that the values are meaningless as discussed in section 5.5.3.

This company is the only company in the sector with negative values. The negative values are much higher in 1998 than in the prior years. This company has an ERP in 1998 only and the ERP is low at 19% if compared to the ERP's of the other companies. If this company is excluded for the purpose of calculating average ROA, the average ROA is higher every year for the group with ERP's compared to the group without ERP's. Even if this company is not excluded from the calculation, the average ROE, ROA and ROC values still indicate that the group with ERP's performed best compared to the group without ERP's in sector 6.

Sector 28

The average ROC, the average ROA and the average ROE are higher every year for the group with ERP's compared to the group without ERP's in sector 28. One of the companies included in the group without ERP's has extremely poor ROC values if compared to that of the sector. Even if this company is excluded from the calculation, the average ROE, ROA and ROC values still indicate that the group with ERP's performed best compared to the group without ERP's.

Sector 46

The average ROC and the average ROE are higher every year for the group with ERP's compared to the group without ERP's in sector 46. The average ROA is also higher every year, except for 1998. In 1998 the average ROA for the group with ERP's is 2% lower than for the group without ERP's. This can be attributed to

one of the green companies that has an ROA of 5,62% in 1998, but has ROA's of 11,08%, 13,77%, 15,59% and 14,59% in 1994, 1995,1996 and 1997 respectively.

Sector 52

The average ROC and the average ROA are higher every year for the group with ERP's compared to the group without ERP's in sector 52. The average ROE is also higher every year, except for 1998. In 1998 the average ROE for the group with ERP's (18,29%) is almost equal to the average ROE for the group without ERP's (18,59%). The average ROE for the group with ERP's exceeded the average ROE for the group without ERP's from 1994 to 1997 with 5% to 10%. The decrease in average ROE in 1998 can be attributed to one of the green companies that has an ROE of more than 10% less than what it has in 1997 and 1996. The average EVA for the group with ERP's exceeds the average EVA for the group without ERP's every year substantially.

Sector 56

The average ROC, the average ROA and the average ROE are higher every year for the group with ERP's compared to the group without ERP's in sector 56. The average EVA for the group without ERP's are much better than the average EVA for the group with ERP's for 1994,1995, 1996 and 1998. In 1997 the average EVA for the group with ERP's exceeded the average EVA for the group without ERP's. The reason is that one of the green companies has a positive EVA in 1997, but negative values for EVA in 1994,1995, 1996 and 1998.

Sector 58

The average ROC and the average ROE are higher every year for the group with ERP's compared to the group without ERP's in sector 58. The average ROA is higher in 1994, 1995, 1996 and in 1997 for the group with ERP's compared to the group without ERP's. In 1998 the average ROA is 1,22% higher for the group without ERP's compared to the group with ERP's. The average EVA for the group

without ERP's are much better than the average EVA for the group with ERP's for 1994,1996, 1997 and 1998. In 1995 the average EVA for the group with ERP's exceeded the average EVA for the group without ERP's. In this sector the companies in the group with ERP's have higher negative EVA values than the companies in the group without ERP's.

Sector 66

The average ROA and the average EVA are higher every year for the group with ERP's compared to the group without ERP's in sector 66. The average ROC is higher in 1994, 1995, 1996 and in 1997 for the group with ERP's compared to the group without ERP's. In 1998 the average ROC is higher with 1,1% for the group without ERP's compared to the group with ERP's. This can be attributed to one of the companies in the group with the ERP's that has declining ROC values from 1994 to 1998. The negative ROC in 1998 for that company is exceptionally high. The average ROE is higher in 1995 and in 1996 for the group with ERP's compared to the group without ERP's. In 1994, 1997 and in 1998 the average ROE is higher for the group without the ERP's compared to the group with ERP's. This can be attributed to the same company that is mentioned above. The exceptionally high negative values for ROE in 1997 and in 1998 for that company affected the average ROE for the group with ERP's adversely in 1997 and in 1998.

Sector 74

The average ROC is higher every year, except for 1998, for the group with ERP's compared to the group without ERP's in sector 74. The average ROA is higher every year for the group with ERP's compared to the group without ERP's. The average EVA is higher every year, except for 1996 for the group with ERP's compared to the group without ERP's. The average ROE are higher in 1994, 1997 and in 1998 for the group without ERP's compared to the group with ERP's.

Sector 86

The average ROC and the average ROE are higher every year, except for 1998, for the group with ERP's compared to the group without ERP's in sector 86. The average ROA is higher every year for the group with ERP's compared to the group without ERP's. The average EVA is higher in 1995, 1996 and in 1997 for the group with ERP's compared to the group without ERP's. In 1994 and in 1998 the average EVA is higher for the group without ERP's. In 1998 more companies in the group with ERP's performed worse than in the group without ERP's.

6.3.3.2 Sectors where the group without ERP's performed best

Sector 50

The average EVA is higher every year for the group without ERP's compared to the group with ERP's in sector 50. The average ROC and the average ROE are higher in 1994, 1997 and in 1998 for the group without ERP's compared to the group with ERP's. In 1995 and in 1996 the average ROC and the average ROE are higher for the group with ERP's compared to the group without ERP's. This is due to one company in the group without ERP's that has very poor ROC and ROE percentages in those years compared to the other companies in the sector. The average ROA is higher every year, except for 1996, for the group without ERP's compared to the group with ERP's. In 1996 the respective average ROA's for the group without ERP's and the group with ERP's are almost equal.

Sector 51

The average ROC and the average ROE are higher every year, except for 1994, for the group without ERP's compared to the group with ERP's in sector 51. The average ROA is higher every year, except for 1994 and 1996, for the group without ERP's compared to the group with ERP's. The average EVA is higher every year, except for 1998, for the group without ERP's compared to the group with ERP's.

Sector 53

The average ROA, ROE and EVA are higher every year for the group without ERP's compared to the group with ERP's in sector 53. The average ROC is also higher every year for the group without ERP's compared to the group with ERP's, except for 1998 where one of the companies in the group with ERP's improved its performance considerably.

6.3.3.3 Sectors where no clear trends could be identified

For some sectors a comparison between the average ROC, ROA, ROE and EVA for the group without ERP's and for the group with ERP's did not result in the identification of any clear trends. These sectors are indicated with the description "none" in table 6-18 under section 6.3.3.

6.3.4 Data plots of ERP and financial performance measure per sector

The data plots per sector were prepared as discussed in section 5.6.4.3. The purpose of these plots is to provide additional evidence relating to the relationship between environmental responsibility and financial performance. The plots are presented in appendix 6. The following trends were identified from the data plots:

- Positive trend – the higher the ERP, the higher the financial performance measure; i.e. the higher the environmental responsibility, the higher the financial performance and vice versa.
- Negative trend – the lower the ERP, the higher the financial performance measure; i.e. the lower the environmental responsibility, the higher the financial performance and vice versa.
- Zero trend – the financial performance measure neither increases nor decreases as the ERP increases; i.e. environmental responsibility has no relationship to financial performance.
- No trend – the data points are scattered over the data plot without any trend being obvious.

In table 6-19 the sectors for which data plots were prepared are identified, as well as the trends (a positive trend is indicated with “positive”, a negative trend is indicated with “negative”, a zero trend is indicated with “zero”, no trend is indicated with ‘’none” and not applicable (no data plots prepared) with “N/A’’):

Trends from data plots per sector

Sector no	*Sector description*	*ERP/ ROC*	*ERP/ ROA*	*ERP/ ROE*	*ERP/ EVA*
6	Diamonds	None	Positive	None	N/A
24	Platinum	Positive	Positive	Positive	N/A
28	Metals & minerals	None	None	Zero	N/A
32	Mining holding & houses	Zero	Zero	Zero	N/A
50	Diversified industrial	Zero	Zero	Zero	None
52	Beverages	Zero	Zero	Zero	None
53	Hotels & leisure	Positive	None	Positive	None
54	Building, construction & engineering	Zero	Zero	Zero	None
56	Chemicals, oils & plastics	Zero	Zero	Zero	None
58	Clothing & textile	Zero	Zero	Zero	Zero
60	Electronics & electrical	Positive	Zero	Zero	Zero
61	Information technology	Negative	Zero	Negative	Zero
66	Food	Zero	Zero	Zero	None
71	Packaging & printing	Positive	Zero	Zero	Positive
74	Healthcare	Positive	Positive	Positive	Positive
78	Steel	Zero	Zero	Positive	None
80	Retail	Zero	Zero	Zero	Zero
86	Transport	Zero	Zero	Zero	None

Table 6-19

The sectors that indicated mainly a positive, negative, zero or no trend respectively are discussed below.

6.3.4.1 Sectors with data plots that indicate a positive trend

The data plot below serves as an illustration of a data plot that indicates a positive trend; i.e. the better the environmental responsibility, the better the financial performance and vice versa. Refer to appendix 6 for the other data plots discussed in this section.

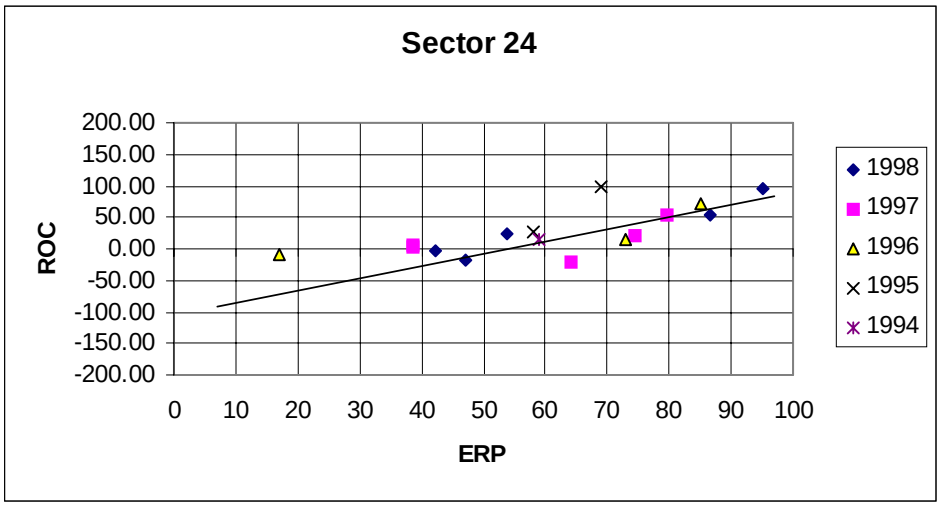


Figure 6.6

Sector 24

The data plots between ERP and ROC, ROA and ROE respectively for sector 24 indicate that there is a positive trend between environmental responsibility (as indicated by ERP) and financial performance (as indicated by ROC, ROA, and ROE). The higher the environmental responsibility the higher is the financial performance. Sector 24 could not be included in the comparison between the average performance of environmentally responsible companies and that of companies without ERP's (section 6.3.3) as all the companies in this sector have ERP's. The fact that this sector falls in the group of sectors with good evidence of environmental responsibility (section 6.3.1.4) and that all the companies in the

sector are environmentally responsible support the positive trend indicated by the data plots.

Sector 53

The data plots between ERP and ROC and between ERP and ROE for sector 53 indicate that there is a positive trend between environmental responsibility (as indicated by ERP) and financial performance (as indicated by ROC and ROE). The higher the environmental responsibility the higher is the financial performance. No trend is obvious from the data plots between ERP and ROA and between ERP and EVA. However, the data plot that indicates a positive trend is not supported by the comparison between the average financial performance of companies with ERP's and those without in this sector. Sector 53 is one of the sectors where the group without ERP's performed best (refer to section 6.3.3.2).

Sector 71

The data plots between ERP and ROC and between ERP and EVA for sector 71 indicate that there is a positive trend between environmental responsibility (as indicated by ERP) and financial performance (as indicated by ROC and EVA). The higher the environmental responsibility the higher is the financial performance. The data plots between ERP and ROA and between ERP and ROE indicate a zero trend; i.e. environmental responsibility has no relationship to the financial performance. From the comparison between the average financial performance of companies with ERP's and those without in this sector, no clear trend could be identified (refer to table 6-18 under section 6.3.3).

Sector 74

The data plots between ERP and ROC, ROA, ROE and EVA respectively for sector 74 indicate that there is a positive trend between environmental responsibility (as indicated by ERP) and financial performance (as indicated by ROC, ROA, ROE and EVA). The higher the environmental responsibility the

higher is the financial performance. From the comparison between the average financial performance of companies with ERP's and those without in this sector, no clear trend could be identified (refer to table 6-18 under section 6.3.3).

6.3.4.2 Sectors with data plots that indicate a negative trend

The data plot below serves as an illustration of a data plot that indicates a negative trend; i.e. the better the environmental responsibility, the worse the financial performance and vice versa. Refer to appendix 6 for the other data plots discussed in this section.

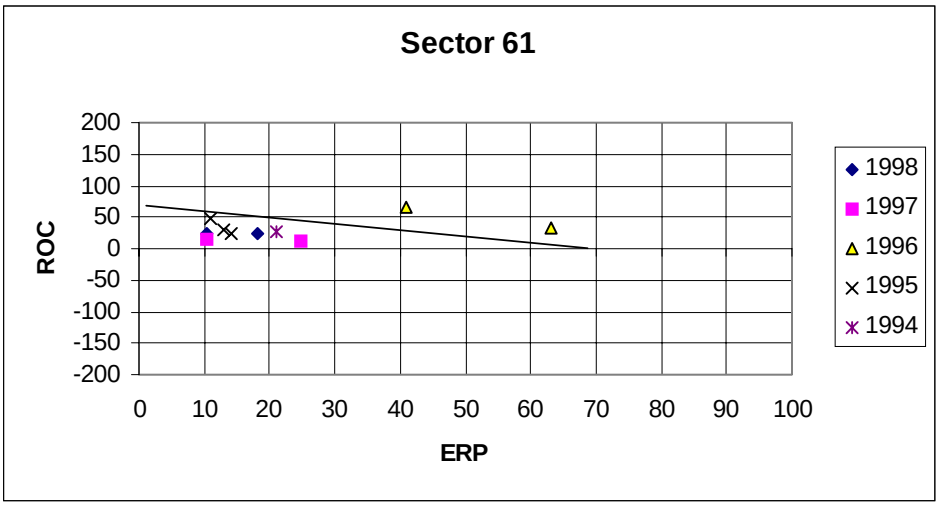


Figure 6.7

Sector 61

The data plots between ERP and ROC and between ERP and ROE for sector 61 indicate that there is a negative trend between environmental responsibility (as indicated by ERP) and financial performance (as indicated by ROC and ROE). The higher the environmental responsibility the lower is the financial performance. The data plots between ERP and ROA and between ERP and EVA indicate that there is a zero trend; i.e. environmental responsibility has no relationship to financial performance. From the comparison between the average financial performance of companies with ERP's and those without in this sector, no clear trend could be identified (refer to table 6-18 under section 6.3.3).

6.3.4.3 Sectors with data plots that indicate a zero trend

The data plot below serves as an illustration of a data plot that indicates a zero trend (the financial performance measure neither increases nor decreases as the ERP increases); i.e. environmental responsibility has no relationship to financial performance. Refer to appendix 6 for the other data plots discussed in this section.

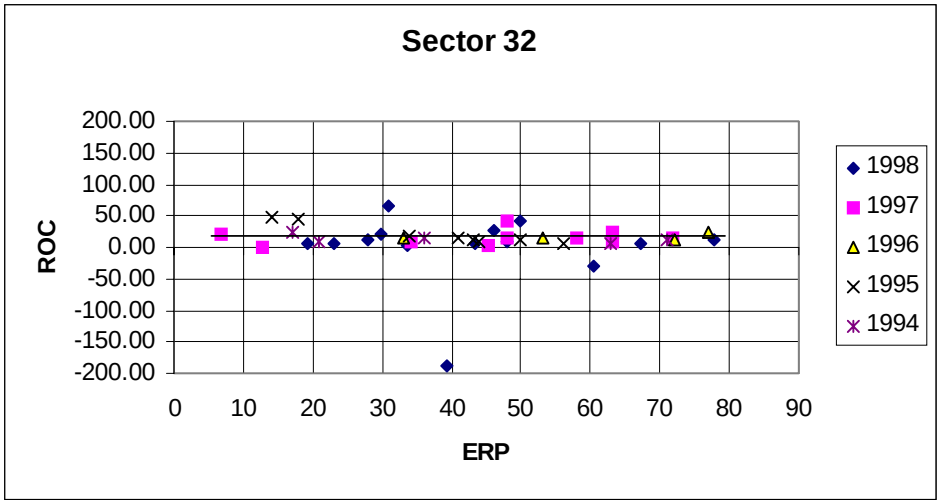


Figure 6.8

Sector 32

The data plots between ERP and ROC, ROA and ROE respectively for sector 32 indicate that there is a zero trend between environmental responsibility (as indicated by ERP) and financial performance (as indicated by ROC, ROA and ROE); i.e. environmental responsibility has no relationship to financial performance. From the comparison between the average financial performance of companies with ERP's and those without in this sector, no clear trend could be identified (refer to table 6-18 under section 6.3.3).

Sector 50

The data plots between ERP and ROC, ROA and ROE respectively for sector 50 indicate that there is a zero trend between environmental responsibility (as

indicated by ERP) and financial performance (as indicated by ROC, ROA and ROE); i.e. environmental responsibility has no relationship to financial performance. The data plot between ERP and EVA indicates that there is no obvious trend between environmental responsibility (as indicated by ERP) and financial performance (as indicated by EVA). The result of the comparison between the average financial performance of companies with ERP's and those without in this sector indicated that the group without ERP's performed best (refer to section 6.3.3.2).

Sector 52

The data plots between ERP and ROC, ROA and ROE respectively for sector 52 indicate that there is a zero trend between environmental responsibility (as indicated by ERP) and financial performance (as indicated by ROC, ROA and ROE); i.e. environmental responsibility has no relationship to financial performance. The data plot between ERP and EVA indicates that there is no obvious trend between environmental responsibility (as indicated by ERP) and financial performance (as indicated by EVA). The result of the comparison between the average financial performance of companies with ERP's and those without in this sector indicated that the group with ERP's performed best (refer to section 6.3.3.1).

Sector 54

The data plots between ERP and ROC, ROA and ROE respectively for sector 54 indicate that there is a zero trend between environmental responsibility (as indicated by ERP) and financial performance (as indicated by ROC, ROA and ROE); i.e. environmental responsibility has no relationship to financial performance. The data plot between ERP and EVA indicates that there is no obvious trend between environmental responsibility (as indicated by ERP) and financial performance (as indicated by EVA). From the comparison between the average financial performance of companies with ERP's and those without in this sector, no clear trend could be identified (refer to table 6-18 under section 6.3.3).

Sector 56

The data plots between ERP and ROC, ROA and ROE respectively for sector 56 indicate that there is a zero trend between environmental responsibility (as indicated by ERP) and financial performance (as indicated by ROC, ROA and ROE); i.e. environmental responsibility has no relationship to financial performance. The data plot between ERP and EVA indicates that there is no obvious trend between environmental responsibility (as indicated by ERP) and financial performance (as indicated by EVA). The result of the comparison between the average financial performance of companies with ERP's and those without in this sector indicated that the group with ERP's performed best (refer to section 6.3.3.1).

Sector 58

The data plots between ERP and ROC, ROA, ROE and EVA respectively for sector 58 indicate that there is a zero trend between environmental responsibility (as indicated by ERP) and financial performance (as indicated by ROC, ROA, ROE and EVA); i.e. environmental responsibility has no relationship to financial performance. The result of the comparison between the average financial performance of companies with ERP's and those without in this sector indicated that the group with ERP's performed best (refer to section 6.3.3.1).

Sector 60

The data plots between ERP and ROA, ROE and EVA respectively for sector 60 indicate that there is a zero trend between environmental responsibility (as indicated by ERP) and financial performance (as indicated by ROC, ROA, ROE and EVA); i.e. environmental responsibility has no relationship to financial performance. The data plot between ERP and ROC indicates that there is a positive trend between environmental responsibility (as indicated by ERP) and financial performance (as indicated by ROC). The higher the environmental responsibility the higher is the financial performance. From the comparison

between the average financial performance of companies with ERP's and those without in this sector, no clear trend could be identified (refer to table 6-18 under section 6.3.3).

Sector 66

The data plots between ERP and ROC, ROA and ROE respectively for sector 66 indicate that there is a zero trend between environmental responsibility (as indicated by ERP) and financial performance (as indicated by ROC, ROA and ROE); i.e. environmental responsibility has no relationship to financial performance. The data plot between ERP and EVA indicates that there is no obvious trend between environmental responsibility (as indicated by ERP) and financial performance (as indicated by EVA). The result of the comparison between the average financial performance of companies with ERP's and those without in this sector indicated that the group with ERP's performed best (refer to section 6.3.3.1).

Sector 78

The data plots between ERP and ROC and between ERP and ROA for sector 78 indicate that there is a zero trend between environmental responsibility (as indicated by ERP) and financial performance (as indicated by ROC and ROA); i.e. environmental responsibility has no relationship to financial performance. The data plot between ERP and ROE indicates that there is a positive trend between environmental responsibility (as indicated by ERP) and financial performance (as indicated by ROE). The higher the environmental responsibility the better is the financial performance. The data plot between ERP and EVA indicates that there is no obvious trend between environmental responsibility (as indicated by ERP) and financial performance (as indicated by EVA).

Sector 80

The data plots between ERP and ROC, ROA, ROE and EVA respectively for sector 80 indicate that there is a zero trend between environmental responsibility (as indicated by ERP) and financial performance (as indicated by ROC, ROA, ROE and EVA); i.e. environmental responsibility has no relationship to financial performance. From the comparison between the average financial performance of companies with ERP's and those without in this sector, no clear trend could be identified (refer to table 6-18 under section 6.3.3).

Sector 86

The data plots between ERP and ROC, ROA and ROE respectively for sector 86 indicate that there is a zero trend between environmental responsibility (as indicated by ERP) and financial performance (as indicated by ROC, ROA and ROE); i.e. environmental responsibility has no relationship to financial performance. The data plot between ERP and EVA indicates that there is no obvious trend between environmental responsibility (as indicated by ERP) and financial performance (as indicated by EVA). The result of the comparison between the average financial performance of companies with ERP's and those without in this sector indicated that the group with ERP's performed best (refer to section 6.3.3.1).

6.3.4.4 Sectors with data plots for which no trends could be identified

The data plot below serves as an illustration of a data plot that indicates no trend; i.e. the data points are scattered over the data plot without any trend being obvious. Refer to appendix 6 for the other data plots discussed in this section.

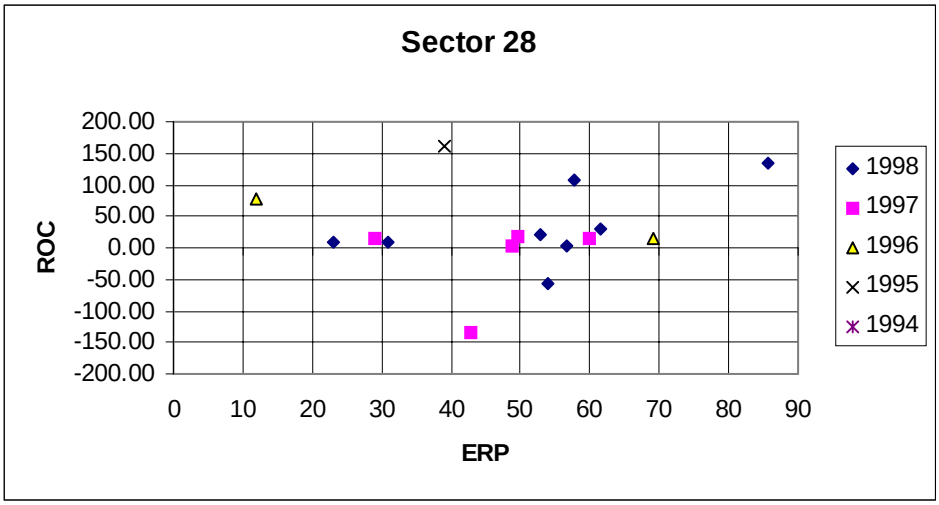


Figure 6.9

Sector 28

The data plots between ERP and ROC and between ERP and ROA for sector 28 indicate that there is no obvious trend between environmental responsibility (as indicated by ERP) and financial performance (as indicated by ROC and ROA). The data plot between ERP and ROE indicates a zero trend; i.e. environmental responsibility has no relationship to financial performance. From the comparison between the average financial performance of companies with ERP's and those without in this sector, the group with ERP's performed best (refer to section 6.3.3.1).

Sector 6

The data plots between ERP and ROC and between ERP and ROE for sector 6 indicate that there is no obvious trend between environmental responsibility (as indicated by ERP) and financial performance (as indicated by ROC and ROA). The data plot between ERP and ROA indicates that there is a positive trend between environmental responsibility (as indicated by ERP) and financial performance (as indicated by ROA). The higher the environmental responsibility the better is the financial performance. From the comparison between the average financial performance of companies with ERP's and those without in this sector, the group with ERP's performed best (refer to section 6.3.3.1).

6.3.5 Discussion of results of sector trend analyses

Table 6-20 provides an overview of the results of the sector trend analyses and facilitates the discussion thereof presented below (the terms positive, negative, zero, none and N/A have the same meanings as discussed under 6.3.4 above):

Results of sector trend analysis

Sector no	*Sector description*	*Level of environmental responsibility*	*Trend indicated by average financial performance*	*Trend indicated by data plots*
2	Coal	Good	N/A	N/A
6	Diamonds	Good	ERP group best	Positive/none
14	Gold	Good	N/A	N/A
24	Platinum	Good	N/A	Positive
28	Metals & minerals	Good	ERP group best	Zero/none
32	Mining holding & houses	Good	None	Zero/none
35	Mining exploration	Reasonable	None	N/A
39	Private equity funds	Little evidence	N/A	N/A
40	Banks	Little evidence	N/A	N/A
41	Financial services	No ERP	N/A	N/A
42	Life assurance	No ERP	N/A	N/A
43	Short-term insurance	Little evidence	N/A	N/A
44	Investment trusts	Little evidence	N/A	N/A
45	Redevelopment	No ERP	N/A	N/A
46	Property	Reasonable	ERP group best	N/A
48	Property unit trusts	Little evidence	N/A	N/A
49	Property loan stock	Little evidence	None	N/A

Table 6-20

Sector no	*Sector description*	*Level of environmental responsibility*	*Trend indicated by average financial performance*	*Trend indicated by data plots*
50	Diversified industrial	Reasonable	Group without ERP best	Zero/none
51	Service	Reasonable	Group without ERP best	N/A
52	Beverages	Reasonable	ERP group best	Zero/none
53	Hotels & leisure	Little evidence	Group without ERP best	Positive/none
54	Building, construction & engineering	Good	None	Zero/none
56	Chemicals, oils & plastics	Good	ERP group best	Zero/none
58	Clothing & textile	Reasonable	ERP group best	Zero
59	Development stage	No ERP	N/A	N/A
60	Electronics & electrical	Reasonable	None	Positive/zero
61	Information technology	Little evidence	None	Negative/zero
63	Telecommu-nications	Little evidence	N/A	N/A
66	Food	Good	ERP group best	Zero/none
67	Education & staffing	Little evidence	N/A	N/A
68	Furniture & appliances	Little evidence	None	N/A
69	Media	Little evidence	N/A	N/A
71	Packaging & printing	Reasonable	None	Positive/zero
73	Paper	Good	N/A	N/A
74	Healthcare	Little evidence	ERP group best	Positive
78	Steel	Good	N/A	Positive/zero/none
80	Retail	Little evidence	None	Zero
86	Transport	Reasonable	ERP group best	Zero/none

Table 6-20 (continued)

Sector no	*Sector description*	*Level of environmental responsibility*	*Trend indicated by average financial performance*	*Trend indicated by data plots*
87	Cash companies	No ERP	N/A	N/A
88	Development capital	Little evidence	N/A	N/A
89	Venture capital	Little evidence	N/A	N/A

Table 6-20(continued)

6.3.5.1 Sectors where environmental responsibility indicates an advantage

Thirteen sectors were identified from table 6-20 above that indicate that environmental responsibility is an advantage. In the following nine sectors the group with ERP's performed better than the group without the ERP's when average financial performance was compared (refer to section 6.3.3):

Sector no	*Sector description*
6	Diamonds
28	Metals and minerals
46	Property
52	Beverages
56	Chemicals, oils & plastics
58	Clothing & textile
66	Food
74	Healthcare
86	Transport

Except for sector 74 the data plots prepared for the above-mentioned sectors did not provide additional evidence to support the hypothesis that the higher the environmental responsibility of a company is, the higher is the financial performance of that company. Sector 6 has one positive data plot. Sectors 6 and 28 were classified as sectors for which no trends could be identified from the data plots (refer to section 6.3.4.4). Sector 46 did not have sufficient data to prepare data plots. Sectors 52, 56, 58, 66 and 86 were classified as sectors with a zero trend, i.e. no relationship exists between environmental responsibility and financial

performance (refer to section 6.3.4.3). However, all the data plots for sector 74 have a positive trend, which means that the higher the environmental responsibility is, the higher is the financial performance.

The following four sectors have positive data plots:

Sector no	*Sector description*
24	Platinum
60	Electronics & electrical
71	Packaging & printing
78	Steel

For sectors 24 and 78 there are good evidence of environmental responsibility (refer to section 6.3.1.4), but because all the companies in these sectors have ERP's no average financial performance trend analysis could be performed for these sectors. Sector 24 was classified as a sector with a positive trend, i.e. the higher the environmental responsibility, the higher the financial performance and vice versa (refer to section 6.3.4.1). Sector 78 was classified as a sector with a zero trend (refer to section 6.3.4.3), but has one positive data plot.

For sectors 60 and 71 there are reasonable evidence of environmental responsibility. However, no trends could be identified in the average financial performance trend analysis (refer to section 6.3.3). Sector 60 was classified as a sector with a zero trend (refer to section 6.3.4.3), but has one positive data plot. Sector 71 was classified as a sector with a positive trend, i.e. the better the environmental responsibility, the better the financial performance and vice versa (refer to section 6.3.4.1).

It could be argued that the companies in the mining-related sectors (6, 24 and 28), as well as sectors 56 (Chemicals, oils & plastics) and 78 (Steel) are environmentally responsible because their financial performance will be adversely affected by fines if they are not environmentally responsible (stakeholder pressure by government and its agencies – section 2.3.2). From section 2.3.2 it is clear that environmental legislation is improving in South Africa – the mining sectors are now

required to compete on an equal legal footing with other interests for the use of the country's water, land or mineral resources.

Sector 46 (Property) could have been influenced by the devastating effect of Superfund (refer to section 2.3.2 and section 2.3.7) on property-owners, their insurers and their bankers in the U.S.A with regard to the clean-up of already polluted sites.

Sectors 52 (Beverages), 58 (Clothing & textile) and 66 (Food) are probably influenced by the "green consumer" – refer to section 2.3.4. It is possible that the companies with ERP's have better financial performance than the companies without ERP's due to the support of customers who are concerned about the environmental responsibility of the companies that they support. It is striking that the products sold by these sectors have a very direct impact on the consumer that could influence the consumer's "green" conscience.

Sector 60 (Electronics & electrical) could have been influenced by the laws passed by some European governments to make manufacturers and importers responsible for their products when consumers discard electronic products (refer to section 3.3.2.8).

Sector 71 (Packaging & printing) is probably influenced by the world-wide demand for more environmentally friendly packaging (refer to section 2.4.2 under "Enhanced revenues"). Sector 86 (Transport) could be influenced by the pressure to eliminate or neutralize greenhouse gas emissions (refer to section 3.3.2.10).

Whatever the motivation of the companies in the 13 sectors mentioned above 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 as described in section 2.4.2.

6.3.5.2 Sectors where environmental responsibility indicates a disadvantage

From table 6-20 above four sectors indicate that environmental responsibility is a disadvantage. In the following three sectors the group without ERP's performed better than the group with ERP's when average financial performance was compared (refer to section 6.3.3):

Sector no	*Sector description*
50	Diversified industrial
51	Service
53	Hotels & leisure

The data plots prepared for the above-mentioned sectors did not provide additional evidence to support a hypothesis of environmental responsibility being a disadvantage. Sector 50 was classified as a sector with a zero trend (refer to section 6.3.4.3). There was insufficient data to prepare data plots for sector 51. Two of the data plots for sector 53 is slightly positive, while no definite trend could be identified from the other two data plots.

Sector 61 (Information technology) was classified as a sector with a negative trend (refer to section 6.3.4.2). There is little evidence of environmental responsibility (refer to section 6.3.1.2) and no trend could be identified in the average financial performance trend analysis (refer to section 6.3.3).

According to Huckle (1995: 86; 89) the priority given to environmental legislation in South Africa is lower than internationally due to more pressing concerns, such as housing, education and crime reduction. The likelihood of more effective environmental legislation and a stronger relationship between environmental performance and profitability will increase as primary needs are addressed and environmental conservation becomes more of a priority (Huckle 1995: 90).

The National Water Act 36 of 1998 (discussed in section 2.3.2) is an example of stricter environmental legislation in South Africa. This act includes the polluter pays principle that is the basis of the Superfund Act of the U.S.A. and puts pressure on especially the mining-related sectors (refer to section 6.3.5.1).

Contrary to the sectors discussed in section 6.3.5.1, for which stakeholder pressure was identified, the sectors in this section are not subject to the same level of stakeholder pressure. These sectors do not appear to have such a direct impact on the environment or on the consumer as those discussed in section 6.3.5.1 above, and consequently the consumer's "green" conscience does not have an impact here.

Environmental legislation does not really affect these sectors, therefore the companies that spend money to be environmentally responsible have poorer financial performance (refer to section 2.4.1 – disadvantages of environmental responsibility). 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.

6.3.5.3 Other sectors

The sectors discussed in this section are those for which there is not enough evidence to identify whether environmental responsibility is an advantage or a disadvantage where financial performance is concerned.

For sectors 2 (Coal), 14 (Gold) and 73 (Paper) no average financial performance trend analysis or data plots could be prepared due to insufficient information. These sectors as well as sector 32 (Mining holding and houses) and sector 54 (Building, construction & engineering) have good evidence of environmental responsibility (refer to section 6.3.1.2), while sector 35 (Mining exploration) has reasonable evidence of environmental responsibility. No trends were identified for sectors 32, 35 and 54 in the average financial performance trend analysis (refer to section 6.3.3). The data plots for sectors 32 and 54 indicated zero trends (refer to section 6.3.4.3), while sector 35 has insufficient data to prepare data plots.

Sectors 49 (Property loan stock), 68 (Furniture & appliances) and 80 (Retail) have little evidence of environmental responsibility and no trends were identified in the

average financial performance trend analysis. No data plots were prepared for sectors 49 and 68 due to insufficient data. A zero trend could be identified from the data plots for sector 80 (refer to section 6.3.4.3).

For fifteen sectors (39, 40, 41, 42, 43, 44, 45, 48, 59, 63, 67, 69, 87, 88 and 89) no average financial performance trend analysis or data plots were prepared (indicated with N/A in table 6.20). Five of these sectors (41, 42, 45, 59 and 87) do not have ERP's (refer to section 6.3.1.1). Ten of these sectors (39, 40, 43, 44, 48, 63, 67, 69, 88 and 89) have such little evidence of environmental responsibility that they were not selected for the average financial performance trend analysis (refer to section 6.3.3). These ten sectors also did not have sufficient data for data plots.

6.3.6 Summary and conclusion for sector trend analyses

The average financial performance measures for the group of environmentally responsible companies in a sector were compared to the other group of companies in the sector without environmental reporting percentages. The sectors selected for this analysis were identified in section 6.3.1.5 (based on the work done relating to environmental responsibility per sector). Data plots per sector were prepared to provide additional evidence relating to the relationship between environmental responsibility and financial performance.

Based on the comparison of average financial performance and the data plots it was found that for the following 13 sectors environmental responsibility is an advantage where financial performance is concerned:

Sector no	*Sector description*
6	Diamonds
24	Platinum
28	Metals and minerals
46	Property
52	Beverages
56	Chemicals, oils & plastics
58	Clothing & textile

60	Electronics & electrical
66	Food
71	Packaging & printing
74	Healthcare
78	Steel
86	Transport

For almost all of the above-mentioned sectors stakeholder pressure could be identified. 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 as described in section 2.4.2.

Based on the comparison of average financial performance and the data plots it was found that for the following four sectors environmental responsibility is a disadvantage where financial performance is concerned:

Sector no	*Sector description*
50	Diversified industrial
51	Service
53	Hotels & leisure
61	Information technology

These sectors 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 as those discussed in section 6.3.5.1 above, and consequently the consumer's "green" conscience does not have an impact here.

Environmental legislation does not really affect these sectors, therefore the companies that spend money to be environmentally responsible have a poorer financial performance (refer to section 2.4.1 – disadvantages of environmental responsibility). 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.

For fifteen sectors no average financial performance trend analysis or data plots were prepared due to no or very little evidence of environmental responsibility. If these sectors 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.

6.4 FINAL SUMMARY AND CONCLUSIONS

The review of the related literature identified the following stakeholders 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.

These stakeholders are placing increasing pressure on companies to be environmentally responsible. Specific pressures towards environmental responsibility were discussed in section 3.3.1, while pressures can also be identified from the discussion of the stakeholders interested in environmental reporting in section 2.3. 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: 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. The progress made by such companies (discussed in section 3.3.2) include the following areas:

- Environmental management systems and audits thereof
- 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 (Initiative for chemical industry)
- “Green alliance” partnerships between businesses and environmental groups.

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.

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 (refer to section 5.5.2).

The results of the correlation analyses are in line with previous research results (discussed in section 2.5). 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 & McLauglin (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 (refer to section 5.3). 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 (refer to section 2.3.2). 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 as described in section 2.4.2. Allen (1994) found that enhanced financial performance of environmentally responsible firms appears to be attributable to stakeholder-agency considerations (refer to section 2.5).

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 (refer to section 2.4.1 – disadvantages of environmental responsibility). 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.

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.

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 a 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 & McLauglin (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 a 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.

APPENDIX 1

CONTROL LIST

CATEGORY	NO.	QUESTION
Policy/mission statement	1	Does the corporate policy/mission statement mention a policy/mission regarding the environment?
Environmental objectives	2.1	Are the company's environmental objectives disclosed?
	2.2	Does the company disclose any environmental matters regarding the following: Emission levels; energy consumption; noise levels; waste production; recycling; or other?
	2.3	If the environmental objectives are disclosed, do they set measurable standards so that the environmental performance achieved may be compared to the objectives?
	2.4	Has the company disclosed if it has met its objectives regarding the environment?

CONTROL LIST (CONTINUED)

CATEGORY	NO.	QUESTION
Environmental activities	3.1	Is mention made of the environmental impacts and risks of the business?
	3.1.1	If the impacts and risks of the business are disclosed, was the information broken down on a site by site basis as opposed to a company wide basis?
	3.2	Is mention made of specific projects undertaken?
	3.3	Is mention made of any negative aspects of environmental activities?
	3.4	If mention is made of any compliance with a standard what standard is mentioned: Legal standard; industry standard; company standard; or other standard?
	3.5	Is any mention made of external awards received regarding environmental activities?
	3.6	When environmental information is disclosed, does it encompass the core business activities of the company?

CONTROL LIST (CONTINUED)

CATEGORY	NO.	QUESTION
Environmental financial disclosure	4.1	If financial information is provided in respect of environmental expenditures, are details of operating expenditure and/or capital expenditure supplied?
	4.1.1	If details of operating expenditure are disclosed, which of the following classifications are made: Liquid effluent treatment; waste gas and air treatment; solid waste treatment; analysis, control and compliance; remediation; recycling; research and development; or other?
	4.1.2	If details of capital expenditure are disclosed, which of the following classifications are made: Liquid effluent treatment; waste gas and air treatment; solid waste treatment; analysis, control and compliance; remediation; recycling; or other?
	4.2	When financial information is disclosed, are comparative figures supplied?
	4.3	Have any transfers been made to a reserve regarding future environmental expenditure?
	4.4	Is any mention made of a contingency regarding an environmental liability?

CONTROL LIST (CONTINUED)

CATEGORY	NO.	QUESTION
Environmental financial disclosure	4.5	Are the accounting policy notes regarding environmental accounting disclosed?
	4.5.1	If accounting policy notes are disclosed, specify in respect of which item(s)?
Audit reports	5.1	Is mention made of an environmental audit?
	5.1.1	If an environmental audit is conducted, is it independently (external) attested?
	5.1.2	If an environmental audit is conducted, is there any indication of how often the audit will be undertaken?

APPENDIX 2

JUDGEMENT SCALE

QUESTION NO. IN CONTROL LIST	MARKS PER DIMENSION			TOTAL MARKS AWARDED
	EVIDENCE	TIME	SPECIFICITY	
1	1	2	1	4
2.1	1	2	2	5
2.2	2	2	2, 1 additional mark possible	6, maximum 7
2.3	2	2	2	6
2.4	1	1	2	4
3.1	1	2	2	5
3.1.1	1	1	2	4
3.2	1	1	2	4
3.3	1	1	2	4
3.4	2	1	2, 1 additional mark possible	5, maximum 6
3.5	1	1	2	4
3.6	1	1	2	4

JUDGEMENT SCALE (CONTINUED)

QUESTION NO. IN CONTROL LIST	MARKS PER DIMENSION			TOTAL MARKS AWARDED
	EVIDENCE	TIME	SPECIFICITY	
4.1	3	1	2, 1 additional mark possible	6, maximum 7
4.1.1	3	1	2, 1 additional mark possible	6, maximum 7
4.1.2	3	1	2, 1 additional mark possible	6, maximum 7
4.2	3	1	2	6
4.3	3	1	2	6
4.4	3	2	2	7
4.5	2	1	2	5
4.5.1	2	1	2, 1 additional mark possible	5, maximum 6
5.1	2	1	2	5
5.1.1	2	1	2	5
5.1.2	1	2	2	5

APPENDIX 3

APPENDIX 3.1

TOTAL QUALIFYING POPULATION

COMPANY	ERP 1994	ERP 1995	ERP 1996	ERP 1997	ERP 1998	No. YEARS	AV. ERP
ABI				26	29	2	27
ABSA				28	14	2	21
ADCOCK	12	47	23	13	18	5	23
AECI	78	80	81	78	88	5	81
AFLIFE			32			1	32
AFR-LEASE					49	1	49
ALEXNDR		44	55	32	14	4	36
ALTECH		11				1	11
ALTRON			33			1	33
ALUDIE					28	1	28
AMGOLD		14				1	14
AMPLATS		69	85	79	95	4	82
ANGGOLD	70	72	76	79	100	5	79
ANGLO-AM	71	50	72	72	78	5	69
APEX					14	1	14
ASPEN				3	14	2	9
ASS-MANG				60	62	2	61
ASSORE				63	67	2	65
AVGOLD		14		44	44	3	34
A-V-I	51	21	12	22	41	5	30
AVIS					14	1	14
AVMIN	36	41	53	48	43	5	44
BARLOWS	56		20			2	38
BARNEX				16		1	16
BARPLAT				38	47	2	43
BARPROP				13	14	2	14
BASREAD				17	19	2	18

TOTAL QUALIFYING POPULATION (CONTINUED)

COMPANY	ERP 1994	ERP 1995	ERP 1996	ERP 1997	ERP 1998	No. YEARS	AV. ERP
BATEPRO				22	41	2	32
BEARMAN		21	17	9		3	16
BELL			22	13	25	3	20
BENCO					23	1	23
BICAF				21	14	2	18
BIDVEST		33			4	2	18
BILLITON					48	1	48
BUILDMAX					14	1	14
CADSWEP			57	34	47	3	46
CEMENCO					14	1	14
CGS-FOOD		21	17		22	3	20
CGSMITH		17		19	27	3	21
CHEMSERVE	53	21	69	35	19	5	39
CHOICE					14	1	14
CITYLDG			17		11	2	14
CLYDE					23	1	23
COASTAL				17	27	2	22
COATES					25	1	25
CONAFEX					4	1	4
CONFRAM				37	51	2	44
CON-MURCH		39	12	43	54	4	37
CONSHU					18	1	18
CONTROL		14			18	2	16
CORNICK		26		3		2	15
CROOKES				20	38	2	29
CULLINAN				26	18	2	22
CUSAF		63				1	63
DBN-DEEP			61	41	86	3	63
DEBEERS	49	60	52	42	71	5	55
DELFOOD		22	28	26	40	4	29
DISTIL			24	26	33	3	28
DORBYL					14	1	14

TOTAL QUALIFYING POPULATION (CONTINUED)

COMPANY	ERP 1994	ERP 1995	ERP 1996	ERP 1997	ERP 1998	No. YEARS	AV. ERP
DRIES		35	73	52	61	4	55
DUIKERS	74	81	74	62	90	5	76
DUNLOP					10	1	10
E-DAGGA		17		46	46	3	36
EDGARS		37	42	8	31	4	29
ED-LBATE		40				1	40
EDUCOR					24	1	24
EERSLNG					41	1	41
ELLERINE		26	30	13	29	4	24
ENSERV					56	1	56
E-R-P-M	56	8	72	68	74	5	56
FALCON				7		1	7
FELTEX				30	14	2	22
FORBES				9		1	9
FRALEX					14	1	14
FRAME			46	37	51	3	45
FRIDGEM				43	38	2	41
G5HOLD		14				1	14
GEFCO				66	71	2	68
GEM					19	1	19
GENCOR	63	56	77	63	34	5	59
GEN-OPTIC					14	1	14
GFIELDS					57	1	57
GFSA		34	33	45	46	4	40
GLODINA				38	32	2	35
GRINAKER				17	28	2	22
GRINCOR	23	56	49	14	24	5	33
GRINTEK			17	25	29	3	24
GROUP-5		17			24	2	21
GUNDLE					8	1	8
HARMONY	25	17	60	69	66	5	48
HARWILL				24	19	2	22

TOTAL QUALIFYING POPULATION (CONTINUED)

COMPANY	ERP 1994	ERP 1995	ERP 1996	ERP 1997	ERP 1998	No. YEARS	AV. ERP
HIVELD	51	72	77	62	66	5	66
HLH	44					1	44
I-&-J	21	13	17	24	27	5	20
ILLOVO	21	23	33	38	42	5	32
IMPLATS	59	58	73	74	87	5	70
INVICTA					8	1	8
IOTA				17		1	17
ISCOR	65	76	77	71	82	5	74
JASCO					10	1	10
JDGROUP		20			14	2	17
JOHNNIC	41				19	2	30
KALGOLD					54	1	54
KELGRAN			69	50	57	3	58
KERSAF		18	17	22	27	4	21
KH-PROPS					13	1	13
KOLOSUS				28	19	2	24
KTL		14	63	25	18	4	30
LANGEBERG	17					1	17
LASER		17		3		2	10
LIONMATCH		62	30	41	56	4	47
LOGTEK					14	1	14
LONMIN PL				58	28	2	43
L-T-A		38				1	38
M&R-HLD	30	44	29	7	14	5	25
MACMED			17			1	17
MALBAK		15	19	9	14	4	14
MARANDA					58	1	58
MARLIN				29	23	2	26
MASONITE	45	46	55	46	63	5	51
MAWENZI					26	1	26
MCRTAIL				9	14	2	12
MEDEX		32	17			2	25

TOTAL QUALIFYING POPULATION (CONTINUED)

COMPANY	ERP 1994	ERP 1995	ERP 1996	ERP 1997	ERP 1998	No. YEARS	AV. ERP
MESSINA				38	42	2	40
MINORCO	21	43		34	23	4	30
MLNHOLD					31	1	31
MOLOPE					4	1	4
MSAULI				49	53	2	51
NAMFISH				17	19	2	18
NAMPAK	61	41	38	29	33	5	40
NAMSEA				17	19	2	18
NATCHIX				25	28	2	26
NEDCOR	38	13				2	26
NEI-AFR					9	1	9
NETCARE					4	1	4
NEW-MIN				13	39	2	26
NINIAN				32	32	2	32
NORTHAM		30	17	64	54	4	41
OCFISH				32	39	2	36
ODMHOLD			48	28	39	3	39
OMNIA				41	39	2	40
OTK					4	1	4
OTR					29	1	29
PALAMIN	63	71	80	74	86	5	75
PALS					14	1	14
PETMIN				36	31	2	33
PICKNPAY	48			17		2	33
PLATE-GL	17	14	61	14	14	5	24
POLIFIN		60	73	52	75	4	65
PORTHLD					30	1	30
POWTECH	44					1	44
PPC	51	32	62	60	60	5	53
PREM-GRP	17					1	17
PRIMATOY					15	1	15
PRIME					11	1	11

TOTAL QUALIFYING POPULATION (CONTINUED)

COMPANY	ERP 1994	ERP 1995	ERP 1996	ERP 1997	ERP 1998	No. YEARS	AV. ERP
PROSPUR					38	1	38
RAI			20			1	20
RAINBOW	16					1	16
RANDFONTN			44	57	85	3	62
RANGOLD		18			61	2	39
RARECO				16	37	2	26
REMBR-BEH	25	20		32	30	4	27
REMGRO	21	41			30	3	31
RLSPROPS					43	1	43
RMP-PROP	72		71	77	8	4	57
ROADCOR					27	1	27
SAB	17		21	30	76	4	36
SABVEST				9	14	2	12
SA-EAGLE		14		16	30	3	20
SAFREN	40		10	13	22	4	21
SAGEGRP	16					1	16
SAIL					4	1	4
SALLIES					27	1	27
SAMROC					10	1	10
SANTAM	19					1	19
SAPPI	65	62	69	74	60	5	66
SASOL	51	55	64	61	74	5	61
SBIC					14	1	14
SCHAMIN	17	44			19	3	27
SCHARIG					19	1	19
SEAHARV			50	3	18	3	24
SEARDEL			28	44	14	3	29
SETHOLD					35	1	35
SFW					27	1	27
SHARIND					18	1	18
SILTEK	21	13	34	13	23	5	21
SIMMERS				52	65	2	59

TOTAL QUALIFYING POPULATION (CONTINUED)

COMPANY	ERP 1994	ERP 1995	ERP 1996	ERP 1997	ERP 1998	No. YEARS	AV. ERP
SISA			21			1	21
SONDOR				13	18	2	16
STANTRN		32				1	32
ST-HELENA		25	62	77	82	4	61
STILFTN				70	67	2	69
SUPRGRP					14	1	14
TEGKOR	22				40	2	31
TELJOY					17	1	17
THABEX					14	1	14
TIB	21				40	2	31
TIGR-OATS		26	21	25	23	4	24
TONGAAT	22		41	32	29	4	31
TOURVST				9	18	2	14
TOYOTA	23				8	2	15
TRENCOR	15					1	15
TRNPACO				18	19	2	19
TRNSHEX				52	61	2	56
UNISPIN				21	19	2	20
UNITRAN					8	1	8
USKO		11				1	11
VILLAGE				63	49	2	56
VOGELS					30	1	30
VOLTEX				28	30	2	29
WACO					13	1	13
WANKIE				66	55	2	60
WBHO					24	1	24
WBHOLD				17	32	2	24
WES-AREAS		30	42	63	91	4	57
WINBEL					8	1	8
WOOLIES				9		1	9
W-R-CONS				48	50	2	49
YORKCOR				33	28	2	31

APPENDIX 3.2

TOTAL POPULATION EXCLUDING WILD POINTS

COMPANY	ERP 1994	ERP 1995	ERP 1996	ERP 1997	ERP 1998	No. YEARS	AV. ERP
ABI				26	29	2	27
ABSA				28	14	2	21
ADCOCK	12	47	23	13	18	5	23
AECI	78	80	81	78	88	5	81
ALEXNDR		44	55	32	14	4	36
AMPLATS		69	85	79	95	4	82
ANGGOLD	70	72	76	79	100	5	79
ANGLO-AM	71	50	72	72	78	5	69
ASPEN				3	14	2	9
ASS-MANG				60	62	2	61
ASSORE				63	67	2	65
AVGOLD		14		44	44	3	34
A-V-I	51	21	12	22	41	5	30
AVMIN	36	41	53	48	43	5	44
BARPLAT				38	47	2	43
BARPROP				13	14	2	14
BASREAD				17	19	2	18
BATEPRO				22	41	2	32
BEARMAN		21	17	9		3	16
BELL			22	13	25	3	20
BICAF				21	14	2	18
CADSWEP			57	34	47	3	46
CGSMITH		17		19	27	3	21
CHEMSERVE	53	21	69	35	19	5	39
COASTAL				17	27	2	22
CONFRAM				37	51	2	44
CON-MURCH		39	12	43	54	4	37

TOTAL POPULATION EXCLUDING WILD POINTS (CONTINUED)

COMPANY	ERP 1994	ERP 1995	ERP 1996	ERP 1997	ERP 1998	No. YEARS	AV. ERP
CROOKES				20	38	2	29
CULLINAN				26	18	2	22
DBN-DEEP			61	41	86	3	63
DEBEERS	49	60	52	42	71	5	55
DELFOOD		22	28	26	40	4	29
DISTIL			24	26	33	3	28
DRIES		35	73	52	61	4	55
DUIKERS	74	81	74	62	90	5	76
E-DAGGA		17		46	46	3	36
EDGARS		37	42	8	31	4	29
ELLERINE		26	30	13	29	4	24
E-R-P-M	56	8	72	68	74	5	56
FELTEX				30	14	2	22
FRAME			46	37	51	3	45
FRIDGEM				43	38	2	41
GEFCO				66	71	2	68
GENCOR	63	56	77	63	34	5	59
GFSA		34	33	45	46	4	40
GLODINA				38	32	2	35
GRINAKER				17	28	2	22
GRINCOR	23	56	49	14	24	5	33
GRINTEK			17	25	29	3	24
HARMONY	25	17	60	69	66	5	48
HARWILL				24	19	2	22
HIVELD	51	72	77	62	66	5	66
I-&-J	21	13	17	24	27	5	20
ILLOVO	21	23	33	38	42	5	32
IMPLATS	59	58	73	74	87	5	70
ISCOR	65	76	77	71	82	5	74
KELGRAN			69	50	57	3	58
KERSAF		18	17	22	27	4	21
KOLOSUS				28	19	2	24

TOTAL POPULATION EXCLUDING WILD POINTS (CONTINUED)

COMPANY	ERP 1994	ERP 1995	ERP 1996	ERP 1997	ERP 1998	No. YEARS	AV. ERP
KTL		14	63	25	18	4	30
LIONMATCH		62	30	41	56	4	47
LONMIN PL				58	28	2	43
M&R-HLD	30	44	29	7	14	5	25
MALBAK		15	19	9	14	4	14
MARLIN				29	23	2	26
MASONITE	45	46	55	46	63	5	51
MCRTAIL				9	14	2	12
MESSINA				38	42	2	40
MINORCO	21	43		34	23	4	30
MSAULI				49	53	2	51
NAMFISH				17	19	2	18
NAMPAK	61	41	38	29	33	5	40
NAMSEA				17	19	2	18
NATCHIX				25	28	2	26
NEW-MIN				13	39	2	26
NINIAN				32	32	2	32
NORTHAM		30	17	64	54	4	41
OCFISH				32	39	2	36
ODMHOLD			48	28	39	3	39
OMNIA				41	39	2	40
PALAMIN	63	71	80	74	86	5	75
PETMIN				36	31	2	33
PLATE-GL	17	14	61	14	14	5	24
POLIFIN		60	73	52	75	4	65
PPC	51	32	62	60	60	5	53
RANDFONTN			44	57	85	3	62
RARECO				16	37	2	26
REMBR-BEH	25	20		32	30	4	27
RMP-PROP	72		71	77	8	4	57
SAB	17		21	30	76	4	36
SABVEST				9	14	2	12

TOTAL POPULATION EXCLUDING WILD POINTS (CONTINUED)

COMPANY	ERP 1994	ERP 1995	ERP 1996	ERP 1997	ERP 1998	No. YEARS	AV. ERP
SA-EAGLE		14		16	30	3	20
SAFREN	40		10	13	22	4	21
SAPPI	65	62	69	74	60	5	66
SASOL	51	55	64	61	74	5	61
SEAHARV			50	3	18	3	24
SEARDEL			28	44	14	3	29
SILTEK	21	13	34	13	23	5	21
SIMMERS				52	65	2	59
SONDOR				13	18	2	16
ST-HELENA		25	62	77	82	4	61
STILFTN				70	67	2	69
TIGR-OATS		26	21	25	23	4	24
TONGAAT	22		41	32	29	4	31
TOURVST				9	18	2	14
TRNPACO				18	19	2	19
TRNSHEX				52	61	2	56
UNISPIN				21	19	2	20
VILLAGE				63	49	2	56
VOLTEX				28	30	2	29
WANKIE				66	55	2	60
WES-AREAS		30	42	63	91	4	57
W-R-CONS				48	50	2	49
YORKCOR				33	28	2	31

APPENDIX 3.3

COMPANIES REPORTING ON ENVIRONMENTAL MATTERS FOR FOUR TO FIVE YEARS

COMPANY	ERP 1994	ERP 1995	ERP 1996	ERP 1997	ERP 1998	No. YEARS	AV. ERP
ADCOCK	12	47	23	13	18	5	23
AECI	78	80	81	78	88	5	81
ALEXNDR		44	55	32	14	4	36
AMPLATS		69	85	79	95	4	82
ANGGOLD	70	72	76	79	100	5	79
ANGLO-AM	71	50	72	72	78	5	69
A-V-I	51	21	12	22	41	5	30
AVMIN	36	41	53	48	43	5	44
CHEMSERVE	53	21	69	35	19	5	39
CON-MURCH		39	12	43	54	4	37
DEBEERS	49	60	52	42	71	5	55
DELFOOD		22	28	26	40	4	29
DRIES		35	73	52	61	4	55
DUIKERS	74	81	74	62	90	5	76
EDGARS		37	42	8	31	4	29
ELLERINE		26	30	13	29	4	24
E-R-P-M	56	8	72	68	74	5	56
GENCOR	63	56	77	63	34	5	59
GFSA		34	33	45	46	4	40
GRINCOR	23	56	49	14	24	5	33
HARMONY	25	17	60	69	66	5	48
HIVELD	51	72	77	62	66	5	66
I-&-J	21	13	17	24	27	5	20
ILLOVO	21	23	33	38	42	5	32
IMPLATS	59	58	73	74	87	5	70
ISCOR	65	76	77	71	82	5	74

COMPANIES REPORTING ON ENVIRONMENTAL MATTERS FOR FOUR TO FIVE YEARS (CONTINUED)

COMPANY	ERP 1994	ERP 1995	ERP 1996	ERP 1997	ERP 1998	No. YEARS	AV. ERP
KERSAF		18	17	22	27	4	21
KTL		14	63	25	18	4	30
LIONMATCH		62	30	41	56	4	47
M&R-HLD	30	44	29	7	14	5	25
MALBAK		15	19	9	14	4	14
MASONITE	45	46	55	46	63	5	51
MINORCO	21	43		34	23	4	30
NAMPAK	61	41	38	29	33	5	40
NORTHAM		30	17	64	54	4	41
PALAMIN	63	71	80	74	86	5	75
PLATE-GL	17	14	61	14	14	5	24
POLIFIN		60	73	52	75	4	65
PPC	51	32	62	60	60	5	53
REMBR-BEH	25	20		32	30	4	27
RMP-PROP	72		71	77	8	4	57
SAB	17		21	30	76	4	36
SAFREN	40		10	13	22	4	21
SAPPI	65	62	69	74	60	5	66
SASOL	51	55	64	61	74	5	61
SILTEK	21	13	34	13	23	5	21
ST-HELENA		25	62	77	82	4	61
TIGR-OATS		26	21	25	23	4	24
TONGAAT	22		41	32	29	4	31
WES-AREAS		30	42	63	91	4	57

APPENDIX 4

APPENDIX 4.1

FINANCIAL PERFORMANCE DATA – ROC

COMPANY	1998	1997	1996	1995	1994
ABACUS	14.90	21.70			
ABI	24.79	19.32	19.14	22.83	20.89
ABRAXAS	24.71				
ABSA	9.62	9.54	11.65	6.94	7.09
ACREM	5.93	3.84	9.07	1.36	0.67
ADCOCK	37.79	34.03	27.34	33.81	29.01
ADCORP	26.95	29.78	27.06	8.12	2.82
ADMIRAL	-45.60	-19.65	2.00		
ADONIS	6.12	7.27	8.10	20.65	5.74
ADVED	18.02	9.79			
ADVSOURCE	113.03	92.97	18.77	-42.69	21.38
ADVTECH	30.83	23.54	15.73	2.36	0.61
AECI	-4.95	10.85	17.41	9.01	20.78
AF-&-OVER	12.09	9.60	9.84	10.60	10.33
AFBRAND	21.64				
AF-HARV	11.19	0.00			
AFLIFE	8.92	4.97	4.44	5.81	6.09
AFROX	14.44	15.19	16.41	14.57	13.32
AIDA	57.91	-56.11	-18.99	13.26	7.04
ALEXNDR	14.95	42.43	24.25	26.07	17.26
ALEXWYT	-14.60	1.41	0.71	6.10	5.56
ALIANCE	31.53	27.29			
ALTECH	28.12	18.29	1.04	11.91	11.82
ALTRON	20.83	16.03	7.85	16.97	15.69
ALUDIE	111.67	8.44	2.20	11.28	
AMAPROP	-8.75	1.34	-0.36	2.68	2.52
AMAPS	19.32	27.84			
AMB	10.88				
AME	79.70	B	B	B	B
AMGOLD	25.55	36.79	35.83	48.60	48.49
AMLAC	-15.82	22.96	37.11		
AMMGROUP	13.36				
AMPLATS	96.95	53.40	71.67	99.49	92.18
ANAMINT	7.52	9.79	8.31	7.99	8.26|
ANBEECO	4.76	4.11	18.10	16.06	6.87

FINANCIAL PERFORMANCE DATA – ROC (CONTINUED)

COMPANY	1998	1997	1996	1995	1994
ANGLO-AM	12.44	15.64	12.28	11.04	10.84
APEX	2.85	2.00	11.75	13.13	10.28
APLITEC	5.42				
AQUILA	-1.49	-2.38			
ARIES	19.98	35.79	22.63	26.10	23.67
AROMA	-25.78	0.09	15.29	10.92	8.47
ASPEN	-46.06	5.52	21.40	76.05	19.98
ASS-MANG	28.71	15.07	40.48	18.51	19.16
ASSORE	7.25	8.29	9.09	10.53	8.82
ASTRAPAK	18.57				
ATLAS	0.25	0.09	0.10	-0.06	-0.79
AUTOPGE	12.68	12.84	10.32	-7.63	24.93
AUTOQIP	23.03	25.26	22.89	20.83	14.95
A-V-I	8.79	12.71	17.21	15.71	21.18
AVIS	24.26	23.67	21.72		
AVMIN	4.77	14.86	16.03	13.85	14.69
AWETHU	26.58				
BARLOWS	11.74	13.66	12.28	11.23	4.80
BARNEX	B	-94.88	1.25	3.89	2.03
BARPLAT	-16.94	2.24	2.31	-4.97	-7.22
BARPROP	0.03				
BASREAD	60.47	57.18	29.46	-61.99	-126.04
BATECOR	11.96	7.79	-42.44	31.29	
BATEPRO	30.43	31.00	87.89	30.17	13.28
BATSA	36.43	15.36	11.95	8.99	185.81
BEARMAN	14.60	20.35	26.65	29.34	24.22
BEIGE	20.40				
BELL	-16.63	6.45	11.97	12.30	
BENCO	-7.62	17.27	9.54	-3.62	-9.37
BEVCON	8.69	8.50	8.87	7.78	6.47
BICAF	21.21	1.93	-5.85	9.92	26.93
BIDVEST	18.52	16.88	23.68	22.39	19.96
BILLCAD		25.52			
BILLITON	9.88				
BIVEC	-1.32	3.38	2.13	1.31	1.02
BJM	15.04				
BOE	25.70	5.98	15.83	20.76	17.00

FINANCIAL PERFORMANCE DATA – ROC (CONTINUED)

COMPANY	1998	1997	1996	1995	1994
BOECORP	3.07	4.53	6.76	5.77	5.01
BOLTONS	9.25	5.63	8.04	20.14	9.27
BOLWEAR	9.69	5.78	7.34	31.61	7.60
BONATLA	0.43				
BOTREST	-9538.20	-2054.86	-6404.35	-1318.51	-814.13
BOUMAT	-8.18	2.99	3.23	18.65	8.18
BOWCALF	23.68	20.20	17.89	20.01	31.28
BRAIT	52.20	8.23	5.09	3.88	-11.23
BRANDCO	26.52	175.17	2491.57	2160.00	2682.35
BRIMSTON	5.84				
BRNWARE	44.63				
BUILDMAX	-5.57	13.33			
BURLINGTN	-11.05	-5.37	0.26	2.27	1.97
BUSBY	20.31				
CADSWEP	18.04	22.97	20.32	21.73	20.42
CAM	-38.86	-7.65	-0.35	-0.90	0.41
CAPITAL	14.60	19.02	11.65	13.35	12.98
CAPSTAR	1.30	9.95	12.27	20.97	10.28
CAPTALL	32.34	5.56	4.21	56.08	18.90
CARE	-41.40	-148.39	10.06	15.47	10.30
CARGO	9.20	5.70	8.21	11.68	11.09
CARSON	27.21	17.85			
CASHBIL	13.54	12.53	2.55	20.18	30.32
CAXTON	-10.63	15.06	25.85	15.89	14.27
CBD-FUND	18.40	16.67	16.25	14.99	14.45
CCHOLD	17.68				
CEDAGRO	26.89				
CEMENCO	-18.35	-23.32	2.94	4.65	-2.46
CENMAG	18.01	18.31	17.66	3.75	-4.38
CENPROP	20.09	17.12	16.52	19.40	15.81
CERAMIC	19.70	16.76	13.72	15.49	10.40
CFC	9.79	9.06	14.51	5.54	18.75
CGS-FOOD	19.33	21.60	21.20	16.32	10.02
CGSMITH	18.97	21.43	20.75	18.87	13.05
CHARIOT	21.67	30.21	-17.18	6.69	
CHEMSERVE	28.84	35.60	25.42	25.05	20.81
CHESTER	13.06	37.11			

FINANCIAL PERFORMANCE DATA – ROC (CONTINUED)

COMPANY	1998	1997	1996	1995	1994
CHET	10.63				
CHOICE	-141.27	-54.67	3.99	25.41	32.52
CITYHLD		-38.49	-10.30	42.72	18.53
CITYLDG	11.96	12.93	14.86	12.76	9.92
CLINICS	9.70	2.01	5.20	5.51	6.36
CLYDE	5.30	6.25	4.12	11.04	18.69
CMH	21.36	18.83	38.20	45.65	23.08
COASTAL	5.63	10.15	-7.53		
COATES	13.25	47.52	16.92	19.32	17.82
COMAIR	32.08				
COMPAREX	128.45	21.74	23.54	55.85	
COMPASS	12.33	-27.93	0.27	0.74	0.26
CONAFEX	0.75	-1.10	4.16	2.15	11.54
CONCOR	19.42	18.46	22.83	25.27	22.47
CONFED	15.82	21.09	51.24	19.94	21.44
CONFRAM	6.69	5.55	7.90	8.90	7.57
CON-MURCH	-56.42	-134.85	77.88	159.95	101.31
CONNECT	28.61				
CONSHU	6.89	2.16	16.83	18.16	12.43
CONTROL	9.70	11.10	30.43	35.94	16.70
COPI	8.07	4.71	7.37	11.54	12.54
CORNICK	-16.45	4.99	9.71	9.86	7.78
COROHLD	7.68	6.58	12.75	24.44	35.41
CORPCAP	49.87	5.49	7.44	22.51	8.87
CORPCOM	18.02				
CORPGRO	16.73	40.53	B	B	B
CORWIL	0.85	6.07	5.78	6.69	3.14
CROOKES	18.63	10.41	21.31	11.08	4.62
CTP	26.57	22.49	22.80	19.29	16.24
CULLINAN	21.73	-112.59	-2.18	-18.33	-26.66
CULTEL	9.68	22.43	31.61	33.29	35.07
CUSAF	11.71	8.92	14.70	11.52	12.34
DAEWOO	-228.72	-102.32	9.00	15.79	2.32
DALYS	1.47	25.36	21.00	23.94	19.73
DATATEC	30.39	16.56	11.67	16.21	
DEBEERS	8.40	8.84	13.97	10.65	8.46
DECHOLD	27.80	39.06	86.95	74.33	43.37

FINANCIAL PERFORMANCE DATA – ROC (CONTINUED)

COMPANY	1998	1997	1996	1995	1994
DELCORP	19.17	13.47	16.76	17.35	26.31
DELFOOD	19.17	21.61	17.64	17.29	26.57
DELHOLD	19.17	12.04	16.37	17.35	26.31
DELTA	31.94	29.88	32.20	24.45	24.93
DIDATA	47.20	40.07	35.91	40.38	23.65
DISTIL	17.92	19.68	17.50	15.00	12.65
DON	-46.35	-9.18	8.37	-3.92	
DORBYL	15.14	14.99	15.28		-2.28
DUIKERS	65.12	424.92	368.70	252.02	72.96
DUNLOP	5.54	2.55	17.58	14.77	16.24
EDGARS	11.22	17.84	20.29	20.99	23.15
ED-LBATE	16.73	10.90	3.68	42.92	26.44
EDUCOR	20.55	39.36	49.36		
ELEXIR	12.98				
ELLERINE	16.12	20.30	18.83	18.88	23.36
EMPOWER	5.91				
ENERGY	-13.43	7.26	46.75		
ENSERV	5.37		24.14		
ESIC	2.22		-4.38	-0.05	
ETINGTN	5.34	13.33	51.83	6.42	4.08
EUREKA	28.33	6.89	10.66	33.31	27.26
FALCON	-53.69	20.02	103.41	138.66	199.81
FASHAF	15.91	19.21	14.60	15.40	8.37
FBCFID		12.21	11.20	9.86	18.87
FEDICS	30.20				
FEDSURE	1.73	1.67	0.93	0.92	0.88
FELTEX	2.63	16.66	14.94	15.52	
FINTECH	17.30	24.90	34.26	36.22	31.12
FIRSTRAND	1.59	0.84	0.73	1.28	0.64
FIT	2.45	2.70	3.04	3.12	3.02
FMCOTEC	-103.54	-36.54	-18.60	-10.83	19.65
FORBES	-29.93	29.65	26.33		
FORIM	40.41	45.46	19.18	6.94	6.34
FORTUNE	14.75	22.60	24.41	23.77	
FOSCHINI	14.36	12.62	19.71	20.60	20.66
FRALEX	14.74	41.90	23.77	25.64	17.16
FRAME	6.58	5.39	7.63	8.56	7.25

FINANCIAL PERFORMANCE DATA – ROC (CONTINUED)

COMPANY	1998	1997	1996	1995	1994
FRANSAF	-5.08	30.62	17.59	27.36	17.45
FREDDEV	1.71	31.48	2.93	5.04	-18.95
FRIDGEM	-42.84	18.42	17.94		
G5HOLD	15.36	8.56	9.82	13.45	1.71
GARDIAN	7.59	7.02	6.79	8.52	6.34
GEM	B	B	B	B	B
GENBEL	8.38	6.62	-9.53	31.30	18.03
GENCOR	2.54	24.83	23.83	7.12	4.96
GEN-OPTIC	12.86	11.82	8.46	3.98	7.18
GENSEC	14.70	11.06	8.74		
GFSA	25.93	2.68	15.86	17.63	-9.09
GILBOA			B		
GLENMIB	2.29				
GLODINA	-9.59	6.52	1.99	14.82	14.85
GLOHOLD	-92.46	11.89	27.62	21.34	
GLOPVT	14.91	13.37	15.12	14.43	22.33
GOLDSTEIN	0.00	15.21	22.48	5.87	1.27
GRAYPROP	18.02	17.46	16.57	15.26	14.20
GRINAKER	19.92	15.88			
GRINCOR	4.40	7.75	15.74	9.53	11.57
GRINTEK	20.59	12.74	51.78	26.72	27.01
GROPROP	28.04	26.90	20.82	20.38	19.33
GROUP-5	15.37	8.56	9.83	13.45	1.72
GROWPNT	-0.34	0.24	0.36	0.79	-0.01
GUBINGS	-4.46	3.73	-15.66	10.94	8.96
GUNDLE	2.06	14.43	20.92	17.58	4.68
HARVEST	20.04	12.23	17.44	19.28	13.99
HARWILL	-27.39	-6.52	12.42	13.03	11.83
HCI	1.25	5.18	60.56	26.56	-137.50
HEAVEN	38.71	32.40			
HICORL	8.75	8.76		14.86	16.52
HIVELD	8.85	3.58	2.58	10.45	7.51
HLH	0.31	4.27	0.02	0.50	7.83
HOMECHOIC	28.61	28.17	20.21		
HOWDEN	15.31	26.17	35.76		
HUDACO	17.76	24.44	24.88	24.49	21.84
HYPROP	0.75	0.02	0.25	0.03	0.03

FINANCIAL PERFORMANCE DATA – ROC (CONTINUED)

COMPANY	1998	1997	1996	1995	1994
I-&-J	12.03	12.29	6.42	10.36	10.90
ICH	54.29	47.94	17.54	4.78	6.28
IHTECH	73.84	-231.13			
ILIAD	21.97				
ILLOVO	30.33	26.21	15.77	12.17	8.94
IMPERIAL	11.67	11.93	12.31	13.87	14.46
IMPHOLD	4.50		0.00	0.00	18.50
IMPLATS	53.79	20.36	16.26	26.08	13.67
INDNEWS		45.24	33.39	33.90	17.12
INFINITI	59.00				
INHOLD	6.45	10.88	7.23	6.79	6.69
INMINS	17.94	56.78	9.11	8.50	8.53
INTRUST	1.26	1.90	2.13	2.45	1.43
INVICTA	30.56	48.07	56.87	32.90	
INVSTEC	10.03	10.74	8.02	7.59	6.67
IOTA	0.01	7.75	3.11	-2.11	5.71
ISCOR	9.28	-9.74	9.74	9.54	6.28
ITI-TECH	25.19				
ITLTILE	20.93	20.58	18.91	12.15	10.61
IXCHANGE	14.19				
JASCO	40.03	30.40	29.80	31.15	25.73
JDGROUP	15.74	10.84	15.63	15.82	26.99
JOHNNIC	17.51	12.97	5.50	15.60	27.06
KAIROS		2.06	-66.72	-51.35	-50.73
KAROS	-28.16	4.86	3.15	2.36	-0.56
KELGRAN	4.37	17.41	16.16	9.60	17.89
KERSAF	28.39	13.36	15.01	17.12	16.27
KGMEDIA	5.12	16.19	17.71	26.60	12.29
KH-PROPS	2.21	0.02	0.10	0.00	0.09
KING	35.16	29.43			
KOLOSUS	-14.62	-17.72	0.39	10.20	
KTL	10.39	10.29	40.92	23.49	28.22
KWV-BEL	7.91	7.62	7.62	6.09	3.67
LANGEBERG	9.68	11.46	17.87	14.17	15.60
LASER	15.90	7.21	-13.64	-0.08	7.08
LA-STORE	85.12	138.93	163.92	-23.69	-27.17
LEFIC	0.00	0.00	0.00	0.02	0.01

FINANCIAL PERFORMANCE DATA – ROC (CONTINUED)

COMPANY	1998	1997	1996	1995	1994
LENCO	8.58	10.38	-5.13	15.28	21.39
LESRNET	14.60	27.11	20.39	28.82	18.88
LIBERTY	1.33	3.27	1.77	2.98	0.81
LIB-HOLD	1.46	3.33	1.85	2.30	0.46
LIBSIL	2.63	2.52	2.19	2.04	2.13
LIBVEST	2.99	2.34	0.01	0.00	1.58
LIFESTYLE	34.23	14.22			
LIONMATCH	13.51	14.00	13.03	9.97	50.05
LOGTEK	27.69	12.04	35.85	21.77	13.60
LONFIN	0.38	3.24	7.09	2.76	46.14
LONMIN PL	11.16	15.93	2.57	7.31	5.69
L-T-A	15.67	24.40	23.83	18.77	18.33
LUSEA	-61.88	85.17	-174.13		-45.72
M-&-F	7.59	6.44	6.04	5.52	5.17
M&R-HLD	16.75	-2.20	13.69	13.44	10.90
MACADAM	12.96	28.20	36.91	34.47	20.11
MACMED	17.51	29.19	17.87	15.36	22.30
MALBAK	8.44	6.00	15.48	15.24	12.63
MARANDA	107.40	76.81	54.36	26.24	
MARCONS	4.19	4.47	16.36	15.37	14.31
MARLIN	8.74	15.79	6.49	-4.86	-15.61
MARTPROP	2.31	12.01	12.45		
MASONITE	6.11	11.44	12.12	13.73	10.22
MATHOMO	-74.56	31.95	29.56		
MAWENZI	8.12	9.91	12.00	10.95	16.33
MAXTYRE	21.71				
MBTECH	B				
M-CELL	20.99	9.99	0.52		
M-C-M	B	B	B	B	B
MCRTAIL	-33.59	16.32	24.28	29.17	22.85
MDMGRO	6.62	13.06	22.62	21.20	33.23
MEDCLIN	17.86	15.86	18.31	11.47	9.70
MEDEX	-7.49	13.16	5.91	4.97	
MERCANTIL	1.56				
MESSINA	-4.11	5.77	7.47	8.42	4.48
METAIR	11.54	21.71	15.25	18.21	14.85
METCASH	26.15	26.46	22.15	28.89	31.22

FINANCIAL PERFORMANCE DATA – ROC (CONTINUED)

COMPANY	1998	1997	1996	1995	1994
METJE-&-Z	4.03	6.50	-14.94	10.20	7.45
METKOR	12.38	17.11	13.84		-2.07
METLIFE	-5.92	4.28	1.58	1.39	1.11
MGX	24.72	27.76	88.48		
MICIND	16.17	77.91	36.36	29.74	16.86
MIDAS	21.16	19.39	20.03	22.81	11.50
MIH/M-WEB	0.68	260.71	-15.71	57.64	
MILPROP	0.32	-1.01	-1.19		
MINGRAN	-24.65	-5.63	-6.78	-37.37	-10.57
MINORCO	5.47	9.24	9.26	11.56	7.73
MLNHOLD	8.80	15.85	6.54	-5.05	-17.92
MMWTECH	8.68				
M-NET/SS	B	119.82	47.39	64.31	71.37
MOBILE	4.44	5.32	6.37	5.47	4.25
MOLOPE	60.44				
MONEX	12.33	13.94	-9.50	-27.01	4.91
MORIBO	8.71	-26.52	21.82	88.28	-15.11
MOULDMED	151.77				
MSAULI	20.99	4.23	-0.64	21.17	29.11
MT-EAGLE	0.17	-1.25	4.49	2.48	11.87
MUSTEK	49.71	38.85			
NAIL	7.27	8.32	17.66	6.81	4.10
NAMFISH	76.53	-26.80	-23.53	5.52	17.18
NAMPAK	18.84	20.39	22.72	23.78	21.12
NAMSEA	-8.02	-0.73	-11.22	25.86	18.89
NANDOS	46.16	87.46			
NASPERS	9.05	16.79	32.21	29.62	19.92
NATCHIX	17.44	14.04	16.94		
NEDCOR	10.14	11.33	11.72	10.49	9.40
NEI-AFR	12.69	8.18	20.23	14.82	8.16
NEIHOLD	12.60	8.07	20.03	14.81	8.16
NETCARE	9.50	3.21			
NEW-MIN	-187.08	B	B	B	B
NEWPORT	12.60	13.44	12.03	11.33	11.47
NEW-WITS	16.39	2.94	14.46	16.39	-6.78
NICTUS	-29.74	-0.29	6.41	10.55	17.20
NINIAN	2.58	11.26	10.85	12.17	13.28

FINANCIAL PERFORMANCE DATA – ROC (CONTINUED)

COMPANY	1998	1997	1996	1995	1994
NORTHAM	25.04	-22.27	-9.02	-678.46	B
NORVEST	0.00	-0.27	0.18		
NUCLICKS	17.25	16.60	18.97	16.44	10.12
NUWORLD	14.21	17.59	16.08	16.43	13.18
OAKFLDS	-9.32	-18.43	-16.88	-41.92	-73.58
OCFISH	39.12	42.21	32.83	35.65	26.17
OCTODEC	0.27	0.40	0.98	2.86	0.28
ODMHOLD	29.61	27.35	18.13	6.07	32.33
OHAGANS	43.33				
OMEGA	-39.38	24.34	36.99	-64.05	
OMNIA	18.42	26.27	25.89	19.85	21.61
OMNICOR	8.06	21.65	14.64	13.49	22.02
OTK	12.04	9.95			
OTR	-71.24				
OUTSORS	261.25	80.94			
OVBEL	-7.77	-14.93	-2.47	5.47	-4.71
OZZ	13.55	14.97	12.11	25.10	11.34
PACIFIC	-4.34	2.63	-41.03	10.96	5.63
PALAMIN	133.46	216.66	716.50	2719.73	318.61
PALS	3.42	5.72	24.84	30.31	21.38
PANPROP	-0.23	1.48	0.43	0.67	0.83
PARADIGM	39.98				
PARAGON	25.14				
PARAMED	93.14				
PENROSE	42.23	17.97			
PEPGRO	12.43	15.89	5.88	9.49	9.90
PEPKOR	16.36	20.85	11.09	17.99	16.93
PERSBEL	-10.53	12.73	2.61	2.60	2.13
PETMIN	64.61	348.04	88.48	46.49	64.75
PICKNPAY	26.03	28.03	22.53	18.49	25.02
PIKWIK	103.47	162.81	132.13	101.20	119.68
PIONEER	15.68	12.99	11.52	12.66	13.67
PLATE-GL	11.73	30.91	33.92	27.12	28.96
POLIFIN	29.16	34.21	33.25	23.39	
PORTHLD	14.62	15.73	18.96	22.57	19.95
POWTECH	19.90	13.31	8.43	13.96	18.64
PPC	17.42	17.11	18.59	20.20	17.20

FINANCIAL PERFORMANCE DATA – ROC (CONTINUED)

COMPANY	1998	1997	1996	1995	1994
PREM-GRP	15.97	14.81	32.35	8.35	16.96
PREMIUM	1.10	0.33	0.10	0.09	
PRESMED	10.07	16.81	16.51	15.42	16.11
PRESTAS	-1.45	33.87	56.91	72.92	
PRIMA	14.85	15.28	13.27	12.71	9.69
PRIMATOY	16.56				
PRIME	60.18	25.04	11.09	6.48	-0.85
PROFURN	26.80	34.34	25.84	16.59	22.20
PROPFIN	-6.78	-2.55	-8.69	-4.21	-0.15
PROSPUR	6.73				
PSG	65.47	7.71	81.32	82.78	-100.44
PSL	21.21	26.06	10.17	23.65	17.69
PUTCO	9.65	1.09	5.84	8.52	15.86
PUTPROP	7.19	7.33	6.65	6.32	4.83
RAD	6.90				
RADIOSPR	43.56				
RAG	14.48	10.65			
RA-HOLD	10.62	5.57	2.71	4.78	
RAI	10.60	5.56	2.68	3.51	
RAINBOW	-28.42	-21.93	-23.45	3.43	0.64
RANGOLD	-31.08	18.32		46.11	7.11
RARECO	-25.34	-113.04	-12.19		-1.32
REBHOLD	38.25	25.16			
REFCORP	14.91				
RELYANT	1.48	5.93	5.94	4.40	1.18
REMBR-BEH	8.23	9.35	9.04	9.64	12.31
REMGRO	8.23	9.34	9.19	9.66	12.31
RENAISAN	21.25				
RENTSUR	7.49	16.15	8.61	7.73	1.03
RETCORP	31.83	34.04	30.43	26.96	-41.35
REUNERT	23.55	4.51	18.38	25.25	29.70
REX-TRUE	11.46	9.06	9.08	9.75	10.16
RICHEMONT	24.91	32.79	57.37	21.84	9.72
RICHWAY	0.25	0.23	0.23	0.21	
RLSPROPS	2.01	10.56	4.51	21.06	9.09
RMBH	3.01	4.36	0.88	0.64	0.75
RMP-PROP	7.42	24.60	10.80	17.56	7.20

FINANCIAL PERFORMANCE DATA – ROC (CONTINUED)

COMPANY	1998	1997	1996	1995	1994
RMSPROP	0.72	0.14	0.11	-1.98	0.05
ROADCOR	19.17	8.77	12.12	10.92	12.02
ROMATEX	2.12	-13.82	0.36	7.86	11.97
S&JLAND	-0.46	-0.11	-1.02		
S&SHOLD	-10.98	8.94	11.85	11.75	13.87
SAAMBOU	16.09	14.76	17.20	16.49	21.78
SAB	11.65	20.43	19.55	16.38	13.42
SABLE	-36.12	9.94	12.29	11.53	13.95
SABVEST	4.68	3.02	28.03	2.75	4.17
SA-DRUG	15.19	19.76	13.11	13.83	13.51
SA-EAGLE	9.35	17.21	8.78	13.58	0.35
SAFREN	6.54	10.91	14.07	14.19	13.15
SAGEGRP	2.93	2.67	3.65	2.70	3.07
SAIL	6.04				
SAMRAND		0.96	0.68	-15.11	7.42
SAMROC	-16.67	-30.21	-125.20	-448.26	
SANLAM	0.24				
SANTAM	10.75	10.77	11.05	12.60	9.95
SAPPI	7.82	2.22	3.09	7.32	0.54
SASANI	41.89	50.45	58.17	81.39	-121.23
SASFIN	15.60	17.53	27.32	25.22	19.94
SASOL	17.09	22.54	21.56	18.45	16.28
SAVANHA	-12.24				
SBIC	13.19	11.35	10.21	9.08	9.94
SCHAMIN	6.29		5.91	9.89	23.55
SCHARIG	9.82		13.01	17.80	31.26
SEAHARV	23.04	22.83	25.11	22.97	19.97
SEARDEL	9.08	4.13	12.43	15.61	10.90
SEARTEC	14.47	14.59	18.63	15.39	
SENTRY	91.18	24.43	24.25	-8.60	3.45
SERVEST	6.05	16.21	17.89	27.33	12.62
SETHOLD	49.85				
SFG		-67.20	-71.67	-6.26	-25.99
SFTLINE	49.71	28.23			
SFW	12.01	15.59	14.62	9.51	6.83
SHARIND	17.91		26.42	23.70	18.45
SHOPRIT	32.45	28.59	14.65	23.48	14.34

FINANCIAL PERFORMANCE DATA – ROC (CONTINUED)

COMPANY	1998	1997	1996	1995	1994
SIB	-7.39	6.46	3.33	2.99	1.73
SILTEK	24.48	16.26	65.81	29.66	26.73
SISA	17.40	15.64	16.57	14.73	14.56
SMC	-186.55				
SONDOR	20.61	18.93	28.91	22.28	-9.91
SOVFOOD	16.43	7.11	20.48		
SOWITS	22.41	-13.63	-54.49	69.43	-7.21
SPANJAARD	34.13	27.45	19.63	4.40	7.18
SPECLTY	15.90	13.38	20.41	16.86	16.49
SPESCOM	26.68	-17.50	17.31	11.24	3.97
SPICER		-46.37	-10.75	-5.29	23.13
SPUR	56.81	74.49	97.58	145.54	267.60
SPURHLD	62.66	95.35	113.10	201.41	458.16
STANTRN	63.09	-119.85	-60.52	-16.28	6.31
STEERS	51.46	71.76	82.12	38.72	
STOCHOT	6.80	4.66			
STOCKS	-11.63	9.47	10.17	11.74	13.86
STORECO	17.14	12.24	18.24	21.75	19.89
STRAND	7.26	-2.44	-22.01	3.75	-91.63
SUPRGRP	14.79	22.26	25.82	21.44	13.84
SYCOM	12.94	11.82	10.76	10.29	10.79
TEGKOR	8.26	9.29	8.95	9.63	12.27
TELJOY	27.94	17.36	-71.80	-24.03	18.50
TELTRON	14.41	14.01	15.82		
TEMPORA	5.66	5.10	5.25	4.89	4.95
TEREXKO	48.41	8.94			
THABEX	-146.00	B	B	B	-275.00
THEBE	2.31	3.94	2.06	10.84	9.44
THETA	18.69	3.86	0.68	26.34	
TIB	8.23	9.28	8.94	9.63	12.29
TIGON	34.38	56.78	54.62		
TIGR-OATS	19.12	20.05	22.86	17.96	11.74
TIWHEEL	15.93	19.78	18.65	27.32	31.86
TMX	-7.01	-4.26	5.17	18.26	16.30
TOCO	-778.50	-404.77	10.04	12.60	12.27
TOLARAM	-26.57	-19.35	-11.77	13.84	13.34
TONGAAT	16.33	17.06	22.82	12.85	6.56

FINANCIAL PERFORMANCE DATA – ROC (CONTINUED)

COMPANY	1998	1997	1996	1995	1994
TOURVST	50.22	53.88			
TOYOTA	5.38	4.99	8.42	11.16	6.01
TREMATON	5.19				
TRENCOR	15.31	14.46	24.35	8.12	6.21
TRIDELTA	7.37				
TRNPACO	30.57	14.02	12.42	7.35	-5.46
TRNSHEX	75.46	92.04	80.51	4.23	78.93
TRUWTHS	22.69				
TWEEFONTN	182.92	341.24	342.58	180.93	234.78
UCS	14.42				
UMBONO	3.16	-34.32	5.41		
UNIGRO	19.44	9.68	8.81	7.14	4.03
UNIHOLD	18.19		20.46	30.64	25.05
UNISERV	2.73	3.24	11.61	33.68	33.00
UNISPIN	-29.14	-18.05	0.72	13.78	9.95
UNITRAN	14.59	10.94	13.19	14.37	15.75
USKO	45.17	78.61	56.11	46.28	24.15
VALAUTO	5.27	6.01	7.94	9.49	9.73
VALCAR	5.39	6.10	8.10	9.94	10.23
VENTEL	8.57	3.81	-9.08	6.13	12.96
VENTRON	21.00	16.02	7.74	16.84	15.56
VESTCOR	7.52		-75.25		5.37
VIKING	128.18				
VOGELS	20.60	24.50	25.40	33.12	-8.37
VOLTEX	107.35	13.71	13.82	12.80	5.47
WACO	19.49	10.39	12.86	-12.03	5.40
WANKIE	5.95	9.12	9.41	7.81	16.53
WBHO	31.36	25.87	27.44	11.65	17.65
WBHOLD	-4.45	-13.00	13.92	5.52	13.53
WESCAPE	12.40	17.51	1.72	-6.08	-302.49
WESCO	5.45	5.34	8.83	8.93	5.16
WETHLYS	15.64				
WINBEL	8.85	50.00	14.19	11.93	7.91
WINHOLD	8.67	49.30	13.98	11.74	7.78
WIT-G-M	3.16	145.08	8.95	-1.39	6.86
WOOLIES	35.01	19.45			
WOOLTRU	33.40	17.21	22.93	28.77	24.42

FINANCIAL PERFORMANCE DATA – ROC (CONTINUED)

COMPANY	1998	1997	1996	1995	1994
W-R-CONS	40.48	40.96	13.04	0.75	3.09
YABENG	-4.10	-2.15	2.67	49.82	16.87
YORKCOR	2.93	6.94	-11.51	14.38	6.92
YTHRK	25.99				
Z-C-I	-14.66	-1.08	-29.72	-39.21	-3.03
ZELTIS	11.65	2.51	-1.11		-2.93
ZENITH	B	B	-1522.64		

APPENDIX 4.2

FINANCIAL PERFORMANCE DATA – ROA

COMPANY	1998	1997	1996	1995	1994
ABACUS	12.67	19.35			
ABI	23.32	19.54	17.73	21.78	21.28
ABRAXAS	18.12				
ABSA	13.26	13.41	12.44	9.93	9.95
ACREM	9.46	8.29	10.61	8.87	11.12
ADCOCK	40.98	34.33	25.13	30.53	30.20
ADCORP	30.90	31.81	29.69	17.31	13.56
ADMIRAL	-25.08	-5.49	2.70		
ADONIS	10.63	14.00	12.95	17.73	6.38
ADVED	22.52	9.68			
ADVSOURCE	60.96	46.44	10.39	8.65	19.07
ADVTECH	32.92	18.41	15.17	2.85	3.48
AECI	10.75	11.55	13.39	11.99	10.78
AF-&-OVER	13.84	12.55	12.82	12.33	9.89
AFBRAND	16.08				
AF-HARV	11.49	0.00			
AFLIFE	7.70	4.59	4.07	5.12	5.41
AFROX	19.48	19.43	19.65	18.44	17.66
AIDA	27.21	-10.15	-3.02	6.27	4.15
ALEXNDR	18.01	12.87	14.13	15.77	15.98
ALEXWYT	-0.96	7.18	6.08	7.05	3.36
ALIANCE	22.04	20.44			
ALTECH	19.91	17.07	12.21	15.65	15.47
ALTRON	18.27	16.14	13.25	16.40	15.52
ALUDIE	40.52	8.52	12.04	13.50	
AMAPROP	7.43	6.01	6.35	5.08	5.41
AMAPS	9.41	15.94			
AMB	4.21				
AME	54.38	16.41	38.22	-54.99	77.72
AMGOLD	17.24	22.99	19.44	27.80	29.99
AMLAC	-1.11	18.81	26.47		
AMMGROUP	17.31				
AMPLATS	54.95	38.85	58.20	69.81	60.08
ANAMINT	7.22	9.20	7.86	7.55	7.81
ANBEECO	18.22	9.33	19.81	14.85	10.16
ANGLO-AM	13.54	12.41	12.79	11.36	11.16

FINANCIAL PERFORMANCE DATA – ROA (CONTINUED)

COMPANY	1998	1997	1996	1995	1994
APEX	13.56	11.34	11.14	12.47	9.76
APLITEC	6.92				
AQUILA	-0.31	2.54			
ARIES	17.64	18.72	27.39	31.20	32.58
AROMA	-1.22	7.01	11.25	10.73	8.77
ASPEN	-2.39	-7.71	18.61	40.77	19.06
ASS-MANG	30.42	24.50	40.78	24.60	27.75
ASSORE	8.30	8.73	9.92	10.55	8.49
ASTRAPAK	20.02				
ATLAS	10.20	9.19	9.64	10.48	7.23
AUTOPGE	10.11	11.07	11.23	4.63	24.75
AUTOQIP	18.04	17.89	16.73	16.38	15.03
A-V-I	9.10	12.03	13.40	16.35	15.61
AVIS	21.46	20.56	17.67		
AVMIN	12.09	14.38	13.23	14.39	14.01
AWETHU	26.30				
BARLOWS	13.64	12.97	12.94	11.95	5.56
BARNEX	-111.18	-48.34	3.82	4.20	2.11
BARPLAT	-11.54	4.34	3.27	-1.55	-2.54
BARPROP	7.06				
BASREAD	17.21	13.19	6.14	-7.11	-14.00
BATECOR	7.86	4.57	0.25	9.89	
BATEPRO	6.35	5.88	11.40	15.69	7.94
BATSA	36.83	16.88	11.99	5.61	9.15
BEARMAN	16.23	21.33	24.17	25.77	22.61
BEIGE	20.27				
BELL	0.49	10.89	13.56	10.44	
BENCO	-2.10	16.27	10.23	-4.33	-2.33
BEVCON	8.17	8.01	8.36	7.39	6.19
BICAF	13.40	4.65	-1.55	9.15	28.75
BIDVEST	16.21	14.53	18.59	19.10	18.14
BILLCAD		18.39			
BILLITON	11.69				
BIVEC	4.81	5.38	3.62	3.18	2.88
BJM	6.42				
BOE	26.46	11.92	11.32	11.58	9.45
BOECORP	3.02	4.43	6.52	5.62	5.68
BOLTONS	9.51	7.42	8.97	11.44	9.00

FINANCIAL PERFORMANCE DATA – ROA (CONTINUED)

COMPANY	1998	1997	1996	1995	1994
BOLWEAR	10.60	6.75	10.04	13.50	10.66
BONATLA	8.60				
BOTREST	-56.49	-7.72	29.13	-12.64	17.64
BOUMAT	-2.35	7.21	6.61	12.32	5.52
BOWCALF	28.96	29.32	26.51	28.47	33.60
BRAIT	30.08	2.53	3.88	3.10	2.34
BRANDCO	21.89	19.20	232.66	246.23	166.09
BRIMSTON	2.68				
BRNWARE	26.35				
BUILDMAX	-1.20	13.13			
BURLINGTN	-1.95	7.52	10.70	8.69	7.13
BUSBY	18.60				
CADSWEP	19.49	19.39	19.55	19.34	19.18
CAM	0.91	8.64	9.12	8.81	9.84
CAPITAL	14.50	16.62	13.76	12.07	12.18
CAPSTAR	2.12	15.33	16.69	22.81	12.15
CAPTALL	5.78	2.94	3.16	-5.99	4.97
CARE	-24.10	7.76	0.55	17.47	14.39
CARGO	8.82	8.13	8.19	9.65	8.48
CARSON	24.49	15.63			
CASHBIL	8.79	8.84	4.05	12.46	16.13
CAXTON	-0.40	14.95	15.75	13.99	13.52
CBD-FUND	16.71	15.89	14.83	13.60	12.71
CCHOLD	18.52				
CEDAGRO	22.42				
CEMENCO	-3.95	-3.37	7.31	6.94	3.24
CENMAG	22.99	20.89	19.33	10.91	12.10
CENPROP	18.26	15.71	15.53	15.00	14.71
CERAMIC	16.93	15.12	14.52	13.29	9.72
CFC	9.43	10.21	9.91	8.49	8.17
CGS-FOOD	19.84	17.60	17.22	16.28	12.99
CGSMITH	19.27	18.37	18.19	18.10	14.99
CHARIOT	14.39	22.20	7.61	7.33	
CHEMSERVE	22.82	21.25	21.38	20.88	18.93
CHESTER	6.59	2.89			
CHET	13.32				
CHOICE	-34.33	-16.26	2.86	15.96	12.23
CITYHLD		0.82	9.57	29.17	17.67

FINANCIAL PERFORMANCE DATA – ROA (CONTINUED)

COMPANY	1998	1997	1996	1995	1994
CITYLDG	18.13	20.16	24.62	23.49	20.29
CLINICS	16.40	9.93	16.06	15.15	15.66
CLYDE	6.07	7.49	7.26	8.34	11.26
CMH	18.58	18.73	25.63	27.84	16.05
COASTAL	2.61	14.38	-7.63		
COATES	14.00	12.84	16.86	17.81	17.74
COMAIR	33.79				
COMPAREX	35.09	15.48	16.90	23.31	
COMPASS	12.32	12.05	10.36	9.73	9.38
CONAFEX	1.90	2.12	5.43	3.77	7.79
CONCOR	11.80	11.34	11.04	11.71	12.15
CONFED	21.92	23.54	23.91	27.11	29.25
CONFRAM	8.06	4.29	8.09	9.95	4.22
CON-MURCH	-5.84	-69.41	60.13	120.44	64.64
CONNECT	16.72				
CONSHU	10.24	5.77	18.88	18.76	17.25
CONTROL	2.53	12.41	20.39	19.62	12.05
COPI	2.73	4.23	5.37	6.82	6.63
CORNICK	0.66	5.36	10.19	11.27	12.08
COROHLD	6.99	8.93	16.84	14.06	9.02
CORPCAP	-0.14	9.00	10.76	21.14	14.94
CORPCOM	17.44				
CORPGRO	16.67	30.03	39.27	90.09	134.72
CORWIL	1.42	5.91	5.65	6.53	3.14
CROOKES	11.58	13.49	12.06	11.92	5.40
CTP	25.24	21.67	23.44	19.03	19.16
CULLINAN	9.23	-9.09	1.39	-9.79	-4.63
CULTEL	9.34	20.88	17.58	22.41	18.88
CUSAF	9.37	9.62	10.05	9.46	4.09
DAEWOO	-31.86	-16.09	16.86	14.06	7.48
DALYS	1.48	7.38	19.30	20.71	17.57
DATATEC	14.69	13.55	20.35	18.68	
DEBEERS	8.31	10.30	11.58	11.77	7.71
DECHOLD	31.07	35.26	46.28	37.76	24.64
DELCORP	15.33	6.80	13.24	11.30	14.97
DELFOOD	15.34	10.32	13.68	11.38	15.50
DELHOLD	15.33	6.84	13.08	11.30	14.97
DELTA	31.88	29.45	24.62	24.84	23.27

FINANCIAL PERFORMANCE DATA – ROA (CONTINUED)

COMPANY	1998	1997	1996	1995	1994
DIDATA	27.66	29.38	25.75	28.51	25.42
DISTIL	21.12	20.76	20.51	18.96	19.92
DON	-9.24	0.01	11.30	5.89	
DORBYL	12.47	10.23	12.54		5.72
DUIKERS	48.40	78.16	86.69	69.32	49.27
DUNLOP	8.38	6.21	12.96	20.21	19.76
EDGARS	12.29	18.25	21.88	23.00	24.66
ED-LBATE	8.41	5.46	5.42	7.27	10.25
EDUCOR	20.38	35.67	35.51		
ELEXIR	12.91				
ELLERINE	20.49	24.25	23.84	20.56	21.21
EMPOWER	5.84				
ENERGY	6.18	10.29	5.90		
ENSERV	13.67		23.89		
ESIC	6.17		1.99	1.92	
ETINGTN	3.97	4.43	8.51	6.80	5.11
EUREKA	3.18	2.37	5.68	19.77	12.62
FALCON	-40.93	10.13	57.36	75.24	104.88
FASHAF	16.13	15.31	16.57	13.10	9.34
FBCFID		15.32	15.37	13.35	14.23
FEDICS	28.83				
FEDSURE	1.84	1.78	1.43	1.27	0.85
FELTEX	11.14	15.71	13.89	16.28	
FINTECH	18.63	21.68	19.43	20.46	18.20
FIRSTRAND	3.57	1.24	0.93	1.55	1.10
FIT	4.55	4.66	5.26	5.88	5.72
FMCOTEC	-11.24	-1.56	-4.10	0.72	11.57
FORBES	19.43	17.98	13.61		
FORIM	18.49	20.87	14.08	9.29	9.36
FORTUNE	18.84	27.56	31.79	28.91	
FOSCHINI	18.37	17.26	25.95	26.85	26.27
FRALEX	18.01	12.89	14.09	15.76	15.97
FRAME	7.97	4.24	8.00	9.85	4.19
FRANSAF	0.10	20.12	15.50	29.14	15.94
FREDDEV	1.67	6.07	3.88	4.34	18.20
FRIDGEM	-15.84	14.08	18.99		
G5HOLD	8.39	4.94	5.43	5.95	6.01
GARDIAN	0.08	4.53	4.78	5.95	3.47

FINANCIAL PERFORMANCE DATA – ROA (CONTINUED)

COMPANY	1998	1997	1996	1995	1994
GEM	-225.82	-36.02	-36.97	-55.59	-12.79
GENBEL	0.57	-0.29	3.95	4.22	4.61
GENCOR	1.65	17.48	18.92	6.70	6.08
GEN-OPTIC	13.85	14.44	13.59	9.01	11.46
GENSEC	11.27	12.04	11.34		
GFSA	6.76	15.47	13.82	17.01	14.88
GILBOA			-15.82		
GLENMIB	10.72				
GLODINA	0.00	8.36	6.01	13.81	12.56
GLOHOLD	1.71	13.05	23.78	19.87	
GLOPVT	20.43	14.69	20.90	19.73	27.71
GOLDSTEIN	0.00	14.84	21.82	5.74	1.25
GRAYPROP	16.39	15.95	15.21	14.09	13.23
GRINAKER	9.03	7.66			
GRINCOR	7.85	8.98	9.11	10.13	7.55
GRINTEK	11.59	10.35	13.70	16.70	17.16
GROPROP	19.10	19.10	18.80	18.48	17.61
GROUP-5	8.40	4.95	5.44	5.95	6.01
GROWPNT	13.41	13.08	11.85	8.83	5.79
GUBINGS	5.68	7.38	4.10	11.23	6.87
GUNDLE	5.84	13.10	15.47	13.17	8.86
HARVEST	6.78	9.03	7.16	8.37	7.99
HARWILL	-15.11	-3.68	12.92	23.44	19.93
HCI	1.67	2.82	-2.62	-0.87	-1.66
HEAVEN	34.85	32.46			
HICORL	10.50	12.33		10.68	12.11
HIVELD	9.44	6.32	3.26	8.25	6.04
HLH	4.79	6.50	7.64	6.88	11.77
HOMECHOIC	26.34	25.08	20.57		
HOWDEN	17.63	23.00	18.94		
HUDACO	16.02	22.00	22.88	19.21	19.17
HYPROP	13.48	12.80	10.46	9.71	8.44
I-&-J	11.71	12.33	9.82	12.32	10.48
ICH	70.16	69.88	17.47	4.77	6.26
IHTECH	48.49	-135.78			
ILIAD	14.83				
ILLOVO	21.92	18.91	15.13	13.87	7.64
IMPERIAL	13.69	11.83	13.03	14.15	15.62

FINANCIAL PERFORMANCE DATA – ROA (CONTINUED)

COMPANY	1998	1997	1996	1995	1994
IMPHOLD	5.69		0.00	0.00	17.14
IMPLATS	42.51	24.75	21.37	32.15	22.10
INDNEWS		30.12	30.42	29.47	18.79
INFINITI	22.41				
INHOLD	0.83	7.45	6.87	10.19	7.86
INMINS	12.35	10.41	7.78	9.11	10.62
INTRUST	1.34	1.98	2.15	2.51	1.46
INVICTA	21.60	25.01	25.30	20.50	
INVSTEC	8.28	7.44	6.93	10.29	7.97
IOTA	0.12	5.12	9.90	3.09	8.76
ISCOR	11.93	6.38	9.43	11.79	8.47
ITI-TECH	20.77				
ITLTILE	20.63	19.18	15.50	12.40	9.84
IXCHANGE	13.65				
JASCO	26.09	19.25	20.58	24.91	23.73
JDGROUP	17.29	16.51	15.94	15.68	17.35
JOHNNIC	17.74	6.23	8.26	11.75	16.49
KAIROS		-5.41	-2.77	-7.03	-9.06
KAROS	2.12	4.39	5.63	5.86	3.14
KELGRAN	7.83	16.71	13.51	10.19	10.87
KERSAF	17.22	16.40	18.23	17.25	16.39
KGMEDIA	7.03	3.64	16.54	21.03	17.02
KH-PROPS	12.89	12.48	11.16	11.59	9.96
KING	25.31	27.62			
KOLOSUS	5.35	5.25	12.38	9.51	
KTL	7.36	8.15	10.93	13.53	12.71
KWV-BEL	7.51	7.25	7.27	6.14	5.53
LANGEBERG	11.49	13.88	18.22	21.49	16.17
LASER	15.56	12.32	6.05	5.93	9.05
LA-STORE	42.70	32.82	4.61	-22.58	-12.73
LEFIC	0.00	0.00	0.00	0.02	0.01
LENCO	11.91	13.26	9.95	14.81	17.20
LESRNET	19.87	22.15	21.49	26.31	19.14
LIBERTY	5.10	1.84	2.91	3.11	1.25
LIB-HOLD	2.93	1.98	2.18	2.67	0.91
LIBSIL	2.74	2.48	2.16	2.02	2.11
LIBVEST	2.95	2.30	0.01	-2.56	0.70
LIFESTYLE	34.02	15.13			

FINANCIAL PERFORMANCE DATA – ROA (CONTINUED)

COMPANY	1998	1997	1996	1995	1994
LIONMATCH	14.81	15.70	15.30	14.31	16.59
LOGTEK	20.17	15.73	21.16	24.64	17.74
LONFIN	0.50	1.49	1.31	2.50	0.18
LONMIN PL	7.00	10.24	12.27	11.06	8.86
L-T-A	10.46	9.79	9.56	10.05	9.30
LUSEA	-12.95	7.45	-10.66		6.09
M-&-F	6.84	6.54	6.26	4.73	4.55
M&R-HLD	8.51	2.32	10.31	12.29	11.32
MACADAM	14.61	30.73	37.68	27.79	14.41
MACMED	18.18	15.66	15.30	13.36	14.03
MALBAK	9.84	5.44	13.95	13.32	12.37
MARANDA	67.91	71.51	50.29	26.37	
MARCONS	7.47	15.25	15.23	14.28	13.38
MARLIN	8.48	15.45	6.94	4.29	9.85
MARTPROP	2.22	11.31	11.73		
MASONITE	7.07	11.32	12.55	17.72	13.85
MATHOMO	12.38	26.67	22.24		
MAWENZI	5.62	14.59	15.59	13.77	11.08
MAXTYRE	18.16				
MBTECH	17.97				
M-CELL	21.66	10.73	-0.14		
M-C-M	-11.48	-13.67	8.85	24.36	16.41
MCRTAIL	14.35	17.79	20.87	26.91	23.91
MDMGRO	3.54	14.29	19.10	19.77	28.44
MEDCLIN	17.58	19.88	22.82	18.57	17.78
MEDEX	3.11	-1.40	7.67	6.21	
MERCANTIL	11.36				
MESSINA	-0.79	6.91	9.32	9.67	5.89
METAIR	13.68	15.48	16.81	20.29	17.76
METCASH	13.74	11.82	10.68	9.77	8.29
METJE-&-Z	6.32	4.59	-2.25	9.14	7.77
METKOR	9.91	11.95	11.62		5.27
METLIFE	-5.19	4.16	2.03	1.57	1.44
MGX	26.03	31.95	36.43		
MICIND	12.17	11.87	14.46	12.10	7.19
MIDAS	16.79	15.43	13.83	13.22	11.36
MIH/M-WEB	-1.43	-15.63	-14.10	-7.31	
MILPROP	11.58	10.65	10.18		

FINANCIAL PERFORMANCE DATA – ROA (CONTINUED)

COMPANY	1998	1997	1996	1995	1994
MINGRAN	-13.84	5.80	7.06	1.96	-0.67
MINORCO	6.45	10.99	11.37	13.20	9.31
MLNHOLD	8.50	15.48	6.98	4.36	10.00
MMWTECH	7.63				
M-NET/SS	21.58	16.76	16.26	17.76	20.26
MOBILE	7.55	9.45	10.66	8.97	7.52
MOLOPE	45.69				
MONEX	11.80	14.35	-4.66	3.42	10.85
MORIBO	5.75	-6.20	12.71	13.41	1.21
MOULDMED	-23.55				
MSAULI	30.90	18.36	4.86	22.19	21.85
MT-EAGLE	3.89	2.31	5.64	4.00	8.07
MUSTEK	28.11	18.74			
NAIL	7.79	8.79	4.56	5.29	4.37
NAMFISH	22.36	-4.68	-23.98	9.31	16.31
NAMPAK	18.30	20.47	21.25	23.20	20.58
NAMSEA	3.47	9.66	-4.96	20.23	17.02
NANDOS	40.72	26.74			
NASPERS	13.59	17.94	24.50	24.99	20.81
NATCHIX	18.46	15.25	17.64		
NEDCOR	13.30	13.65	12.85	11.46	10.63
NEI-AFR	11.60	7.59	10.73	9.56	10.48
NEIHOLD	11.61	7.58	10.73	9.56	10.48
NETCARE	16.22	6.15			
NEW-MIN	-1.25	-43.57	-11.01	25.54	151.29
NEWPORT	11.32	10.41	10.94	10.73	10.90
NEW-WITS	11.16	12.09	9.79	11.67	10.46
NICTUS	-1.93	6.99	9.44	10.34	9.81
NINIAN	6.04	12.46	11.18	14.25	15.74
NORTHAM	15.59	-14.94	-7.66	-69.50	-118.55
NORVEST	10.37	11.28	10.74		
NUCLICKS	14.28	14.43	15.19	14.44	11.66
NUWORLD	13.71	16.96	14.03	14.45	13.22
OAKFLDS	-0.79	-10.05	-10.81	-30.80	-26.15
OCFISH	31.66	32.57	30.30	28.92	23.62
OCTODEC	13.24	13.52	13.34	13.13	11.46
ODMHOLD	28.44	26.04	17.03	6.10	30.62
OHAGANS	30.80				

FINANCIAL PERFORMANCE DATA – ROA (CONTINUED)

COMPANY	1998	1997	1996	1995	1994
OMEGA	-15.22	18.94	15.90	-5.63	
OMNIA	17.50	17.72	18.37	15.18	15.99
OMNICOR	7.97	14.12	17.44	16.08	16.40
OTK	17.91	15.51			
OTR	-55.75				
OUTSORS	137.16	70.64			
OVBEL	-0.75	-2.17	3.28	8.81	2.75
OZZ	17.55	17.50	17.02	15.45	15.45
PACIFIC	4.81	10.94	2.77	13.65	10.19
PALAMIN	82.13	105.04	113.50	155.04	127.35
PALS	2.03	8.77	23.69	24.80	14.66
PANPROP	11.93	11.79	11.41	10.72	11.21
PARADIGM	29.33				
PARAGON	26.56				
PARAMED	59.90				
PENROSE	27.70	13.60			
PEPGRO	10.62	13.54	6.07	12.46	11.97
PEPKOR	9.20	11.83	9.49	12.46	11.24
PERSBEL	-0.32	13.58	2.70	2.65	2.08
PETMIN	7.46	70.82	53.10	49.99	57.19
PICKNPAY	13.12	11.99	10.70	9.50	12.85
PIKWIK	67.98	91.45	69.19	54.37	63.07
PIONEER	14.51	12.26	10.91	11.74	12.48
PLATE-GL	11.82	18.38	19.96	20.56	20.93
POLIFIN	30.58	35.36	30.37	32.69	
PORTHLD	19.24	14.79	20.20	26.56	23.72
POWTECH	19.34	17.52	11.80	15.28	16.11
PPC	17.52	19.26	19.63	22.95	22.83
PREM-GRP	12.41	11.06	13.84	13.25	15.66
PREMIUM	12.45	12.07	11.64	8.56	
PRESMED	12.80	18.91	19.00	17.56	21.01
PRESTAS	13.69	18.88	22.56	26.01	
PRIMA	13.30	13.71	11.89	11.57	8.91
PRIMATOY	14.87				
PRIME	30.49	36.33	29.57	25.42	10.46
PROFURN	22.37	24.58	18.95	19.22	16.65
PROPFIN	-0.72	-1.25	-3.38	-1.64	0.87
PROSPUR	10.72				

FINANCIAL PERFORMANCE DATA – ROA (CONTINUED)

COMPANY	1998	1997	1996	1995	1994
PSG	6.92	8.76	34.32	24.37	25.16
PSL	2.11	21.98	17.68	16.91	15.91
PUTCO	7.51	1.37	4.76	11.16	8.97
PUTPROP	16.35	16.00	15.75	14.47	13.38
RAD	8.66				
RADIOSPR	14.09				
RAG	16.17	15.98			
RA-HOLD	10.09	6.31	2.21	4.59	
RAI	10.08	6.33	2.20	3.43	
RAINBOW	-10.17	-7.69	-5.34	5.87	4.72
RANGOLD	1.80	6.91		5.20	12.32
RARECO	-18.66	-36.77	-8.74		0.86
REBHOLD	25.45	17.29			
REFCORP	17.83				
RELYANT	10.97	11.67	11.34	8.93	6.84
REMBR-BEH	9.64	8.75	12.54	15.57	16.40
REMGRO	9.63	8.76	12.55	15.57	16.40
RENAISAN	18.36				
RENTSUR	7.01	14.44	7.97	5.68	1.82
RETCORP	24.61	29.94	23.59	15.53	2.14
REUNERT	18.39	12.24	13.05	16.43	17.56
REX-TRUE	12.98	11.79	11.82	11.05	9.13
RICHEMONT	23.33	21.99	18.22	16.41	14.90
RICHWAY	9.33	9.33	10.25	8.13	
RLSPROPS	5.06	7.46	9.71	19.98	25.57
RMBH	2.61	1.10	0.97	1.38	1.34
RMP-PROP	11.06	14.67	14.84	17.12	16.67
RMSPROP	11.52	11.62	10.63	9.65	9.15
ROADCOR	22.58	12.93	17.26	14.44	11.50
ROMATEX	1.95	-4.66	0.48	7.81	13.79
S&JLAND	-0.46	-0.22	-0.30		
S&SHOLD	6.79	6.09	9.38	8.75	6.45
SAAMBOU	14.99	15.17	14.16	11.82	12.19
SAB	16.00	18.44	18.41	17.37	16.15
SABLE	9.58	13.82	12.30	11.04	14.53
SABVEST	5.16	4.88	3.68	2.70	4.06
SA-DRUG	14.53	14.25	13.57	12.39	12.94
SA-EAGLE	4.36	8.60	6.99	3.49	-3.76

FINANCIAL PERFORMANCE DATA – ROA (CONTINUED)

COMPANY	1998	1997	1996	1995	1994
SAFREN	6.92	12.91	14.81	13.97	13.37
SAGEGRP	3.91	3.66	3.28	3.14	2.45
SAIL	16.28				
SAMRAND		1.67	1.20	1.55	2.09
SAMROC	-11.21	-15.81	-24.49	-294.55	
SANLAM	1.75				
SANTAM	8.80	10.86	10.25	10.44	7.68
SAPPI	10.40	5.80	6.51	12.31	2.41
SASANI	29.45	46.89	-2.52	-3.43	-0.08
SASFIN	15.01	15.73	16.23	16.31	13.93
SASOL	18.40	25.59	24.39	22.45	21.56
SAVANHA	3.80				
SBIC	12.00	11.45	11.47	10.57	9.55
SCHAMIN	11.19		13.02	14.95	21.78
SCHARIG	13.20		17.27	17.17	22.66
SEAHARV	27.81	28.88	29.70	31.33	24.20
SEARDEL	7.39	6.83	13.96	14.25	14.53
SEARTEC	14.37	15.11	19.18	17.76	
SENTRY	35.16	16.06	14.89	8.31	7.11
SERVEST	-1.15	3.64	16.54	21.03	17.02
SETHOLD	30.41				
SFG		-0.41	-17.93	-1.47	-8.32
SFTLINE	33.27	15.91			
SFW	13.67	16.94	17.83	13.16	10.37
SHARIND	17.23		24.46	23.64	18.30
SHOPRIT	11.34	13.21	10.80	8.31	5.00
SIB	0.85	0.41	2.07	2.68	-10.05
SILTEK	11.64	13.23	15.80	20.01	18.71
SISA	23.05	20.88	22.72	14.49	14.25
SMC	-140.05				
SONDOR	23.93	20.50	32.83	27.58	23.21
SOVFOOD	18.87	10.06	21.49		
SOWITS	4.78	-2.23	-26.04	-35.89	-36.69
SPANJAARD	20.50	16.88	17.76	5.63	5.36
SPECLTY	15.22	11.12	20.50	17.36	17.50
SPESCOM	20.56	12.99	12.83	11.05	8.41
SPICER		0.62	7.90	26.34	16.02
SPUR	63.40	71.21	82.13	98.78	102.32

FINANCIAL PERFORMANCE DATA – ROA (CONTINUED)

COMPANY	1998	1997	1996	1995	1994
SPURHLD	64.50	73.45	83.11	103.03	107.12
STANTRN	49.68	0.77	-18.03	1.33	5.69
STEERS	44.96	54.87	55.41	41.49	
STOCHOT	10.11	8.14			
STOCKS	6.98	6.27	9.55	8.75	6.45
STORECO	16.50	12.55	18.17	20.20	17.69
STRAND	20.78	4.37	-2.45	3.38	-25.18
SUPRGRP	15.62	19.28	26.47	3.17	10.65
SYCOM	11.08	10.05	10.33	9.78	10.25
TEGKOR	9.66	8.75	12.54	15.57	16.40
TELJOY	18.91	10.07	-9.25	10.29	19.78
TELTRON	18.23	18.73	16.16		
TEMPORA	6.41	6.15	5.92	5.20	6.32
TEREXKO	3.19	10.50			
THABEX	-63.31	-114.29	-768.42	-1584.62	-95.65
THEBE	11.59	17.12	13.62	14.32	13.20
THETA	31.07	3.06	0.80	0.43	
TIB	9.64	8.75	12.54	15.57	16.40
TIGON	23.29	44.93	31.91		
TIGR-OATS	19.14	17.89	18.27	16.97	14.65
TIWHEEL	13.82	15.00	17.15	19.12	19.12
TMX	-0.83	7.83	2.10	14.15	14.41
TOCO	16.19	4.01	10.94	15.87	14.83
TOLARAM	-9.54	-4.24	-1.53	12.60	12.11
TONGAAT	13.23	14.63	16.30	12.59	8.22
TOURVST	38.72	30.36			
TOYOTA	7.38	9.88	13.56	16.53	12.17
TREMATON	8.69				
TRENCOR	7.72	14.58	17.22	15.23	18.24
TRIDELTA	5.90				
TRNPACO	23.39	14.26	13.53	8.73	2.89
TRNSHEX	67.51	72.68	75.70	67.22	71.20
TRUWTHS	23.53				
TWEEFONTN	73.97	110.20	123.78	67.91	107.43
UCS	19.24				
UMBONO	3.87	10.59	7.86		
UNIGRO	14.45	9.89	9.95	8.48	5.18
UNIHOLD	12.83		15.52	18.86	20.44

FINANCIAL PERFORMANCE DATA – ROA (CONTINUED)

COMPANY	1998	1997	1996	1995	1994
UNISERV	2.32	2.51	1.34	18.37	15.72
UNISPIN	-10.77	-6.48	2.91	12.02	9.10
UNITRAN	12.99	12.45	13.80	12.76	6.30
USKO	16.88	19.78	26.83	31.58	18.83
VALAUTO	12.39	11.10	9.82	9.00	9.01
VALCAR	12.51	11.16	9.89	9.14	9.18
VENTEL	7.14	5.14	-4.54	7.79	13.88
VENTRON	18.28	16.16	13.14	16.27	15.46
VESTCOR	8.26		-5.95		7.70
VIKING	107.97				
VOGELS	40.59	36.01	20.62	29.65	20.82
VOLTEX	16.00	17.12	16.06	15.34	11.45
WACO	14.35	7.05	8.42	8.77	8.73
WANKIE	4.40	9.69	9.14	7.78	16.85
WBHO	14.69	11.68	13.35	4.72	6.99
WBHOLD	-0.23	-9.97	13.86	5.26	13.58
WESCAPE	12.94	14.50	1.04	-1.28	-5.02
WESCO	8.18	9.85	12.67	15.14	11.38
WETHLYS	20.74				
WINBEL	8.80	11.66	10.80	10.78	9.79
WINHOLD	8.70	11.57	10.66	10.64	9.64
WIT-G-M	4.38	5.86	14.53	6.81	10.17
WOOLIES	27.61	16.99			
WOOLTRU	17.22	16.74	18.34	20.47	20.57
W-R-CONS	32.03	-19.72	-50.96	-0.50	2.20
YABENG	-5.97	-3.18	3.29	11.11	11.73
YORKCOR	8.31	7.38	-3.96	10.13	14.34
YTHRK	26.33				
Z-C-I	-8.67	-1.04	0.24	0.40	0.10
ZELTIS	14.79	9.17	-9.74		5.44
ZENITH	-5398.39	-674.35	-367.07		

APPENDIX 4.3

FINANCIAL PERFORMANCE DATA – ROE

COMPANY	1998	1997	1996	1995	1994
ABACUS	B	22.22			
ABI	24.94	19.39	19.14	22.83	21.18
ABRAXAS	25.39				
ABSA	19.69	18.45	23.37	16.57	19.10
ACREM	6.03	3.99	9.58	1.44	0.71
ADCOCK	38.12	34.82	27.95	33.81	29.01
ADCORP	62.83	319.35	68.76	37.25	17.68
ADMIRAL	-46.99	-19.72	2.01		
ADONIS	6.91	8.22	9.67	23.25	5.75
ADVED	19.74	9.98			
ADVSOURCE	131.59	95.20	19.50	-44.71	22.97
ADVTECH	33.38	28.35	16.67	2.43	0.62
AECI	-5.73	11.57	20.03	10.79	25.66
AF-&-OVER	12.09	9.61	9.88	10.68	10.45
AFBRAND	21.71				
AF-HARV	11.22	0.00			
AFLIFE	35.27	14.76	14.53	19.41	16.88
AFROX	18.88	18.99	19.88	17.99	16.57
AIDA	86.73	-105.64	-26.82	15.80	7.56
ALEXNDR	16.22	46.38	27.93	29.45	19.35
ALEXWYT	-19.67	1.97	1.03	7.80	6.25
ALIANCE	39.79	46.51			
ALTECH	29.95	18.68	1.05	11.91	11.83
ALTRON	23.64	17.45	7.90	17.01	15.77
ALUDIE	154.61	10.61	2.36	11.35	
AMAPROP	-11.70	1.82	-0.48	3.55	3.33
AMAPS	23.20	27.84			
AMB	14.59				
AME	506.59	B	B	B	B
AMGOLD	25.55	36.79	35.83	48.60	48.49
AMLAC	-46.07	38.81	39.58		
AMMGROUP	13.88				
AMPLATS	98.60	53.40	71.67	103.90	104.32
ANAMINT	7.52	9.79	8.31	7.99	8.26
ANBEECO	4.76	4.11	18.46	16.67	7.08
ANGLO-AM	14.20	17.29	13.57	12.38	12.11

FINANCIAL PERFORMANCE DATA – ROE (CONTINUED)

COMPANY	1998	1997	1996	1995	1994
APEX	2.85	2.00	11.75	13.13	10.28
APLITEC	5.42				
AQUILA	-1.49	-2.38			
ARIES	21.87	39.63	23.27	27.38	26.01
AROMA	-54.93	0.12	15.47	11.26	9.01
ASPEN	-47.45	6.48	25.30	79.35	20.65
ASS-MANG	28.89	15.08	40.50	18.51	19.16
ASSORE	7.25	8.29	9.09	10.53	8.82
ASTRAPAK	56.53				
ATLAS	1.07	0.34	0.53	-0.82	-8.42
AUTOPGE	12.68	12.87	10.37	-7.74	25.82
AUTOQIP	24.51	28.12	26.27	24.13	18.39
A-V-I	9.80	14.53	20.36	18.94	25.69
AVIS	29.18	36.59	34.57		
AVMIN	5.08	16.29	17.92	15.56	16.27
AWETHU	42.98				
BARLOWS	14.91	17.16	15.19	13.43	5.94
BARNEX	B	-94.88	1.25	3.89	2.03
BARPLAT	-16.94	2.24	3.27	B	B
BARPROP	1.14				
BASREAD	65.50	74.64	55.74	-101.36	-138.60
BATECOR	13.03	8.26	-42.98	31.85	
BATEPRO	30.74	31.51	89.90	30.17	13.41
BATSA	36.43	15.36	11.95	8.99	185.81
BEARMAN	16.45	23.21	28.68	29.41	25.19
BEIGE	25.11				
BELL	0.00	8.16	15.96	16.06	
BENCO	-13.43	17.27	9.55	-3.63	-9.43
BEVCON	8.69	8.50	8.87	7.78	6.47
BICAF	21.86	2.06	-6.09	9.92	26.93
BIDVEST	19.55	19.42	30.80	31.44	28.45
BILLCAD		B			
BILLITON	12.13				
BIVEC	-1.32	3.41	2.23	1.41	1.12
BJM	18.34				
BOE	40.40	10.49	23.89	21.28	18.03
BOECORP	3.07	4.53	6.76	6.01	5.41
BOLTONS	10.22	6.23	8.75	22.19	10.18

FINANCIAL PERFORMANCE DATA – ROE (CONTINUED)

COMPANY	1998	1997	1996	1995	1994
BOLWEAR	9.72	5.80	7.38	31.84	7.73
BONATLA	1.20				
BOTREST	B	B	B	B	B
BOUMAT	-8.46	3.07	3.33	19.27	8.59
BOWCALF	28.89	26.86	26.69	27.13	34.50
BRAIT	55.66	8.23	5.09	3.88	-11.23
BRANDCO	26.74	175.17	2491.57	2160.00	2682.35
BRIMSTON	0.00				
BRNWARE	55.51				
BUILDMAX	-6.46	13.39			
BURLINGTN	-42.96	-13.47	0.48	3.81	3.01
BUSBY	24.93				
CADSWEP	20.69	25.40	22.42	24.33	22.00
CAM	-45.93	-168.38	-25.49	-48.95	20.90
CAPITAL	14.60	19.02	11.65	13.35	12.98
CAPSTAR	1.36	12.34	15.26	27.67	15.23
CAPTALL	56.57	15.24	29.07	56.54	19.14
CARE	-41.40	-148.39	11.23	18.18	12.86
CARGO	11.06	6.86	9.63	13.96	13.04
CARSON	29.47	23.03			
CASHBIL	14.87	13.98	2.75	21.28	36.15
CAXTON	-11.90	16.88	26.65	16.32	14.90
CBD-FUND	19.13	17.73	16.95	15.54	14.98
CCHOLD	19.02				
CEDAGRO	27.81				
CEMENCO	-19.09	-23.44	2.95	4.67	-2.49
CENMAG	19.70	21.38	21.71	4.84	-6.10
CENPROP	20.09	17.12	16.52	19.40	15.81
CERAMIC	19.70	16.76	13.72	15.49	11.13
CFC	9.79	9.09	14.64	5.60	19.08
CGS-FOOD	20.90	23.26	23.42	18.86	11.86
CGSMITH	20.13	22.79	22.37	20.89	14.79
CHARIOT	23.31	35.05	-23.07	8.19	
CHEMSERVE	30.83	38.49	27.16	27.43	24.39
CHESTER	13.06	37.11			
CHET	10.73				
CHOICE	-620.32	-145.66	8.58	51.36	69.29
CITYHLD		-91.26	-15.75	54.65	32.77

FINANCIAL PERFORMANCE DATA – ROE (CONTINUED)

COMPANY	1998	1997	1996	1995	1994
CITYLDG	18.41	21.33	29.91	32.14	35.05
CLINICS	13.86	4.12	22.10	28.04	36.81
CLYDE	5.39	6.40	4.24	11.25	19.02
CMH	22.53	20.02	39.69	45.65	23.08
COASTAL	9.15	18.62	-8.05		
COATES	13.26	47.60	16.97	19.40	17.91
COMAIR	33.56				
COMPAREX	135.93	22.01	23.80	58.64	
COMPASS	B	-475.00	1.50	4.21	1.50
CONAFEX	0.83	-1.26	4.84	2.50	13.18
CONCOR	21.85	20.60	24.80	26.51	23.36
CONFED	15.82	21.09	51.24	19.94	21.44
CONFRAM	6.98	5.71	7.90	8.90	7.67
CON-MURCH	B	-496.34	77.88	159.95	101.31
CONNECT	30.21				
CONSHU	7.30	2.32	18.12	19.78	14.56
CONTROL	10.43	11.70	31.46	37.91	18.11
COPI	8.17	4.79	7.55	11.80	12.64
CORNICK	-17.13	5.16	10.23	10.56	8.05
COROHLD	8.07	6.91	14.64	24.44	35.41
CORPCAP	49.87	5.49	7.44	22.65	9.09
CORPCOM	74.31				
CORPGRO	19.72	55.07	B	B	B
CORWIL	0.85	6.07	5.78	6.69	3.14
CROOKES	18.63	10.41	21.31	11.08	4.62
CTP	27.01	23.10	24.35	21.13	17.66
CULLINAN	22.07	-112.79	-2.18	-21.59	-35.42
CULTEL	11.88	22.57	34.44	37.26	38.79
CUSAF	14.88	11.07	18.37	14.11	15.13
DAEWOO	-247.49	-108.02	9.31	16.23	2.38
DALYS	1.47	25.36	21.00	23.94	19.77
DATATEC	82.83	50.25	31.22	48.26	
DEBEERS	8.40	8.84	13.97	10.65	8.46
DECHOLD	27.80	39.06	87.35	76.98	47.37
DELCORP	62.53	37.33	38.01	35.12	51.14
DELFOOD	62.56	59.88	39.96	34.92	53.01
DELHOLD	62.53	36.96	37.14	35.12	51.14
DELTA	31.94	30.03	32.81	25.38	26.52

FINANCIAL PERFORMANCE DATA – ROE (CONTINUED)

COMPANY	1998	1997	1996	1995	1994
DIDATA	55.74	43.30	35.91	40.38	23.65
DISTIL	20.34	19.83	17.69	15.20	12.87
DON	-51.25	-11.77	12.53	-6.47	
DORBYL	15.52	15.51	16.52		-2.61
DUIKERS	B	1077.27	901.30	630.52	95.09
DUNLOP	5.63	2.59	17.76	14.96	16.89
EDGARS	12.84	19.73	25.39	28.83	31.74
ED-LBATE	17.16	11.10	3.71	43.31	26.81
EDUCOR	21.43	40.13	51.18		
ELEXIR	13.21				
ELLERINE	16.92	20.30	18.83	18.88	23.36
EMPOWER	5.91				
ENERGY	-15.85	9.67	62.78		
ENSERV	6.14		34.69		
ESIC	B		-6.92	-0.06	
ETINGTN	5.34	13.33	51.83	6.42	4.08
EUREKA	38.23	7.00	11.32	37.35	35.83
FALCON	-53.69	20.02	103.41	138.66	209.33
FASHAF	16.42	21.77	20.46	21.11	9.48
FBCFID		25.73	21.86	21.46	43.30
FEDICS	30.20				
FEDSURE	25.66	23.02	14.86	13.52	13.87
FELTEX	2.69	16.81	14.94	15.52	
FINTECH	31.49	41.34	36.88	39.70	33.07
FIRSTRAND	12.61	21.52	16.55	28.51	17.28
FIT	2.79	3.08	3.68	4.10	4.03
FMCOTEC	-145.34	-40.25	-21.52	-13.70	24.51
FORBES	-63.75	35.70	40.79		
FORIM	48.35	61.05	29.26	10.88	9.20
FORTUNE	14.76	22.63	24.47	23.83	
FOSCHINI	16.03	15.19	25.61	27.55	26.99
FRALEX	15.98	45.74	27.31	28.91	19.20
FRAME	6.87	5.55	7.63	8.56	7.35
FRANSAF	-5.08	30.62	17.59	27.36	17.45
FREDDEV	1.71	31.48	2.93	5.04	-18.95
FRIDGEM	-53.05	20.61	18.60		
G5HOLD	15.91	8.92	10.29	14.16	1.81
GARDIAN	10.44	9.55	9.54	12.20	9.03

FINANCIAL PERFORMANCE DATA – ROE (CONTINUED)

COMPANY	1998	1997	1996	1995	1994
GEM	B	B	B	B	B
GENBEL	8.38	6.62	-11.05	37.58	19.91
GENCOR	3.82	36.85	28.13	7.32	5.09
GEN-OPTIC	14.79	15.13	12.63	5.87	10.47
GENSEC	18.61	16.33	15.21		
GFSA	26.60	2.85	16.60	18.27	-9.40
GILBOA			B		
GLENMIB	B				
GLODINA	-10.26	7.18	2.30	16.56	15.27
GLOHOLD	-99.39	12.99	30.23	23.81	
GLOPVT	14.91	13.37	15.12	14.43	22.33
GOLDSTEIN	0.00	15.21	22.48	5.87	1.27
GRAYPROP	18.02	17.46	16.57	15.26	14.20
GRINAKER	22.23	18.06			
GRINCOR	8.30	13.44	26.25	16.57	19.57
GRINTEK	23.31	13.51	55.81	29.05	27.37
GROPROP	28.05	26.90	20.82	20.38	19.33
GROUP-5	15.91	8.92	10.30	14.17	1.81
GROWPNT	-120.55	55.64	257.03	B	B
GUBINGS	-4.64	3.88	-16.55	11.49	8.99
GUNDLE	2.66	17.67	26.80	22.61	6.19
HARVEST	20.04	12.23	17.44	19.28	13.99
HARWILL	-40.55	-8.53	14.23	13.77	12.50
HCI	1.61	11.04	85.69	63.58	-156.09
HEAVEN	40.92	32.75			
HICORL	9.55	9.33		15.78	18.07
HIVELD	11.44	4.80	3.47	13.64	9.42
HLH	0.36	5.87	0.04	0.78	10.53
HOMECHOIC	29.13	28.54	20.46		
HOWDEN	15.36	26.32	36.04		
HUDACO	21.39	30.72	30.38	28.66	24.89
HYPROP	2.73	0.09	0.91	0.09	0.10
I-&-J	14.65	15.39	8.12	13.38	14.90
ICH	54.29	47.94	17.54	4.78	6.28
IHTECH	125.00	-1449.63			
ILIAD	32.54				
ILLOVO	32.05	28.26	18.18	14.70	10.91
IMPERIAL	13.90	12.77	15.12	20.61	15.66

FINANCIAL PERFORMANCE DATA – ROE (CONTINUED)

COMPANY	1998	1997	1996	1995	1994
IMPHOLD	4.98		0.00	0.00	18.50
IMPLATS	63.71	26.05	22.08	38.00	21.18
INDNEWS		46.82	38.60	40.22	18.12
INFINITI	61.37				
INHOLD	8.65	16.08	10.23	11.04	12.22
INMINS	25.26	121.76	37.26	37.36	41.66
INTRUST	1.26	1.90	2.13	2.45	1.43
INVICTA	31.51	61.27	89.20	65.53	
INVSTEC	13.60	15.94	11.37	12.16	11.98
IOTA	0.01	14.38	6.27	-4.31	11.82
ISCOR	10.22	-10.57	10.77	10.89	7.68
ITI-TECH	46.92				
ITLTILE	20.93	20.58	18.91	12.15	10.61
IXCHANGE	B				
JASCO	51.52	37.44	36.52	42.44	38.24
JDGROUP	20.75	15.33	25.17	23.65	30.54
JOHNNIC	17.94	13.30	5.68	16.25	28.59
KAIROS		2.81	-99.45	-68.72	-60.72
KAROS	-53.74	6.08	3.86	2.94	-0.69
KELGRAN	5.46	21.46	20.70	11.30	18.45
KERSAF	30.71	13.84	15.73	19.44	19.22
KGMEDIA	5.17	18.45	21.95	38.97	17.41
KH-PROPS	93.20	1.05	5.78	0.05	12.26
KING	41.45	32.71			
KOLOSUS	-18.16	-26.87	0.62	15.71	
KTL	11.02	10.79	43.31	25.33	29.68
KWV-BEL	7.91	7.62	7.62	6.09	3.67
LANGEBERG	9.68	11.47	17.87	14.17	17.41
LASER	22.63	11.85	-25.48	-0.16	14.73
LA-STORE	85.33	310.89	B	-51.84	-27.68
LEFIC	0.00	0.00	0.00	0.02	0.01
LENCO	11.05	12.04	-5.90	18.63	26.58
LESRNET	18.88	38.34	30.66	37.02	24.76
LIBERTY	4.31	10.44	5.65	14.84	6.16
LIB-HOLD	4.72	10.41	5.79	11.18	3.40
LIBSIL	2.63	2.52	2.19	2.04	2.13
LIBVEST	2.99	2.34	0.01	0.00	1.58
LIFESTYLE	36.45	15.28			

FINANCIAL PERFORMANCE DATA – ROE (CONTINUED)

COMPANY	1998	1997	1996	1995	1994
LIONMATCH	13.56	14.20	13.42	10.43	54.57
LOGTEK	50.36	13.78	42.77	34.76	29.52
LONFIN	0.38	3.24	7.09	2.76	46.14
LONMIN PL	18.26	27.97	4.70	11.24	8.30
L-T-A	17.61	28.92	26.24	19.69	20.62
LUSEA	-109.92	124.85	-218.64		-51.21
M-&-F	0.00	6.44	6.19	5.83	5.47
M&R-HLD	21.45	-2.91	17.36	16.75	14.00
MACADAM	12.96	28.97	39.83	36.88	22.04
MACMED	17.79	29.96	18.50	15.73	22.82
MALBAK	9.39	6.50	16.66	16.34	13.31
MARANDA	124.77	78.45	54.36	26.24	
MARCONS	4.70	4.92	16.36	15.37	14.31
MARLIN	10.00	18.58	7.83	-5.80	-31.97
MARTPROP	2.31	12.01	12.45		
MASONITE	6.53	11.71	12.20	13.82	10.41
MATHOMO	-80.40	37.63	39.94		
MAWENZI	8.12	9.91	12.00	10.95	16.33
MAXTYRE	24.47				
MBTECH	B				
M-CELL	30.57	12.27	0.57		
M-C-M	B	B	B	B	B
MCRTAIL	-54.03	26.13	45.82	64.20	63.29
MDMGRO	7.13	13.06	22.66	21.27	33.38
MEDCLIN	19.48	18.35	27.37	18.75	16.24
MEDEX	-7.60	13.27	5.95	5.01	
MERCANTIL	6.44				
MESSINA	-4.31	6.04	7.88	8.82	4.67
METAIR	12.42	23.32	15.96	19.12	15.63
METCASH	27.15	27.10	22.15	28.89	31.22
METJE-&-Z	6.43	8.71	-16.93	11.48	7.98
METKOR	12.69	17.67	14.85		-2.35
METLIFE	-69.80	66.42	28.27	24.72	19.65
MGX	28.10	27.92	88.48		
MICIND	19.37	89.88	37.84	33.67	20.85
MIDAS	21.23	19.61	20.34	23.20	11.82
MIH/M-WEB	0.86	311.63	-17.33	63.78	
MILPROP	81.46	-98.51	-76.95		

FINANCIAL PERFORMANCE DATA – ROE (CONTINUED)

COMPANY	1998	1997	1996	1995	1994
MINGRAN	-28.84	-6.45	-9.63	-55.58	-15.61
MINORCO	9.70	15.73	15.83	18.12	10.24
MLNHOLD	10.08	18.62	7.88	-6.08	-43.43
MMWTECH	9.80				
M-NET/SS	B	119.82	99.59	B	84.82
MOBILE	6.00	7.72	9.90	8.76	6.69
MOLOPE	64.61				
MONEX	12.47	16.86	-15.81	-33.58	5.72
MORIBO	8.76	-26.52	27.34	281.82	B
MOULDMED	185.07				
MSAULI	20.99	4.23	-0.64	21.17	29.11
MT-EAGLE	0.19	-1.43	5.23	2.89	13.56
MUSTEK	51.65	40.26			
NAIL	23.47	8.86	20.35	8.23	4.68
NAMFISH	128.30	-77.07	-47.96	8.81	22.51
NAMPAK	19.19	21.12	23.32	24.31	21.96
NAMSEA	-11.22	-0.90	-13.19	28.55	20.66
NANDOS	98.99	B			
NASPERS	11.38	19.73	35.70	29.63	19.93
NATCHIX	22.10	16.54	19.50		
NEDCOR	19.97	21.14	22.11	21.48	20.36
NEI-AFR	12.69	8.18	20.24	15.14	8.51
NEIHOLD	12.60	8.07	20.04	15.13	8.51
NETCARE	13.66	4.82			
NEW-MIN	-187.08	B	B	B	B
NEWPORT	12.60	13.44	12.03	11.33	11.47
NEW-WITS	16.39	2.94	14.46	16.39	-6.78
NICTUS	-37.58	-0.36	7.82	12.84	20.12
NINIAN	2.58	11.27	11.41	13.52	14.92
NORTHAM	25.04	-22.27	-9.02	-678.46	B
NORVEST	0.01	-2.62	1.83		
NUCLICKS	21.48	21.01	21.58	16.44	10.16
NUWORLD	15.99	19.88	19.62	21.35	17.78
OAKFLDS	-13.82	-23.38	-16.88	-41.92	-73.58
OCFISH	39.46	42.64	33.57	37.21	27.27
OCTODEC	3.25	5.24	15.23	56.43	7.03
ODMHOLD	29.61	27.35	18.13	6.35	48.06
OHAGANS	10243.36				

FINANCIAL PERFORMANCE DATA – ROE (CONTINUED)

COMPANY	1998	1997	1996	1995	1994
OMEGA	-39.38	24.34	90.03	B	
OMNIA	22.68	31.25	32.23	23.33	24.55
OMNICOR	8.39	22.98	15.16	13.97	23.14
OTK	21.69	19.14			
OTR	0.00				
OUTSORS	B	80.94			
OVBEL	-10.22	-21.98	-3.49	8.26	-7.60
OZZ	15.66	17.99	14.89	29.77	13.99
PACIFIC	-5.51	2.91	-44.02	12.33	6.40
PALAMIN	B	1375.28	1701.38	15265.68	971.88
PALS	3.96	6.73	28.74	34.14	24.29
PANPROP	-0.79	6.01	2.18	3.46	4.44
PARADIGM	41.30				
PARAGON	27.10				
PARAMED	B				
PENROSE	43.58	18.19			
PEPGRO	13.55	17.14	7.66	18.44	20.54
PEPKOR	18.85	24.87	14.03	25.04	25.45
PERSBEL	-11.69	14.50	2.61	2.62	2.16
PETMIN	71.84	B	292.96	50.37	138.34
PICKNPAY	31.99	33.07	27.22	20.60	25.26
PIKWIK	103.47	162.81	132.13	101.20	119.68
PIONEER	18.00	16.82	14.28	14.84	16.11
PLATE-GL	17.41	34.87	35.92	29.62	32.85
POLIFIN	29.16	36.04	40.56	31.66	
PORTHLD	17.62	18.55	23.11	33.20	35.49
POWTECH	20.12	13.32	8.45	14.03	18.86
PPC	19.81	18.04	18.99	20.89	17.82
PREM-GRP	16.31	15.28	35.55	9.94	19.58
PREMIUM	105.28	74.64	30.54	27.49	
PRESMED	10.82	18.44	18.91	18.62	23.13
PRESTAS	-1.54	34.00	58.20	76.44	
PRIMA	14.85	15.28	13.27	12.71	9.69
PRIMATOY	24.34				
PRIME	296.26	B	B	B	B
PROFURN	26.90	34.75	27.89	19.42	24.72
PROPFIN	-7.13	-2.64	-8.69	-4.36	-0.17
PROSPUR	8.91				

FINANCIAL PERFORMANCE DATA – ROE (CONTINUED)

COMPANY	1998	1997	1996	1995	1994
PSG	85.24	18.64	114.17	135.19	-138.94
PSL	24.25	28.83	11.56	26.32	20.04
PUTCO	9.65	1.09	5.84	8.52	15.86
PUTPROP	8.71	9.66	9.37	9.39	7.39
RAD	6.90				
RADIOSPR	43.56				
RAG	18.70	17.23			
RA-HOLD	10.63	5.58	3.92	10.90	
RAI	10.60	5.56	3.87	7.94	
RAINBOW	-28.42	-21.93	-24.34	3.63	0.67
RANGOLD	-259.17	35.30		50.40	8.15
RARECO	-515.54	-183.19	-13.87		-1.44
REBHOLD	259.65	741.83			
REFCORP	14.96				
RELYANT	2.09	9.24	9.70	9.99	3.96
REMBR-BEH	8.39	9.80	9.75	10.42	12.95
REMGRO	8.38	9.79	9.91	10.44	12.96
RENAISAN	21.25				
RENTSUR	41.18	113.62	77.56	101.28	16.24
RETCORP	74.88	49.72	32.67	32.15	-51.02
REUNERT	23.67	4.56	18.73	25.74	29.94
REX-TRUE	11.46	9.08	9.11	9.82	10.29
RICHEMONT	56.96	58.52	85.04	26.06	13.12
RICHWAY	81.70	83.56	88.54	84.47	
RLSPROPS	3.40	18.64	10.85	61.66	43.08
RMBH	16.86	69.51	18.31	13.31	19.42
RMP-PROP	10.30	39.39	18.80	32.59	14.00
RMSPROP	43.22	10.13	8.35	-82.78	1.54
ROADCOR	29.38	13.26	22.81	18.51	17.84
ROMATEX	2.12	-13.82	0.36	7.86	12.02
S&JLAND	-0.46	-0.11	-1.02		
S&SHOLD	-15.34	12.81	17.50	15.58	17.32
SAAMBOU	28.36	21.85	26.17	23.89	26.99
SAB	14.26	24.74	25.13	21.75	18.23
SABLE	-40.60	11.65	14.25	13.99	17.09
SABVEST	4.70	3.04	28.17	2.75	4.17
SA-DRUG	16.29	22.26	15.85	15.68	13.91
SA-EAGLE	12.30	22.45	11.31	17.22	0.43

FINANCIAL PERFORMANCE DATA – ROE (CONTINUED)

COMPANY	1998	1997	1996	1995	1994
SAFREN	9.56	14.38	17.73	18.55	18.12
SAGEGRP	17.73	16.91	23.83	20.34	26.44
SAIL	B				
SAMRAND		1.37	0.84	-15.11	7.42
SAMROC	-25.10	-146.55	-5806.90	B	
SANLAM	1.40				
SANTAM	12.82	12.62	13.11	15.18	12.22
SAPPI	14.07	3.99	5.74	11.69	0.69
SASANI	66.78	85.57	58.17	81.39	-121.23
SASFIN	16.85	18.84	27.32	25.22	19.94
SASOL	19.16	25.83	25.82	23.32	21.68
SAVANHA	-15.59				
SBIC	17.37	18.14	17.99	15.17	17.96
SCHAMIN	8.19		7.59	11.78	29.40
SCHARIG	12.32		16.32	21.10	37.02
SEAHARV	23.22	22.97	25.23	23.16	20.27
SEARDEL	10.16	4.61	14.45	21.19	15.52
SEARTEC	15.63	15.41	18.70	15.51	
SENTRY	B	41.42	34.73	-13.60	5.17
SERVEST	6.65	18.23	21.69	38.95	17.51
SETHOLD	B				
SFG		-1490.87	-119.39	-7.30	-30.36
SFTLINE	50.11	29.07			
SFW	13.62	15.94	15.12	9.97	7.26
SHARIND	21.11		31.91	39.25	104.67
SHOPRIT	38.02	38.78	19.98	30.29	19.85
SIB	-8.12	9.18	26.58	24.30	24.04
SILTEK	24.84	16.43	70.12	32.65	27.15
SISA	20.38	16.72	18.04	18.26	18.53
SMC	B				
SONDOR	30.25	33.07	59.98	65.29	-36.58
SOVFOOD	22.31	9.31	25.83		
SOWITS	22.41	-13.63	-54.49	69.43	-7.46
SPANJAARD	47.93	39.04	24.71	5.20	8.23
SPECLTY	15.92	13.41	21.28	19.02	19.39
SPESCOM	28.53	-18.04	18.08	11.93	4.18
SPICER		-68.23	-14.39	-10.21	182.17
SPUR	56.81	74.49	97.58	145.54	267.60

FINANCIAL PERFORMANCE DATA – ROE (CONTINUED)

COMPANY	1998	1997	1996	1995	1994
SPURHLD	62.83	101.05	145.62	683.58	B
STANTRN	64.41	-121.80	-61.65	-16.67	6.49
STEERS	121.02	82.68	95.19	43.02	
STOCHOT	8.75	5.98			
STOCKS	-16.64	13.90	15.28	15.57	17.31
STORECO	17.14	12.24	18.24	21.75	19.89
STRAND	10.79	-3.42	-26.43	4.40	-1001.72
SUPRGRP	18.37	30.54	26.25	22.16	14.66
SYCOM	12.94	11.82	10.76	10.29	10.79
TEGKOR	8.42	9.74	9.65	10.41	12.91
TELJOY	30.03	20.01	-119.65	-45.62	29.60
TELTRON	14.41	14.04	15.88		
TEMPORA	5.66	5.10	5.25	4.89	4.95
TEREXKO	63.83	11.32			
THABEX	-233.99	B	B	B	B
THEBE	8.47	21.27	9.07	60.36	72.38
THETA	59.31	3.86	0.68	26.34	
TIB	8.39	9.73	9.64	10.41	12.93
TIGON	35.06	56.92	55.58		
TIGR-OATS	21.02	21.85	25.34	20.91	14.04
TIWHEEL	20.57	22.01	21.92	33.51	36.72
TMX	-7.59	-4.34	5.23	18.26	16.30
TOCO	B	-A	14.32	17.02	17.31
TOLARAM	-138.09	-41.31	-15.53	17.99	18.25
TONGAAT	19.84	18.38	23.16	13.40	7.20
TOURVST	51.18	54.56			
TOYOTA	6.52	5.99	10.12	13.18	7.42
TREMATON	5.57				
TRENCOR	27.82	19.86	32.62	10.90	8.41
TRIDELTA	8.41				
TRNPACO	36.47	17.07	15.13	8.95	-6.55
TRNSHEX	75.46	92.04	80.51	4.23	78.93
TRUWTHS	23.85				
TWEEFONTN	182.92	341.24	342.58	180.93	234.78
UCS	17.04				
UMBONO	3.29	-34.32	5.41		
UNIGRO	B	10.44	10.13	8.51	5.06
UNIHOLD	0.00		21.62	32.91	28.03

FINANCIAL PERFORMANCE DATA – ROE (CONTINUED)

COMPANY	1998	1997	1996	1995	1994
UNISERV	2.73	3.24	13.12	47.61	43.20
UNISPIN	0.00	-22.13	0.84	14.39	10.99
UNITRAN	19.13	17.43	23.34	24.31	24.72
USKO	115.77	84.15	56.29	46.98	24.43
VALAUTO	7.74	8.61	9.66	10.05	10.68
VALCAR	8.01	8.80	9.90	10.55	11.27
VENTEL	8.62	3.83	-10.06	7.35	15.66
VENTRON	23.83	17.35	7.75	16.88	15.64
VESTCOR	7.82		-109.41		5.90
VIKING	128.18				
VOGELS	20.60	24.50	25.40	33.12	-8.37
VOLTEX	137.01	19.23	21.85	26.68	16.66
WACO	20.55	11.96	16.36	-35.19	27.52
WANKIE	7.38	11.35	11.92	9.53	19.39
WBHO	32.15	26.64	29.05	12.44	18.92
WBHOLD	-4.45	-13.00	13.92	5.52	13.53
WESCAPE	13.45	25.04	26.15	-29.72	-805.67
WESCO	6.57	6.41	10.82	10.87	6.43
WETHLYS	15.99				
WINBEL	11.78	74.56	28.80	27.03	20.20
WINHOLD	11.52	73.12	27.95	26.07	19.32
WIT-G-M	3.16	145.87	9.46	-1.49	7.12
WOOLIES	0.00	19.68			
WOOLTRU	36.76	19.04	24.63	31.63	27.69
W-R-CONS	40.95	46.19	16.06	0.82	3.26
YABENG	-4.42	-2.47	3.15	54.88	16.87
YORKCOR	4.22	11.26	-18.02	18.98	9.55
YTHRK	28.37				
Z-C-I	-14.66	-1.08	-29.72	-39.21	-3.03
ZELTIS	11.71	3.02	-1.93		-5.78
ZENITH	B	B	B		

APPENDIX 4.4

FINANCIAL PERFORMANCE DATA – EVA

COMPANY	1998	1997	1996	1995	1994
ABACUS	-0.44				
ABI	113.48	64.77	32.86	25.07	20.02
ACREM	-2.20	-2.64	-1.69	-3.47	-0.48
ADCOCK	190.84	112.69	-13.98	40.29	36.47
ADCORP	-14.14	-4.42	-0.72	-0.05	-0.97
ADMIRAL	-6.67	-9.10			
ADONIS	0.49	0.78	0.83	-0.13	-0.07
ADVSOURCE	4.42	2.33	-1.00	1.27	1.13
ADVTECH	-33.23	-1.74	0.15	-4.63	-5.16
AECI	-255.49	-220.27	-216.39	-242.70	-280.26
AF-&-OVER	3.11	-1.94	-3.38	-1.58	-1.04
AFROX	117.91	90.49	55.31	43.83	31.06
AIDA	0.40	-3.93	-2.43	-0.66	-0.73
ALEXNDR	54.50	-8.67	3.14	0.83	10.27
ALEXWYT	-5.95	-0.29	-2.09	-0.95	-1.71
ALIANCE	1.31				
ALTECH	19.35	8.83	-28.84	-30.40	-27.90
ALTRON	34.64	-1.37	-57.91	-13.70	-27.21
ALUDIE	0.25	0.10	0.26		
AMAPS	3.73	6.49			
AME	10.67				
AMLAC	1.26	0.70			
ANBEECO	0.78	-1.43	1.33	-0.42	-2.11
ARIES	-0.90	-0.79	0.69	1.76	1.31
ASPEN	-17.69	-14.43	-2.55	1.06	-0.19
AUTOPGE	7.22	3.44	8.41	-3.65	0.15
AUTOQIP	3.39	3.97	2.09	1.66	0.76
A-V-I	-340.72	-248.47	-218.12	-109.05	-159.09
AVIS	101.17	100.72			
BARLOWS	-54.34	-232.05	-296.85	-359.62	-1147.50
BASREAD	32.10	18.47	16.91	-8.42	-11.33
BATECOR	-2.05	-11.30	-28.17		
BATEPRO	13.01	11.69	5.90	0.94	0.29
BATSA	61.99	11.23	6.08	-0.67	-37.90
BEARMAN	0.04	5.96	5.54	5.39	4.46
BELL	-67.55	-8.18	-1.64		

FINANCIAL PERFORMANCE DATA – EVA (CONTINUED)

COMPANY	1998	1997	1996	1995	1994
BEVCON	-184.18	-196.04	-184.30	-175.99	-189.62
BICAF	7.72	-4.27	-20.39	-2.65	8.65
BIDVEST	-76.60	-85.20	11.90	-35.66	-49.90
BILLCAD	-4.74	-0.08			
BIVEC	2406.39	-65.92	-75.92	-94.78	-103.25
BOLTONS	4.06	0.69	-0.97	9.34	5.37
BOLWEAR	-0.96	-4.32	-3.88	-0.02	-0.75
BOUMAT	-83.60	-23.80	-20.43	-1.42	-11.94
BOWCALF	4.94	3.56	2.75	0.88	1.56
BRANDCO	-1.07	-0.39	0.56	0.30	0.22
BUILDMAX	-8.01				
BURLINGTN	-1.83	-1.64	-1.02	-0.85	-0.80
CADSWEP	61.04	19.41	9.82	23.07	13.87
CARE	-3.54	-0.74	-21.52	2.73	
CARGO	9.92	7.08	2.65	6.95	5.25
CARSON	1.84				
CASHBIL	14.14	1.56	-3.24	2.52	9.14
CAXTON	-69.86	5.77	-3.93	1.79	-0.61
CEMENCO	-8.24	-18.21	-0.44	0.54	-0.54
CENMAG	0.57	0.63	0.37	-0.62	-0.24
CERAMIC	17.29	6.73	2.91	8.57	4.52
CGS-FOOD	624.79	171.70	13.56	194.25	65.76
CGSMITH	722.96	359.51	179.08	337.45	170.09
CHARIOT	21.89	0.65	1.86	0.30	0.57
CHEMSERVE	10.16	-0.34	6.26	8.37	1.24
CHOICE	-236.89	-86.80	-13.62	2.69	-0.51
CITYHLD	-9.90	-12.27	-3.30	3.38	-0.38
CITYLDG	-10.16	-6.18	-1.49	3.18	0.36
CLINICS	-17.00	-94.70	-7.89	18.02	3.18
CLYDE	-1.85	-1.23	-0.93	0.30	0.94
CMH	9.41	8.13	13.28	15.37	5.09
COASTAL	-34.20	-0.34			
COATES	-8.32	-5.02	3.94	5.11	3.59
COMPAREX	129.61	-20.84	-5.83		
CONAFEX	-4.09	-5.06	-3.12	-2.63	-2.20
CONCOR	14.59	5.59	4.41	8.06	7.22
CONFRAM	-82.70	-98.71	-84.18	-46.75	-99.87
CONSHU	-21.66	-30.55	0.75	1.16	-1.34

FINANCIAL PERFORMANCE DATA – EVA (CONTINUED)

COMPANY	1998	1997	1996	1995	1994
CONTROL	-2.47	-2.23	2.13	6.52	0.30
COPI	-40.59	-37.42	-37.04	-24.92	-23.14
CORNICK	-31.50	-28.06	-11.48	-5.99	-2.39
CORPCAP	-5.01	1.35	1.13	4.49	2.32
CORPGRO	-15.28	-0.03	260.74	-17.31	-12.14
CROOKES	-2.20	-2.38	-3.78	-0.58	-6.94
CTP	62.05	38.19	19.33	10.87	12.93
CULLINAN	-0.98	-59.81	-16.77	-74.35	-49.47
CULTEL	-3.31	-0.42	0.42	0.54	0.06
DAEWOO	-54.26	-51.73	-3.87	-2.81	-4.07
DATATEC	-18.16	-2.66	-0.77		
DECHOLD	2.08	2.61	1.65	1.77	0.99
DELCORP	-343.36	-546.61	-432.03	-463.08	-401.48
DELFOOD	-244.50	-390.28	-435.06	-472.56	-397.55
DELHOLD	-229.79	-309.58	-281.63	-309.18	-249.75
DELTA	32.12	37.56	15.04	13.15	15.31
DIDATA	128.61	25.77	2.99	-0.56	0.12
DISTIL	27.03	9.11	-10.64	-19.16	-19.88
DON	-54.07	-18.78	-7.42	-1.97	-2.73
DORBYL	-3.83	-53.81	0.51	-85.18	-102.06
DUNLOP	-67.98	-87.03	-47.59	-3.65	-17.72
EDGARS	-33.99	59.68	87.82	95.36	88.90
ED-LBATE	11.35	-19.57	-10.45	-4.25	20.05
EDUCOR	-60.74	-12.62			
ELLERINE	-26.76	11.56	-14.11	-11.09	-3.56
ENERGY	15.16	47.39			
ENSERV	17.19	13.36			
ESIC	-2.63	-3.92	-3.58	-0.31	-0.08
FASHAF	17.23	2.59	-0.64	2.68	-3.88
FELTEX	-5.82	-1.40	-12.72		
FINTECH	28.87	6.45	15.57	24.63	27.47
FMCOTEC	-10.44	-6.03	-11.09	-5.54	2.49
FORTUNE	3.86	2.03	2.05		
FOSCHINI	22.77	4.51	53.77	48.90	35.32
FRALEX	53.97	-8.26	3.13	0.95	10.55
FRAME	20.77	-31.88	-20.32	12.86	-34.25
FRANSAF	0.87	8.99	-0.72	3.04	0.53
FRIDGEM	-65.53	0.45			

FINANCIAL PERFORMANCE DATA – EVA (CONTINUED)

COMPANY	1998	1997	1996	1995	1994
G5HOLD	16.64	-5.13	-13.20	-9.08	-37.64
GEN-OPTIC	1.82	1.19	1.07	0.17	0.87
GILBOA	-1.14	-1.07	-14.56	-2.50	-2.50
GLODINA	-12.98	-3.02	-7.25	-0.13	0.97
GLOHOLD	-95.89	-39.47	-14.38		
GOLDSTEIN	-10.63	-2.27	0.72	-4.29	-4.95
GRINAKER	57.00				
GRINCOR	-63.18	-35.08	-41.44	-13.21	-37.05
GRINTEK	191.99	-31.01	-10.64	12.34	24.53
GROUP-5	18.72	-2.71	-10.62	-7.01	-34.75
GUBINGS	-13.00	-10.31	-23.72	-3.64	-4.26
GUNDLE	-3.96	-0.07	1.94	1.82	0.38
HARWILL	-13.62	-4.52	0.39	1.83	1.27
HEAVEN	3.60				
HICORL	0.52	-0.17	-0.94	-0.31	1.06
HIVELD	-348.67	-573.84	-745.21	-426.57	-378.02
HLH	-282.70	-292.62	-278.28	-274.02	-137.38
HOMECHOIC	10.66	8.93			
HOWDEN	10.36	21.84			
HUDACO	17.09	35.63	33.69	13.44	4.39
I-&-J	-8.63	-0.28	-48.70	-20.49	-15.28
IHTECH	1.84				
ILLOVO	147.36	-22.00	-60.48	-63.77	-70.72
IMPERIAL	51.65	-52.06	-60.16	50.43	54.88
INDNEWS	-86.69	-61.35	-32.08	-11.78	
INMINS	3.26	2.56	0.26	0.70	0.91
INVICTA	5.59	10.27	10.70	5.52	1.93
ISCOR	-398.30	-1016.80	-1219.20	-1032.60	-1137.50
ITLTILE	10.22	6.36	3.73	-0.88	0.70
JASCO	2.78	0.77	-1.46	2.59	2.60
JDGROUP	-31.38	-87.75	-13.91	-16.05	-3.85
KAIROS	-16.12	-20.92	-16.54	-38.42	-65.87
KAROS	-44.60	-37.58	-32.53	-29.78	-34.84
KERSAF	-269.37	-246.38	-256.39	-113.90	-129.96
KGMEDIA	-3.71	-1.55	0.56	1.60	0.54
KING	-1.75				
KOLOSUS	-74.51	-67.91	-25.12		
KTL	121.28	-47.37	-14.85	15.05	18.14

COMPANY	1998	1997	1996	1995	1994
KWV-BEL	-55.05	-59.68	-58.90	-56.41	-56.06
LANGEBERG	-24.76	-16.57	-6.95	13.63	14.96
LASER	-1.33	-3.87	-19.44	-18.16	-4.38
LA-STORE	14.72	7.96	-1.89	-4.42	-3.29
LEFIC	-78.62	-71.50	-60.06	-43.81	-34.14
LENCO	-13.83	-6.83	-18.84	-0.77	10.16
LESRNET	9.77	18.83	1.40	3.54	
LIFESTYLE	11.98				
LIONMATCH	-16.07	-15.75	-20.95	-24.82	-16.26
LOGTEK	-2.84	-1.10	1.19	0.39	0.08
L-T-A	72.40	103.62	41.56	43.24	45.61
LUSEA	-1.96	-0.03	-12.35	-1.07	-1.30
M&R-HLD	-135.35	-706.38	-299.38	-201.93	-219.07
MACADAM	-6.60	0.41	1.87	2.33	0.10
MACMED	-4.11	-1.85	-0.64	-0.75	-0.30
MALBAK	-70.48	-182.47	-25.18	-73.37	-79.69
MASONITE	-4.83	-5.56	-6.84	-4.86	-4.65
MATHOMO	4.05	1.80			
M-CELL	90.10	13.29			
MCRTAIL	-181.31	16.65	191.68	82.49	19.56
MEDCLIN	-16.18	-14.90	17.95	-4.53	1.12
MEDEX	-43.04	-40.82	-29.34	-11.24	-5.21
METAIR	5.82	7.98	12.93	20.20	16.87
METCASH	57.70	61.35	-20.39	10.49	3.80
METJE-&-Z	-4.34	-3.91	-9.61	-0.91	-1.24
METKOR	-63.31	-32.19	-20.06	-103.45	-112.43
MGX	1.98	0.76			
MICIND	-4.40	-1.96	3.53	3.54	-0.99
MIDAS	11.89	9.44	5.88	1.44	3.59
MIH/M-WEB	-181.36	-813.59	-462.86		
MINGRAN	-4.68	-3.95	-3.58	-4.97	-10.69
M-NET/SS	108.08	16.20	1.34	4.22	211.42
MOBILE	-87.55	-66.79	-50.53	-43.53	-46.02
MONEX	-19.44	-7.66	-17.34	-13.35	-6.73
MORIBO	-12.03	-6.04	-1.40	0.95	-1.70
MT-EAGLE	-4.51	-5.10	-3.00	-2.52	
MUSTEK	42.64				
NAMFISH	7.55	-10.58	-28.64	0.50	2.91
NAMPAK	147.43	181.64	161.93	138.34	113.19
NAMSEA	-10.97	-2.90	-28.91	11.14	9.38
NANDOS	10.43				

FINANCIAL PERFORMANCE DATA – EVA (CONTINUED)

COMPANY	1998	1997	1996	1995	1994
NASPERS	-56.38	-19.39	30.49	55.09	
NATCHIX	6.87	3.15			
NEI-AFR	-2.55	-15.16	-10.20	-10.99	-8.19
NEIHOLD	8.56	-2.00	-1.62	-2.16	1.57
NETCARE	27.79				
NICTUS	-5.27	-1.25	-0.59		-0.46
NINIAN	5.32	11.46	8.75	10.68	10.88
NUCLICKS	34.51	31.19	20.43	15.55	8.04
NUWORLD	-7.20	0.09	-2.20	-0.16	-0.73
OAKFLDS	-2.04	-3.35	-4.36	-7.08	-1.43
OCFISH	53.52	51.77	33.07	29.78	12.50
OMEGA	-36.17	0.60	-0.04	-2.68	-1.28
OMNIA	6.93	23.02	13.54	5.59	7.96
OMNICOR	-125.08	-34.79	-64.12	-64.64	-13.69
OTK	46.81				
OZZ	-1.51	-2.47	-9.42	-6.62	-6.79
PACIFIC	-4.41	-1.31	-6.57	-0.28	-1.44
PALS	-1.77	0.35	2.79	3.66	0.73
PENROSE	-1.47	-1.60	-6.03	-5.83	-5.86
PEPGRO	-13.72	-6.00	-42.93	-8.33	-2.21
PEPKOR	299.87	229.26	78.36	97.42	83.46
PERSBEL	-92.26	-13.11	-23.53	-19.77	-16.57
PICKNPAY	130.74	116.71	132.79	65.99	71.71
PIKWIK	32.04	28.34	29.03	21.47	26.07
PLATE-GL	96.37	282.52	121.91	110.33	132.71
POLIFIN	217.67	386.33	-16.34		
PORTHLD	21.26	-14.01	22.15	35.78	40.50
POWTECH	14.10	4.33	-47.01	-15.38	-11.00
PPC	-21.55	-77.47	-90.78	-48.87	-130.00
PRESMED	-14.80	-4.95	0.99	-2.54	-1.46
PRIME	-119.85	-26.00	-4.15	0.62	
PROFURN	-8.44	6.99	5.49	7.69	-1.53
PUTCO	28.97	-17.27	-11.83	-5.92	5.07
RAG	8.82				
RAINBOW	-360.78	-356.03	-307.25	-136.49	-152.02
RARECO	-3.56	-6.04	-2.60	-2.55	-0.73
REBHOLD	11.93				
RELYANT	-60.03	-53.15	-58.36	-49.35	-43.41
REMBR-BEH	-1180.40	-1171.50	-921.96	-612.86	-490.86

FINANCIAL PERFORMANCE DATA – EVA (CONTINUED)

COMPANY	1998	1997	1996	1995	1994
REMGRO	-1404.10	-1360.40	-1069.50	-751.44	-608.28
RETCORP	15.64	1.76	1.51	1.14	-2.44
REUNERT	130.61	61.51	37.66	65.01	49.31
REX-TRUE	-7.33	-11.48	-12.79	-10.31	-8.31
RICHEMONT	-31.11	-50.04	-123.32	62.75	89.49
ROADCOR	-2.02	-1.55	-0.05	0.94	-0.21
ROMATEX	-17.14	-55.59	-41.25	-27.25	-12.78
S&JLAND	-22.39	-23.06	-26.99	-21.51	-21.99
S&SHOLD	-80.64	-87.49	-35.14	-21.09	-7.79
SAB	1131.79	982.63	1047.33	666.07	409.61
SABVEST	-37.10	-31.73	-12.74	-11.76	-10.44
SA-DRUG	17.63	14.19	2.50	-11.53	-4.52
SAFREN	-409.49	-253.30	-215.38	-6.21	-102.22
SAIL	-0.38	-0.05	-0.08	-0.03	-0.02
SAMROC	-2.37	-1.68	-1.15		
SAPPI	-1484.90	-1947.90	-1905.10	-662.51	-1524.80
SASANI	13.46	0.02	-6.89	-1.93	-5.08
SASOL	-197.14	102.00	-94.62	-233.97	-531.91
SEAHARV	29.33	20.91	17.60	22.65	10.94
SEARDEL	-66.87	-123.82	-35.93	-4.81	-1.68
SEARTEC	-5.50	-5.16	-6.52		
SENTRY	-3.32	-0.18	5.32	2.29	-0.80
SERVEST	-15.83	-5.39	-1.56	-0.17	-0.93
SFTLINE	3.14				
SFW	-25.40	-4.49	-17.80	-40.04	-52.16
SHARIND	6.62	15.67	20.51	1.16	
SHOPRIT	163.59	128.60	83.98	73.54	29.17
SILTEK	-0.01	-17.74	-9.15	13.21	8.49
SISA	46.90	-36.06	-114.54	0.28	0.87
SONDOR	3.51	2.07	2.72	2.78	2.39
SOVFOOD	5.11	-1.85			
SPANJAARD	1.49	1.11	0.60	-0.17	-0.22
SPECLTY	-0.70	-11.76	-4.95	2.49	5.20
SPESCOM	-4.80	-8.14	-6.86	-6.25	-6.60
SPICER	-19.08	-18.04	-5.69	2.86	-0.20
SPUR	8.64	8.72	7.74	6.60	5.57
SPURHLD	9.18	8.42	7.57	6.42	5.94
STANTRN	-0.39	-12.11	-66.48	-18.02	-11.86

FINANCIAL PERFORMANCE DATA – EVA (CONTINUED)

COMPANY	1998	1997	1996	1995	1994
STEERS	1.69	4.75	3.04		
STOCHOT	-7.12				
STOCKS	-69.36	-76.89	-27.72	-19.75	-6.43
STORECO	1.46	-1.02	-0.41	0.95	0.98
STRAND	1.86	-3.16	-5.60	-2.23	-18.71
SUPRGRP	-70.26	-5.32	-0.44	-8.54	-1.69
TEGKOR	-1138.00	-1138.70	-896.21	-588.71	-472.17
TELJOY	42.87	37.93	-26.22	17.37	30.14
TELTRON	14.77	10.49			
TEREXKO	-19.57				
TIB	-1137.90	-1135.20	-893.48	-586.17	-468.57
TIGR-OATS	249.57	177.75	20.09	171.67	92.12
TIWHEEL	-3.75	1.83	-2.01	3.94	2.28
TMX	-3.17	2.14	-4.34	1.16	2.61
TOCO	-5.86	278.31	-37.26	-15.06	-11.17
TOLARAM	-11.44	-7.59	-6.75	1.86	1.44
TONGAAT	-130.57	-227.69	-234.87	-308.98	-391.13
TOURVST	8.75				
TOYOTA	-239.92	-187.28	-100.46	-44.02	-86.42
TRENCOR	-191.51	-79.95	-39.75	24.59	-13.41
TRNPACO	2.22	0.61	-0.01	0.10	-1.00
UNIGRO	-0.63	-0.19	-0.09	-0.09	-0.43
UNIHOLD	1.97	8.18	6.25	8.78	10.69
UNISERV	-24.45	-21.57	-30.32	10.14	5.21
UNISPIN	-49.56	-48.86	-8.11	11.99	13.49
UNITRAN	30.43	43.73	19.35	10.20	1.16
USKO	-3.18	6.04	11.66	31.17	2.27
VALAUTO	0.43	-0.03	0.05	-0.01	0.16
VALCAR	0.20	-0.18	-0.18	-0.22	-0.10
VENTEL	-4.48	-4.63	-8.15	-4.04	-1.74
VENTRON	103.09	52.55	4.88	35.45	14.40
VOLTEX	62.28	-9.89	-25.63	-58.31	-52.84
WACO	60.09	-48.98	-32.22	-28.32	-39.16
WBHO	23.86	17.69	0.75	0.64	2.28
WBHOLD	-5.08	-9.59	0.20	-2.20	0.53
WESCO	-105.66	-110.46	-49.23	8.31	-36.39
WINBEL	-0.77	2.11	2.72	2.93	1.36
WINHOLD	-0.79	2.04	2.61	2.81	1.24

FINANCIAL PERFORMANCE DATA – EVA (CONTINUED)

COMPANY	1998	1997	1996	1995	1994
WOOLIES	277.17				
WOOLTRU	230.94	91.95	117.07	136.38	157.69
YORKCOR	-1.09	-2.58	-7.70	-0.45	1.55
ZELTIS	1.34	-3.86	-21.98	-6.75	-8.22

APPENDIX 5

APPENDIX 5.1

AVERAGE FINANCIAL PERFORMANCE MEASURES PER SECTOR

JSE SECTOR 6

GROUP WITHOUT ERP's	AV ERP	ROC 1998	ROC 1997	ROC 1996	ROC 1995	ROC 1994
ANAMINT		7.52	9.79	8.31	7.99	8.26
ICH		54.29	47.94	17.54	4.78	6.28
Av. for group without ERP's		30.91	28.87	12.93	6.39	6.28

GROUP WITH ERP's	AV ERP	ROC 1998	ROC 1997	ROC 1996	ROC 1995	ROC 1994
DEBEERS	55	8.40	8.84	13.97	10.65	8.46
GEM	19	B	B	B	B	B
ODMHOLD	39	29.61	27.35	18.13	6.07	32.33
TRNSHEX	56	75.46	92.04	80.51	4.23	78.93
Av. for group with ERP's		37.82	42.74	37.54	6.98	39.91

GROUP WITHOUT ERP's	AV ERP	ROA 1998	ROA 1997	ROA 1996	ROA 1995	ROA 1994
ANAMINT		7.22	9.20	7.86	7.55	7.81
ICH		70.16	69.88	17.47	4.77	6.26
Av. for group without ERP's		38.69	39.54	12.67	6.16	7.04

GROUP WITH ERP's	AV ERP	ROA 1998	ROA 1997	ROA 1996	ROA 1995	ROA 1994
DEBEERS	55	8.31	10.30	11.58	11.77	7.71
GEM	19	-225.82	-36.02	-36.97	-55.59	-12.79
ODMHOLD	39	28.44	26.04	17.03	6.10	30.62
TRNSHEX	56	67.51	72.68	75.70	67.22	71.20
Av. for group with ERP's		-30.39	18.25	16.84	7.38	24.19

GROUP WITHOUT ERP's	AV ERP	ROE 1998	ROE 1997	ROE 1996	ROE 1995	ROE 1994
ANAMINT		7.52	9.79	8.31	7.99	8.26
ICH		54.29	47.94	17.54	4.78	6.28
Av. for group without ERP's		30.91	28.87	12.93	6.39	7.27

JSE SECTOR 6 (continued)

GROUP WITH ERP's	AV ERP	ROE 1998	ROE 1997	ROE 1996	ROE 1995	ROE 1994
DEBEERS	55	8.40	8.84	13.97	10.65	8.46
GEM	19	B	B	B	B	B
ODMHOLD	39	29.61	27.35	18.13	6.35	48.06
TRNSHEX	56	75.46	92.04	80.51	4.23	78.93
Av. for group with ERP's		37.82	42.74	37.54	7.08	45.15

JSE SECTOR 28

GROUP WITHOUT ERP's	AV ERP	ROC 1998	ROC 1997	ROC 1996	ROC 1995	ROC 1994
BOTREST		-9538.20	-2054.86	-6404.35	-1318.51	-814.13
M-C-M		B	B	B	B	B
Z-C-I		-14.66	-1.08	-29.72	-39.21	-3.03
Av. for group without ERP's		-4776.43	-1027.97	-3217.04	-678.86	-408.58

GROUP WITH ERP's	AV ERP	ROC 1998	ROC 1997	ROC 1996	ROC 1995	ROC 1994
ASS-MANG	61	28.71	15.07	40.48	18.51	19.16
CON-MURCH	37	-56.42	-134.85	77.88	159.95	101.31
KELGRAN	58	4.37	17.41	16.16	9.60	17.89
MARANDA	58	107.40	76.81	54.36	26.24	
MARLIN	26	8.74	15.79	6.49	-4.86	-15.61
MLNHOLD	31	8.80	15.85	6.54	-5.05	-17.92
MSAULI	51	20.99	4.23	-0.64	21.17	29.11
PALAMIN	75	133.46	216.66	716.50	2719.73	318.61
Av. for group with ERP's		32.01	28.37	114.72	368.16	64.65

GROUP WITHOUT ERP's	AV ERP	ROA 1998	ROA 1997	ROA 1996	ROA 1995	ROA 1994
BOTREST		-56.49	-7.72	29.13	-12.64	17.64
M-C-M		-11.48	-13.67	8.85	24.36	16.41
Z-C-I		-8.67	-1.04	0.24	0.40	0.10
Av. for group without ERP's		-25.55	-7.48	12.74	4.04	11.38

JSE SECTOR 28 (continued)

GROUP WITH ERP's	AV ERP	ROA 1998	ROA 1997	ROA 1996	ROA 1995	ROA 1994
ASS-MANG	61	30.42	24.50	40.78	24.60	27.75
CON-MURCH	37	-5.84	-69.41	60.13	120.44	64.64
KELGRAN	58	7.83	16.71	13.51	10.19	10.87
MARANDA	58	67.91	71.51	50.29	26.37	
MARLIN	26	8.48	15.45	6.94	4.29	9.85
MLNHOLD	31	8.50	15.48	6.98	4.36	10.00
MSAULI	51	30.90	18.36	4.86	22.19	21.85
PALAMIN	75	82.13	105.04	113.50	155.04	127.35
Av. for group with ERP's		28.79	24.71	37.12	45.94	38.90

GROUP WITHOUT ERP's	AV ERP	ROE 1998	ROE 1997	ROE 1996	ROE 1995	ROE 1994
BOTREST		B	B	B	B	B
M-C-M		B	B	B	B	B
Z-C-I		-14.66	-1.08	-29.72	-39.21	-3.03
Av. for group without ERP's		-14.66	-1.08	-29.72	-39.21	-3.03

GROUP WITH ERP's	AV ERP	ROE 1998	ROE 1997	ROE 1996	ROE 1995	ROE 1994
ASS-MANG	61	28.89	15.08	40.50	18.51	19.16
CON-MURCH	37	B	-496.34	77.88	159.95	101.31
KELGRAN	58	5.46	21.46	20.70	11.30	18.45
MARANDA	58	124.77	78.45	54.36	26.24	
MARLIN	26	10.00	18.58	7.83	-5.80	-31.97
MLNHOLD	31	10.08	18.62	7.88	-6.08	-43.43
MSAULI	51	20.99	4.23	-0.64	21.17	29.11
PALAMIN	75	B	1375.28	1701.38	15265.68	971.88
Av. for group with ERP's		33.37	136.70	265.08	2209.25	152.07

JSE SECTOR 32

GROUP WITHOUT ERP's	AV ERP	ROC 1998	ROC 1997	ROC 1996	ROC 1995	ROC 1994
AMGOLD		25.55	36.79	35.83	48.60	48.49
CAM		-38.86	-7.65	-0.35	-0.90	0.41
FALCON		-53.69	20.02	103.41	138.66	199.81
NEW-WITS		16.39	2.94	14.46	16.39	-6.78
WIT-G-M		3.16	145.08	8.95	-1.39	6.86
Av. for group without ERP's		-9.49	39.44	32.46	40.27	49.76

GROUP WITH ERP's	AV ERP	ROC 1998	ROC 1997	ROC 1996	ROC 1995	ROC 1994
ANGLO-AM	69	12.44	15.64	12.28	11.04	10.84
ASSORE	65	7.25	8.29	9.09	10.53	8.82
AVMIN	44	4.77	14.86	16.03	13.85	14.69
BILLITON	48	9.88				
GENCOR	59	2.54	24.83	23.83	7.12	4.96
GFSA	40	25.93	2.68	15.86	17.63	-9.09
LONMIN PL	43	11.16	15.93	2.57	7.31	5.69
MINORCO	30	5.47	9.24	9.26	11.56	7.73
NEW-MIN	26	-187.08	B	B	B	B
PETMIN	33	64.61	348.04	88.48	46.49	64.75
RANGOLD	39	-31.08	18.32		46.11	7.11
SCHAMIN	27	6.29		5.91	9.89	23.55
VOGELS	30	20.60	24.50	25.40	33.12	-8.37
W-R-CONS	49	40.48	40.96	13.04	0.75	3.09
Av. for group with ERP's		-0.48	47.57	20.16	17.95	11.15

GROUP WITHOUT ERP's	AV ERP	ROA 1998	ROA 1997	ROA 1996	ROA 1995	ROA 1994
AMGOLD		17.24	22.99	19.44	27.80	29.99
CAM		0.91	8.64	9.12	8.81	9.84
FALCON		-40.93	10.13	57.36	75.24	104.88
NEW-WITS		11.16	12.09	9.79	11.67	10.46
WIT-G-M		4.38	5.86	14.53	6.81	10.17
Av. for group without ERP's		-1.45	11.94	22.05	26.07	33.07

JSE SECTOR 32 (continued)

GROUP WITH ERP's	AV ERP	ROA 1998	ROA 1997	ROA 1996	ROA 1995	ROA 1994
ANGLO-AM	69	13.54	12.41	12.79	11.36	11.16
ASSORE	65	8.30	8.73	9.92	10.55	8.49
AVMIN	44	12.09	14.38	13.23	14.39	14.01
BILLITON	48	11.69				
GENCOR	59	1.65	17.48	18.92	6.70	6.08
GFSA	40	6.76	15.47	13.82	17.01	14.88
LONMIN PL	43	7.00	10.24	12.27	11.06	8.86
MINORCO	30	6.45	10.99	11.37	13.20	9.31
NEW-MIN	26	-1.25	-43.57	-11.01	25.54	151.29
PETMIN	33	7.46	70.82	53.10	49.99	57.19
RANGOLD	39	1.80	6.91		5.20	12.32
SCHAMIN	27	11.19		13.02	14.95	21.78
VOGELS	30	40.59	36.01	20.62	29.65	20.82
W-R-CONS	49	32.03	-19.72	-50.96	-0.50	2.20
Av. for group with ERP's		11.38	11.68	9.76	16.08	26.03

GROUP WITHOUT ERP's	AV ERP	ROE 1998	ROE 1997	ROE 1996	ROE 1995	ROE 1994
AMGOLD		25.55	36.79	35.83	48.60	48.49
CAM		-45.93	-168.38	-25.49	-48.95	20.90
FALCON		-53.69	20.02	103.41	138.66	209.33
NEW-WITS		16.39	2.94	14.46	16.39	-6.78
WIT-G-M		3.16	145.87	9.46	-1.49	7.12
Av. for group without ERP's		-10.90	7.45	27.53	30.64	55.81

JSE SECTOR 32 (continued)

GROUP WITH ERP's	AV ERP	ROE 1998	ROE 1997	ROE 1996	ROE 1995	ROE 1994
ANGLO-AM	69	14.20	17.29	13.57	12.38	12.11
ASSORE	65	7.25	8.29	9.09	10.53	8.82
AVMIN	44	5.08	16.29	17.92	15.56	16.27
BILLITON	48	12.13				
GENCOR	59	3.82	36.85	28.13	7.32	5.09
GFSA	40	26.60	2.85	16.60	18.27	-9.40
LONMIN PL	43	18.26	27.97	4.70	11.24	8.30
MINORCO	30	9.70	15.73	15.83	18.12	10.24
NEW-MIN	26	-187.08	B	B	B	B
PETMIN	33	71.84	B	292.96	50.37	138.34
RANGOLD	39	-259.17	35.30		50.40	8.15
SCHAMIN	27	8.19		7.59	11.78	29.40
VOGELS	30	20.60	24.50	25.40	33.12	-8.37
W-R-CONS	49	40.95	46.19	16.06	0.82	3.26
Av. for group with ERP's		-14.83	23.13	40.71	19.99	18.52

JSE SECTOR 35

GROUP WITHOUT ERP's	AV ERP	ROC 1998	ROC 1997	ROC 1996	ROC 1995	ROC 1994
BARNEX		B	-94.88	1.25	3.89	2.03
FREDDEV		1.71	31.48	2.93	5.04	-18.95
SMC		-186.55				
SOWITS		22.41	-13.63	-54.49	69.43	-7.21
Av. for group without ERP's		-54.14	-25.68	-16.77	26.12	-8.04

GROUP WITH ERP's	AV ERP	ROC 1998	ROC 1997	ROC 1996	ROC 1995	ROC 1994
BENCO	23	-7.62	17.27	9.54	-3.62	-9.37
OTR	29	-71.24				
THABEX	14	-146.00	B	B	B	-275.00
Av. for group with ERP's		-74.95	17.27	9.54	-3.62	-142.19

GROUP WITHOUT ERP's	AV ERP	ROA 1998	ROA 1997	ROA 1996	ROA 1995	ROA 1994
BARNEX		-111.18	-48.34	3.82	4.20	2.11
FREDDEV		1.67	6.07	3.88	4.34	18.20
SMC		-140.05				
SOWITS		4.78	-2.23	-26.04	-35.89	-36.69
Av. for group without ERP's		-61.20	-14.83	-6.11	-9.12	-5.46

JSE SECTOR 35 (continued)

GROUP WITH ERP's	AV ERP	ROA 1998	ROA 1997	ROA 1996	ROA 1995	ROA 1994
BENCO	23	-2.10	16.27	10.23	-4.33	-2.33
OTR	29	-55.75				
THABEX	14	-63.31	-114.29	-768.42	-1584.62	-95.65
Av. for group with ERP's		-40.39	-49.01	-379.10	-794.48	-48.99

GROUP WITHOUT ERP's	AV ERP	ROE 1998	ROE 1997	ROE 1996	ROE 1995	ROE 1994
BARNEX		B	-94.88	1.25	3.89	2.03
FREDDEV		1.71	31.48	2.93	5.04	-18.95
SMC		B				
SOWITS		22.41	-13.63	-54.49	69.43	-7.46
Av. for group without ERP's		12.06	-25.68	-16.77	26.12	-8.13

GROUP WITH ERP's	AV ERP	ROE 1998	ROE 1997	ROE 1996	ROE 1995	ROE 1994
BENCO	23	-13.43	17.27	9.55	-3.63	-9.43
OTR	29	0.00				
THABEX	14	-233.99	B	B	B	B
Av. for group with ERP's		-82.47	17.27	9.55	-3.63	-9.43

JSE SECTOR 46

GROUP WITHOUT ERP's	AV ERP	ROC 1998	ROC 1997	ROC 1996	ROC 1995	ROC 1994
AMAPROP		-8.75	1.34	-0.36	2.68	2.52
BONATLA		0.43				
COMPASS		12.33	-27.93	0.27	0.74	0.26
CONFED		15.82	21.09	51.24	19.94	21.44
FORIM		40.41	45.46	19.18	6.94	6.34
MARCONS		4.19	4.47	16.36	15.37	14.31
OVBEL		-7.77	-14.93	-2.47	5.47	-4.71
PROPFIN		-6.78	-2.55	-8.69	-4.21	-0.15
PUTPROP		7.19	7.33	6.65	6.32	4.83
SABLE		-36.12	9.94	12.29	11.53	13.95
SAMRAND			0.96	0.68	-15.11	7.42
WESCAPE		12.40	17.51	1.72	-6.08	-302.49
Av. for group without ERP's		3.03	5.70	8.81	3.96	-21.48

JSE SECTOR 46 (continued)

GROUP WITH ERP's	AV ERP	ROC 1998	ROC 1997	ROC 1996	ROC 1995	ROC 1994
MAWENZI	26	8.12	9.91	12.00	10.95	16.33
RMP-PROP	57	7.42	24.60	10.80	17.56	7.20
Av. for group with ERP's		7.77	17.26	11.40	14.26	11.77

GROUP WITHOUT ERP's	AV ERP	ROA 1998	ROA 1997	ROA 1996	ROA 1995	ROA 1994
AMAPROP		7.43	6.01	6.35	5.08	5.41
BONATLA		8.60				
COMPASS		12.32	12.05	10.36	9.73	9.38
CONFED		21.92	23.54	23.91	27.11	29.25
FORIM		18.49	20.87	14.08	9.29	9.36
MARCONS		7.47	15.25	15.23	14.28	13.38
OVBEL		-0.75	-2.17	3.28	8.81	2.75
PROPFIN		-0.72	-1.25	-3.38	-1.64	0.87
PUTPROP		16.35	16.00	15.75	14.47	13.38
SABLE		9.58	13.82	12.30	11.04	14.53
SAMRAND			1.67	1.20	1.55	2.09
WESCAPE		12.94	14.50	1.04	-1.28	-5.02
Av. for group without ERP's		10.33	10.94	9.10	8.95	8.67

GROUP WITH ERP's	AV ERP	ROA 1998	ROA 1997	ROA 1996	ROA 1995	ROA 1994
MAWENZI	26	5.62	14.59	15.59	13.77	11.08
RMP-PROP	57	11.06	14.67	14.84	17.12	16.67
Av. for group with ERP's		8.34	14.63	15.22	15.45	13.88

JSE SECTOR 46 (continued)

GROUP WITHOUT ERP's	AV ERP	ROE 1998	ROE 1997	ROE 1996	ROE 1995	ROE 1994
AMAPROP		-11.70	1.82	-0.48	3.55	3.33
BONATLA		1.20				
COMPASS		B	-475.00	1.50	4.21	1.50
CONFED		15.82	21.09	51.24	19.94	21.44
FORIM		48.35	61.05	29.26	10.88	9.20
MARCONS		4.70	4.92	16.36	15.37	14.31
OVBEL		-10.22	-21.98	-3.49	8.26	-7.60
PROPFIN		-7.13	-2.64	-8.69	-4.36	-0.17
PUTPROP		8.71	9.66	9.37	9.39	7.39
SABLE		-40.60	11.65	14.25	13.99	17.09
SAMRAND			1.37	0.84	-15.11	7.42
WESCAPE		13.45	25.04	26.15	-29.72	-805.67
Av. for group without ERP's		2.26	-33.00	12.39	3.31	-66.52

GROUP WITH ERP's	AV ERP	ROE 1998	ROE 1997	ROE 1996	ROE 1995	ROE 1994
MAWENZI	26	8.12	9.91	12.00	10.95	16.33
RMP-PROP	57	10.30	39.39	18.80	32.59	14.00
Av. for group with ERP's		9.21	24.65	15.40	21.77	15.17

JSE SECTOR 49

GROUP WITHOUT ERP's	AV ERP	ROC 1998	ROC 1997	ROC 1996	ROC 1995	ROC 1994
ATLAS		0.25	0.09	0.10	-0.06	-0.79
GROWPNT		-0.34	0.24	0.36	0.79	-0.01
HYPROP		0.75	0.02	0.25	0.03	0.03
MILPROP		0.32	-1.01	-1.19		
NORVEST		0.00	-0.27	0.18		
OCTODEC		0.27	0.40	0.98	2.86	0.28
PANPROP		-0.23	1.48	0.43	0.67	0.83
PREMIUM		1.10	0.33	0.10	0.09	
RICHWAY		0.25	0.23	0.23	0.21	
RMSPROP		0.72	0.14	0.11	-1.98	0.05
Av. for group without ERP's		0.31	0.17	0.16	0.33	0.07

JSE SECTOR 49 (continued)

GROUP WITH ERP's	AV ERP	ROC 1998	ROC 1997	ROC 1996	ROC 1995	ROC 1994
BARPROP	14	0.03				
KH-PROPS	13	2.21	0.02	0.10	0.00	0.09
RLSPROPS	43	2.01	10.56	4.51	21.06	9.09
Av. for group with ERP's		1.42	5.29	2.31	10.53	4.59

GROUP WITHOUT ERP's	AV ERP	ROA 1998	ROA 1997	ROA 1996	ROA 1995	ROA 1994
ATLAS		10.20	9.19	9.64	10.48	7.23
GROWPNT		13.41	13.08	11.85	8.83	5.79
HYPROP		13.48	12.80	10.46	9.71	8.44
MILPROP		11.58	10.65	10.18		
NORVEST		10.37	11.28	10.74		
OCTODEC		13.24	13.52	13.34	13.13	11.46
PANPROP		11.93	11.79	11.41	10.72	11.21
PREMIUM		12.45	12.07	11.64	8.56	
RICHWAY		9.33	9.33	10.25	8.13	
RMSPROP		11.52	11.62	10.63	9.65	9.15
Av. for group without ERP's		11.75	11.53	11.01	9.90	8.88

GROUP WITH ERP's	AV ERP	ROA 1998	ROA 1997	ROA 1996	ROA 1995	ROA 1994
BARPROP	14	7.06				
KH-PROPS	13	12.89	12.48	11.16	11.59	9.96
RLSPROPS	43	5.06	7.46	9.71	19.98	25.57
Av. for group with ERP's		8.34	9.97	10.44	15.79	17.77

GROUP WITHOUT ERP's	AV ERP	ROE 1998	ROE 1997	ROE 1996	ROE 1995	ROE 1994
ATLAS		1.07	0.34	0.53	-0.82	-8.42
GROWPNT		-120.55	55.64	257.03	B	B
HYPROP		2.73	0.09	0.91	0.09	0.10
MILPROP		81.46	-98.51	-76.95		
NORVEST		0.01	-2.62	1.83		
OCTODEC		3.25	5.24	15.23	56.43	7.03
PANPROP		-0.79	6.01	2.18	3.46	4.44
PREMIUM		105.28	74.64	30.54	27.49	
RICHWAY		81.70	83.56	88.54	84.47	
RMSPROP		43.22	10.13	8.35	-82.78	1.54
Av. for group without ERP's		19.74	13.45	32.82	12.62	0.94

JSE SECTOR 49 (continued)

GROUP WITH ERP's	AV ERP	ROE 1998	ROE 1997	ROE 1996	ROE 1995	ROE 1994
BARPROP	14	1.14				
KH-PROPS	13	93.20	1.05	5.78	0.05	12.26
RLSPROPS	43	3.40	18.64	10.85	61.66	43.08
Av. for group with ERP's		32.58	9.85	8.32	30.86	27.67

JSE SECTOR 50

GROUP WITHOUT ERP's	AV ERP	ROC 1998	ROC 1997	ROC 1996	ROC 1995	ROC 1994
BARLOWS		11.74	13.66	12.28	11.23	4.80
BATSA		36.43	15.36	11.95	8.99	185.81
CORPGRO		16.73	40.53	B	B	B
KAIROS			2.06	-66.72	-51.35	-50.73
LENCO		8.58	10.38	-5.13	15.28	21.39
METJE-&-Z		4.03	6.50	-14.94	10.20	7.45
MT-EAGLE		0.17	-1.25	4.49	2.48	11.87
RICHEMONT		24.91	32.79	57.37	21.84	9.72
Av. For group without ERP's		14.66	15.00	-0.10	2.67	27.19

GROUP WITH ERP's	AV ERP	ROC 1998	ROC 1997	ROC 1996	ROC 1995	ROC 1994
A-V-I	30	8.79	12.71	17.21	15.71	21.18
LIONMATCH	47	13.51	14.00	13.03	9.97	50.05
REMBR-BEH	27	8.23	9.35	9.04	9.64	12.31
REMGRO	31	8.23	9.34	9.19	9.66	12.31
SABVEST	12	4.68	3.02	28.03	2.75	4.17
TEGKOR	31	8.26	9.29	8.95	9.63	12.27
TIB	31	8.23	9.28	8.94	9.63	12.29
Av. for group with ERP's		8.56	9.57	13.48	9.57	17.80

GROUP WITHOUT ERP's	AV ERP	ROA 1998	ROA 1997	ROA 1996	ROA 1995	ROA 1994
BARLOWS		13.64	12.97	12.94	11.95	5.56
BATSA		36.83	16.88	11.99	5.61	9.15
CORPGRO		16.67	30.03	39.27	90.09	134.72
KAIROS			-5.41	-2.77	-7.03	-9.06
LENCO		11.91	13.26	9.95	14.81	17.20
METJE-&-Z		6.32	4.59	-2.25	9.14	7.77
MT-EAGLE		3.89	2.31	5.64	4.00	8.07
RICHEMONT		23.33	21.99	18.22	16.41	14.90
Av. for group without ERP's		16.08	12.08	11.62	18.12	23.54

JSE SECTOR 50 (continued)

GROUP WITH ERP's	AV ERP	ROA 1998	ROA 1997	ROA 1996	ROA 1995	ROA 1994
A-V-I	30	9.10	12.03	13.40	16.35	15.61
LIONMATCH	47	14.81	15.70	15.30	14.31	16.59
REMBR-BEH	27	9.64	8.75	12.54	15.57	16.40
REMGRO	31	9.63	8.76	12.55	15.57	16.40
SABVEST	12	5.16	4.88	3.68	2.70	4.06
TEGKOR	31	9.66	8.75	12.54	15.57	16.40
TIB	31	9.64	8.75	12.54	15.57	16.40
Av. for group with ERP's		9.66	9.66	11.79	13.66	14.55

GROUP WITHOUT ERP's	AV ERP	ROE 1998	ROE 1997	ROE 1996	ROE 1995	ROE 1994
BARLOWS		14.91	17.16	15.19	13.43	5.94
BATSA		36.43	15.36	11.95	8.99	185.81
CORPGRO		19.72	55.07	B	B	B
KAIROS			2.81	-99.45	-68.72	-60.72
LENCO		11.05	12.04	-5.90	18.63	26.58
METJE-&-Z		6.43	8.71	-16.93	11.48	7.98
MT-EAGLE		0.19	-1.43	5.23	2.89	13.56
RICHEMONT		56.96	58.52	85.04	26.06	13.12
Av. for group without ERP's		20.81	21.03	-0.70	1.82	27.47

GROUP WITH ERP's	AV ERP	ROE 1998	ROE 1997	ROE 1996	ROE 1995	ROE 1994
A-V-I	30	9.80	14.53	20.36	18.94	25.69
LIONMATCH	47	13.56	14.20	13.42	10.43	54.57
REMBR-BEH	27	8.39	9.80	9.75	10.42	12.95
REMGRO	31	8.38	9.79	9.91	10.44	12.96
SABVEST	12	4.70	3.04	28.17	2.75	4.17
TEGKOR	31	8.42	9.74	9.65	10.41	12.91
TIB	31	8.39	9.73	9.64	10.41	12.93
Av. for group with ERP's		8.81	10.12	14.41	10.54	19.45

JSE SECTOR 50 (continued)

GROUP WITHOUT ERP's	AV ERP	EVA 1998	EVA 1997	EVA 1996	EVA 1995	EVA 1994
BARLOWS		-54.34	-232.05	-296.85	-359.62	-1147.50
BATSA		61.99	11.23	6.08	-0.67	-37.90
CORPGRO		-15.28	-0.03	260.74	-17.31	-12.14
KAIROS		-16.12	-20.92	-16.54	-38.42	-65.87
LENCO		-13.83	-6.83	-18.84	-0.77	10.16
METJE-&-Z		-4.34	-3.91	-9.61	-0.91	-1.24
MT-EAGLE		-4.51	-5.10	-3.00	-2.52	
RICHEMONT		-31.11	-50.04	-123.32	62.75	89.49
Av. for group without ERP's		-9.69	-38.46	-25.17	-44.68	-166.43

GROUP WITH ERP's	AV ERP	EVA 1998	EVA 1997	EVA 1996	EVA 1995	EVA 1994
A-V-I	30	-340.72	-248.47	-218.12	-109.05	-159.09
LIONMATCH	47	-16.07	-15.75	-20.95	-24.82	-16.26
REMBR-BEH	27	-1180.40	-1171.50	-921.96	-612.86	-490.86
REMGRO	31	-1404.10	-1360.40	-1069.50	-751.44	-608.28
SABVEST	12	-37.10	-31.73	-12.74	-11.76	-10.44
TEGKOR	31	-1138.00	-1138.70	-896.21	-588.71	-472.17
TIB	31	-1137.90	-1135.20	-893.48	-586.17	-468.57
Av. for group with ERP's		-750.61	-728.82	-576.14	-383.54	-317.95

JSE SECTOR 51

GROUP WITHOUT ERP's	AV ERP	ROC 1998	ROC 1997	ROC 1996	ROC 1995	ROC 1994
FEDICS		30.20				
MOLOPE		60.44				
PARAMED		93.14				
REBHOLD		38.25	25.16			
SENTRY		91.18	24.43	24.25	-8.60	3.45
SERVEST		6.05	16.21	17.89	27.33	12.62
Av. for group without ERP's		53.21	21.93	21.07	9.37	8.04

GROUP WITH ERP's	AV ERP	ROC 1998	ROC 1997	ROC 1996	ROC 1995	ROC 1994
BIDVEST	18	18.52	16.88	23.68	22.39	19.96
ENSERV	56	5.37		24.14		
WACO	13	19.49	10.39	12.86	-12.03	5.40
Av. for group with ERP's		14.46	13.64	20.23	5.18	12.68

JSE SECTOR 51 (continued)

GROUP WITHOUT ERP's	AV ERP	ROA 1998	ROA 1997	ROA 1996	ROA 1995	ROA 1994
FEDICS		28.83				
MOLOPE		45.69				
PARAMED		59.90				
REBHOLD		25.45	17.29			
SENTRY		35.16	16.06	14.89	8.31	7.11
SERVEST		-1.15	3.64	16.54	21.03	17.02
Av. for group without ERP's		32.31	12.33	15.72	14.67	12.07

GROUP WITH ERP's	AV ERP	ROA 1998	ROA 1997	ROA 1996	ROA 1995	ROA 1994
BIDVEST	18	16.21	14.53	18.59	19.10	18.14
ENSERV	56	13.67		23.89		
WACO	13	14.35	7.05	8.42	8.77	8.73
Av. for group with ERP's		14.74	10.79	16.97	13.94	13.44

GROUP WITHOUT ERP's	AV ERP	ROE 1998	ROE 1997	ROE 1996	ROE 1995	ROE 1994
FEDICS		30.20				
MOLOPE		64.61				
PARAMED		B				
REBHOLD		259.65	741.83			
SENTRY		B	41.42	34.73	-13.60	5.17
SERVEST		6.65	18.23	21.69	38.95	17.51
Av. for group without ERP's		90.28	267.16	28.21	12.68	11.34

GROUP WITH ERP's	AV ERP	ROE 1998	ROE 1997	ROE 1996	ROE 1995	ROE 1994
BIDVEST	18	19.55	19.42	30.80	31.44	28.45
ENSERV	56	6.14		34.69		
WACO	13	20.55	11.96	16.36	-35.19	27.52
Av. for group with ERP's		15.41	15.69	27.28	-1.88	27.99

JSE SECTOR 51 (continued)

GROUP WITHOUT ERP's	AV ERP	EVA 1998	EVA 1997	EVA 1996	EVA 1995	EVA 1994
FEDICS						
MOLOPE						
PARAMED						
REBHOLD		11.93				
SENTRY		-3.32	-0.18	5.32	2.29	-0.80
SERVEST		-15.83	-5.39	-1.56	-0.17	-0.93
Av. for group without ERP's		-2.41	-2.79	1.88	1.06	-0.87

GROUP WITH ERP's	AV ERP	EVA 1998	EVA 1997	EVA 1996	EVA 1995	EVA 1994
BIDVEST	18	-76.60	-85.20	11.90	-35.66	-49.90
ENSERV	56	17.19	13.36			
WACO	13	60.09	-48.98	-32.22	-28.32	-39.16
Av. for group with ERP's		0.23	-40.27	-10.16	-31.99	-44.53

JSE SECTOR 52

GROUP WITHOUT ERP's	AV ERP	ROC 1998	ROC 1997	ROC 1996	ROC 1995	ROC 1994
AWETHU		26.58				
BEVCON		8.69	8.50	8.87	7.78	6.47
FORTUNE		14.75	22.60	24.41	23.77	
KWV-BEL		7.91	7.62	7.62	6.09	3.67
Av. for group without ERP's		14.48	12.91	13.63	12.55	5.07

GROUP WITH ERP's	AV ERP	ROC 1998	ROC 1997	ROC 1996	ROC 1995	ROC 1994
ABI	27	24.79	19.32	19.14	22.83	20.89
DISTIL	28	17.92	19.68	17.50	15.00	12.65
SAB	36	11.65	20.43	19.55	16.38	13.42
SFW	27	12.01	15.59	14.62	9.51	6.83
Av. for group with ERP's		16.59	18.76	17.70	15.93	13.45

JSE SECTOR 52 (continued)

GROUP WITHOUT ERP's	AV ERP	ROA 1998	ROA 1997	ROA 1996	ROA 1995	ROA 1994
AWETHU		26.30				
BEVCON		8.17	8.01	8.36	7.39	6.19
FORTUNE		18.84	27.56	31.79	28.91	
KWV-BEL		7.51	7.25	7.27	6.14	5.53
Av. for group without ERP's		15.21	14.27	15.81	14.15	5.86

GROUP WITH ERP's	AV ERP	ROA 1998	ROA 1997	ROA 1996	ROA 1995	ROA 1994
ABI	27	23.32	19.54	17.73	21.78	21.28
DISTIL	28	21.12	20.76	20.51	18.96	19.92
SAB	36	16.00	18.44	18.41	17.37	16.15
SFW	27	13.67	16.94	17.83	13.16	10.37
Av. for group with ERP's		18.53	18.92	18.62	17.82	16.93

GROUP WITHOUT ERP's	AV ERP	ROE 1998	ROE 1997	ROE 1996	ROE 1995	ROE 1994
AWETHU		42.98				
BEVCON		8.69	8.50	8.87	7.78	6.47
FORTUNE		14.76	22.63	24.47	23.83	
KWV-BEL		7.91	7.62	7.62	6.09	3.67
Av. for group without ERP's		18.59	12.92	13.65	12.57	5.07

GROUP WITH ERP's	AV ERP	ROE 1998	ROE 1997	ROE 1996	ROE 1995	ROE 1994
ABI	27	24.94	19.39	19.14	22.83	21.18
DISTIL	28	20.34	19.83	17.69	15.20	12.87
SAB	36	14.26	24.74	25.13	21.75	18.23
SFW	27	13.62	15.94	15.12	9.97	7.26
Av. for group with ERP's		18.29	19.98	19.27	17.44	14.89

GROUP WITHOUT ERP's	AV ERP	EVA 1998	EVA 1997	EVA 1996	EVA 1995	EVA 1994
AWETHU						
BEVCON		-184.18	-196.04	-184.30	-175.99	-189.62
FORTUNE		3.86	2.03	2.05		
KWV-BEL		-55.05	-59.68	-58.90	-56.41	-56.06
Av. for group without ERP's		-78.46	-84.56	-80.38	-116.20	-122.84

JSE SECTOR 52 (continued)

GROUP WITH ERP's	AV ERP	EVA 1998	EVA 1997	EVA 1996	EVA 1995	EVA 1994
ABI	27	113.48	64.77	32.86	25.07	20.02
DISTIL	28	27.03	9.11	-10.64	-19.16	-19.88
SAB	36	1131.79	982.63	1047.33	666.07	409.61
SFW	27	-25.40	-4.49	-17.80	-40.04	-52.16
Av. for group with ERP's		311.73	263.01	262.94	157.99	89.40

JSE SECTOR 53

GROUP WITHOUT ERP's	AV ERP	ROC 1998	ROC 1997	ROC 1996	ROC 1995	ROC 1994
CULTEL		9.68	22.43	31.61	33.29	35.07
DON		-46.35	-9.18	8.37	-3.92	
KAROS		-28.16	4.86	3.15	2.36	-0.56
KING		35.16	29.43			
LESRNET		14.60	27.11	20.39	28.82	18.88
MONEX		12.33	13.94	-9.50	-27.01	4.91
MORIBO		8.71	-26.52	21.82	88.28	-15.11
NANDOS		46.16	87.46			
OAKFLDS		-9.32	-18.43	-16.88	-41.92	-73.58
OHAGANS		43.33				
SAIL		6.04				
SISA		17.40	15.64	16.57	14.73	14.56
SPUR		56.81	74.49	97.58	145.54	267.60
SPURHLD		62.66	95.35	113.10	201.41	458.16
STEERS		51.46	71.76	82.12	38.72	
STOCHOT		6.80	4.66			
TEREXKO		48.41	8.94			
Av. for group without ERP's		19.75	26.80	33.48	43.66	78.88

GROUP WITH ERP's	AV ERP	ROC 1998	ROC 1997	ROC 1996	ROC 1995	ROC 1994
CITYLDG	14	11.96	12.93	14.86	12.76	9.92
CULLINAN	22	21.73	-112.59	-2.18	-18.33	-26.66
KERSAF	21	28.39	13.36	15.01	17.12	16.27
TOURVST	14	50.22	53.88			
Av. for group with ERP's		28.08	-8.11	9.23	3.85	-0.16

JSE SECTOR 53 (continued)

GROUP WITHOUT ERP's	AV ERP	ROA 1998	ROA 1997	ROA 1996	ROA 1995	ROA 1994
CULTEL		9.34	20.88	17.58	22.41	18.88
DON		-9.24	0.01	11.30	5.89	
KAROS		2.12	4.39	5.63	5.86	3.14
KING		25.31	27.62			
LESRNET		19.87	22.15	21.49	26.31	19.14
MONEX		11.80	14.35	-4.66	3.42	10.85
MORIBO		5.75	-6.20	12.71	13.41	1.21
NANDOS		40.72	26.74			
OAKFLDS		-0.79	-10.05	-10.81	-30.80	-26.15
OHAGANS		30.80				
SAIL		16.28				
SISA		23.05	20.88	22.72	14.49	14.25
SPUR		63.40	71.21	82.13	98.78	102.32
SPURHLD		64.50	73.45	83.11	103.03	107.12
STEERS		44.96	54.87	55.41	41.49	
STOCHOT		10.11	8.14			
TEREXKO		3.19	10.50			
Av. for group without ERP's		21.25	22.60	26.96	27.66	27.86

GROUP WITH ERP's	AV ERP	ROA 1998	ROA 1997	ROA 1996	ROA 1995	ROA 1994
CITYLDG	14	18.13	20.16	24.62	23.49	20.29
CULLINAN	22	9.23	-9.09	1.39	-9.79	-4.63
KERSAF	21	17.22	16.40	18.23	17.25	16.39
TOURVST	14	38.72	30.36			
Av. for group with ERP's		20.83	14.46	14.75	10.32	10.68

GROUP WITHOUT ERP's	AV ERP	ROE 1998	ROE 1997	ROE 1996	ROE 1995	ROE 1994
CULTEL		11.88	22.57	34.44	37.26	38.79
DON		-51.25	-11.77	12.53	-6.47	
KAROS		-53.74	6.08	3.86	2.94	-0.69
KING		41.45	32.71			
LESRNET		18.88	38.34	30.66	37.02	24.76
MONEX		12.47	16.86	-15.81	-33.58	5.72
MORIBO		8.76	-26.52	27.34	281.82	B
NANDOS		98.99	B			
OAKFLDS		-13.82	-23.38	-16.88	-41.92	-73.58
OHAGANS		10243.36				

JSE SECTOR 53 (continued)

GROUP WITHOUT ERP's (continued)	AV ERP	ROE 1998	ROE 1997	ROE 1996	ROE 1995	ROE 1994
SAIL		B				
SISA		20.38	16.72	18.04	18.26	18.53
SPUR		56.81	74.49	97.58	145.54	267.60
SPURHLD		62.83	101.05	145.62	683.58	B
STEERS		121.02	82.68	95.19	43.02	
STOCHOT		8.75	5.98			
TEREXKO		63.83	11.32			
Av. for group without ERP's		665.66	24.80	39.32	106.13	40.16

GROUP WITH ERP's	AV ERP	ROE 1998	ROE 1997	ROE 1996	ROE 1995	ROE 1994
CITYLDG	14	18.41	21.33	29.91	32.14	35.05
CULLINAN	22	22.07	-112.79	-2.18	-21.59	-35.42
KERSAF	21	30.71	13.84	15.73	19.44	19.22
TOURVST	14	51.18	54.56			
Av. for group with ERP's		30.59	-5.77	14.49	10.00	6.28

GROUP WITHOUT ERP's	AV ERP	EVA 1998	EVA 1997	EVA 1996	EVA 1995	EVA 1994
CULTEL		-3.31	-0.42	0.42	0.54	0.06
DON		-54.07	-18.78	-7.42	-1.97	-2.73
KAROS		-44.60	-37.58	-32.53	-29.78	-34.84
KING		-1.75				
LESRNET		9.77	18.83	1.40	3.54	
MONEX		-19.44	-7.66	-17.34	-13.35	-6.73
MORIBO		-12.03	-6.04	-1.40	0.95	-1.70
NANDOS		10.43				
OAKFLDS		-2.04	-3.35	-4.36	-7.08	-1.43
OHAGANS						
SAIL		-0.38	-0.05	-0.08	-0.03	-0.02
SISA		46.90	-36.06	-114.54	0.28	0.87
SPUR		8.64	8.72	7.74	6.60	5.57
SPURHLD		9.18	8.42	7.57	6.42	5.94
STEERS		1.69	4.75	3.04		
STOCHOT		-7.12				
TEREXKO		-19.57				
Av. for group without ERP's		-4.86	-5.77	-13.13	-3.08	-3.50

JSE SECTOR 53 (continued)

GROUP WITH ERP's	AV ERP	EVA 1998	EVA 1997	EVA 1996	EVA 1995	EVA 1994
CITYLDG	14	-10.16	-6.18	-1.49	3.18	0.36
CULLINAN	22	-0.98	-59.81	-16.77	-74.35	-49.47
KERSAF	21	-269.37	-246.38	-256.39	-113.90	-129.96
TOURVST	14	8.75				
Av. for group with ERP's		-67.94	-104.12	-91.55	-61.69	-59.69

JSE SECTOR 54

GROUP WITHOUT ERP's	AV ERP	ROC 1998	ROC 1997	ROC 1996	ROC 1995	ROC 1994
BATECOR		11.96	7.79	-42.44	31.29	
CERAMIC		19.70	16.76	13.72	15.49	10.40
CONCOR		19.42	18.46	22.83	25.27	22.47
ED-LBATE		16.73	10.90	3.68	42.92	26.44
G5HOLD		15.36	8.56	9.82	13.45	1.71
GOLDSTEIN		0.00	15.21	22.48	5.87	1.27
HOWDEN		15.31	26.17	35.76		
L-T-A		15.67	24.40	23.83	18.77	18.33
MINGRAN		-24.65	-5.63	-6.78	-37.37	-10.57
OZZ		13.55	14.97	12.11	25.10	11.34
S&SHOLD		-10.98	8.94	11.85	11.75	13.87
STOCKS		-11.63	9.47	10.17	11.74	13.86
TOCO		-778.50	-404.77	10.04	12.60	12.27
Av. for group without ERP's		-53.70	-19.14	9.77	14.74	11.04

JSE SECTOR 54 (continued)

GROUP WITH ERP's	AV ERP	ROC 1998	ROC 1997	ROC 1996	ROC 1995	ROC 1994
ALEXNDR	36	14.95	42.43	24.25	26.07	17.26
BASREAD	18	60.47	57.18	29.46	-61.99	-126.04
BATEPRO	32	30.43	31.00	87.89	30.17	13.28
BUILDMAX	14	-5.57	13.33			
CEMENCO	14	-18.35	-23.32	2.94	4.65	-2.46
CLYDE	23	5.30	6.25	4.12	11.04	18.69
FRALEX	14	14.74	41.90	23.77	25.64	17.16
GRINAKER	23	19.92	15.88			
GROUP-5	21	15.37	8.56	9.83	13.45	1.72
M&R-HLD	25	16.75	-2.20	13.69	13.44	10.90
MASONITE	51	6.11	11.44	12.12	13.73	10.22
PORTHLD	30	14.62	15.73	18.96	22.57	19.95
PPC	53	17.42	17.11	18.59	20.20	17.20
SHARIND	18	17.91		26.42	23.70	18.45
WBHO	24	31.36	25.87	27.44	11.65	17.65
YORKCOR	31	2.93	6.94	-11.51	14.38	6.92
Av. for group with ERP's		15.27	17.87	20.57	12.05	2.92

GROUP WITHOUT ERP's	AV ERP	ROA 1998	ROA 1997	ROA 1996	ROA 1995	ROA 1994
BATECOR		7.86	4.57	0.25	9.89	
CERAMIC		16.93	15.12	14.52	13.29	9.72
CONCOR		11.80	11.34	11.04	11.71	12.15
ED-LBATE		8.41	5.46	5.42	7.27	10.25
G5HOLD		8.39	4.94	5.43	5.95	6.01
GOLDSTEIN		0.00	14.84	21.82	5.74	1.25
HOWDEN		17.63	23.00	18.94		
L-T-A		10.46	9.79	9.56	10.05	9.30
MINGRAN		-13.84	5.80	7.06	1.96	-0.67
OZZ		17.55	17.50	17.02	15.45	15.45
S&SHOLD		6.79	6.09	9.38	8.75	6.45
STOCKS		6.98	6.27	9.55	8.75	6.45
TOCO		16.19	4.01	10.94	15.87	14.83
Av. for group without ERP's		8.86	9.90	10.84	9.56	8.29

JSE SECTOR 54 (continued)

GROUP WITH ERP's	AV ERP	ROA 1998	ROA 1997	ROA 1996	ROA 1995	ROA 1994
ALEXNDR	36	18.01	12.87	14.13	15.77	15.98
BASREAD	18	17.21	13.19	6.14	-7.11	-14.00
BATEPRO	32	6.35	5.88	11.40	15.69	7.94
BUILDMAX	14	-1.20	13.13			
CEMENCO	14	-3.95	-3.37	7.31	6.94	3.24
CLYDE	23	6.07	7.49	7.26	8.34	11.26
FRALEX	14	18.01	12.89	14.09	15.76	15.97
GRINAKER	23	9.03	7.66			
GROUP-5	21	8.40	4.95	5.44	5.95	6.01
M&R-HLD	25	8.51	2.32	10.31	12.29	11.32
MASONITE	51	7.07	11.32	12.55	17.72	13.85
PORTHLD	30	19.24	14.79	20.20	26.56	23.72
PPC	53	17.52	19.26	19.63	22.95	22.83
SHARIND	18	17.23		24.46	23.64	18.30
WBHO	24	14.69	11.68	13.35	4.72	6.99
YORKCOR	31	8.31	7.38	-3.96	10.13	14.34
Av. for group with ERP's		10.66	9.43	11.59	12.81	11.27

GROUP WITHOUT ERP's	AV ERP	ROE 1998	ROE 1997	ROE 1996	ROE 1995	ROE 1994
BATECOR		13.03	8.26	-42.98	31.85	
CERAMIC		19.70	16.76	13.72	15.49	11.13
CONCOR		21.85	20.60	24.80	26.51	23.36
ED-LBATE		17.16	11.10	3.71	43.31	26.81
G5HOLD		15.91	8.92	10.29	14.16	1.81
GOLDSTEIN		0.00	15.21	22.48	5.87	1.27
HOWDEN		15.36	26.32	36.04		
L-T-A		17.61	28.92	26.24	19.69	20.62
MINGRAN		-28.84	-6.45	-9.63	-55.58	-15.61
OZZ		15.66	17.99	14.89	29.77	13.99
S&SHOLD		-15.34	12.81	17.50	15.58	17.32
STOCKS		-16.64	13.90	15.28	15.57	17.31
TOCO		B	-A	14.32	17.02	17.31
Av. for group without ERP's		6.29	14.53	11.28	14.94	12.30

JSE SECTOR 54 (continued)

GROUP WITH ERP's	AV ERP	ROE 1998	ROE 1997	ROE 1996	ROE 1995	ROE 1994
ALEXNDR	36	16.22	46.38	27.93	29.45	19.35
BASREAD	18	65.50	74.64	55.74	-101.36	-138.60
BATEPRO	32	30.74	31.51	89.90	30.17	13.41
BUILDMAX	14	-6.46	13.39			
CEMENCO	14	-19.09	-23.44	2.95	4.67	-2.49
CLYDE	23	5.39	6.40	4.24	11.25	19.02
FRALEX	14	15.98	45.74	27.31	28.91	19.20
GRINAKER	23	22.23	18.06			
GROUP-5	21	15.91	8.92	10.30	14.17	1.81
M&R-HLD	25	21.45	-2.91	17.36	16.75	14.00
MASONITE	51	6.53	11.71	12.20	13.82	10.41
PORTHLD	30	17.62	18.55	23.11	33.20	35.49
PPC	53	19.81	18.04	18.99	20.89	17.82
SHARIND	18	21.11		31.91	39.25	104.67
WBHO	24	32.15	26.64	29.05	12.44	18.92
YORKCOR	31	4.22	11.26	-18.02	18.98	9.55
Av. for group with ERP's		16.83	20.33	23.78	12.33	10.18

GROUP WITHOUT ERP's	AV ERP	EVA 1998	EVA 1997	EVA 1996	EVA 1995	EVA 1994
BATECOR		-2.05	-11.30	-28.17		
CERAMIC		17.29	6.73	2.91	8.57	4.52
CONCOR		14.59	5.59	4.41	8.06	7.22
ED-LBATE		11.35	-19.57	-10.45	-4.25	20.05
G5HOLD		16.64	-5.13	-13.20	-9.08	-37.64
GOLDSTEIN		-10.63	-2.27	0.72	-4.29	-4.95
HOWDEN		10.36	21.84			
L-T-A		72.40	103.62	41.56	43.24	45.61
MINGRAN		-4.68	-3.95	-3.58	-4.97	-10.69
OZZ		-1.51	-2.47	-9.42	-6.62	-6.79
S&SHOLD		-80.64	-87.49	-35.14	-21.09	-7.79
STOCKS		-69.36	-76.89	-27.72	-19.75	-6.43
TOCO		-5.86	278.31	-37.26	-15.06	-11.17
Av. for group without ERP's		-2.47	15.92	-9.61	-2.29	-0.73

JSE SECTOR 54 (continued)

GROUP WITH ERP's	AV ERP	EVA 1998	EVA 1997	EVA 1996	EVA 1995	EVA 1994
ALEXNDR	36	54.50	-8.67	3.14	0.83	10.27
BASREAD	18	32.10	18.47	16.91	-8.42	-11.33
BATEPRO	32	13.01	11.69	5.90	0.94	0.29
BUILDMAX	14	-8.01				
CEMENCO	14	-8.24	-18.21	-0.44	0.54	-0.54
CLYDE	23	-1.85	-1.23	-0.93	0.30	0.94
FRALEX	14	53.97	-8.26	3.13	0.95	10.55
GRINAKER	23	57.00				
GROUP-5	21	18.72	-2.71	-10.62	-7.01	-34.75
M&R-HLD	25	-135.35	-706.38	-299.38	-201.93	-219.07
MASONITE	51	-4.83	-5.56	-6.84	-4.86	-4.65
PORTHLD	30	21.26	-14.01	22.15	35.78	40.50
PPC	53	-21.55	-77.47	-90.78	-48.87	-130.00
SHARIND	18	6.62	15.67	20.51	1.16	
WBHO	24	23.86	17.69	0.75	0.64	2.28
YORKCOR	31	-1.09	-2.58	-7.70	-0.45	1.55
Av. for group with ERP's		6.26	-55.83	-24.59	-16.46	-25.69

JSE SECTOR 56

GROUP WITHOUT ERP's	AV ERP	ROC 1998	ROC 1997	ROC 1996	ROC 1995	ROC 1994
AFROX		14.44	15.19	16.41	14.57	13.32
ENERGY		-13.43	7.26	46.75		
FRANSAF		-5.08	30.62	17.59	27.36	17.45
SPANJAARD		34.13	27.45	19.63	4.40	7.18
STRAND		7.26	-2.44	-22.01	3.75	-91.63
Av. for group without ERP's		7.46	15.62	15.67	12.52	-13.42

GROUP WITH ERP's	AV ERP	ROC 1998	ROC 1997	ROC 1996	ROC 1995	ROC 1994
AECI	81	-4.95	10.85	17.41	9.01	20.78
CHEMSERVE	40	28.84	35.60	25.42	25.05	20.81
OMNIA	40	18.42	26.27	25.89	19.85	21.61
POLIFIN	65	29.16	34.21	33.25	23.39	
SASOL	61	17.09	22.54	21.56	18.45	16.28
SONDOR	15	20.61	18.93	28.91	22.28	-9.91
Av. for group with ERP's		18.20	24.73	25.41	19.67	13.91

JSE SECTOR 56 (continued)

GROUP WITHOUT ERP's	AV ERP	ROA 1998	ROA 1997	ROA 1996	ROA 1995	ROA 1994
AFROX		19.48	19.43	19.65	18.44	17.66
ENERGY		6.18	10.29	5.90		
FRANSAF		0.10	20.12	15.50	29.14	15.94
SPANJAARD		20.50	16.88	17.76	5.63	5.36
STRAND		20.78	4.37	-2.45	3.38	-25.18
Av. for group without ERP's		13.41	14.22	11.27	14.15	3.45

GROUP WITH ERP's	AV ERP	ROA 1998	ROA 1997	ROA 1996	ROA 1995	ROA 1994
AECI	81	10.75	11.55	13.39	11.99	10.78
CHEMSERVE	40	22.82	21.25	21.38	20.88	18.93
OMNIA	40	17.50	17.72	18.37	15.18	15.99
POLIFIN	65	30.58	35.36	30.37	32.69	
SASOL	61	18.40	25.59	24.39	22.45	21.56
SONDOR	15	23.93	20.50	32.83	27.58	23.21
Av. for group with ERP's		20.66	22.00	23.46	21.80	18.09

GROUP WITHOUT ERP's	AV ERP	ROE 1998	ROE 1997	ROE 1996	ROE 1995	ROE 1994
AFROX		18.88	18.99	19.88	17.99	16.57
ENERGY		-15.85	9.67	62.78		
FRANSAF		-5.08	30.62	17.59	27.36	17.45
SPANJAARD		47.93	39.04	24.71	5.20	8.23
STRAND		10.79	-3.42	-26.43	4.40	-1001.72
Av. for group without ERP's		11.33	18.98	19.71	13.74	-239.87

GROUP WITH ERP's	AV ERP	ROE 1998	ROE 1997	ROE 1996	ROE 1995	ROE 1994
AECI	81	-5.73	11.57	20.03	10.79	25.66
CHEMSERVE	40	30.83	38.49	27.16	27.43	24.39
OMNIA	40	22.68	31.25	32.23	23.33	24.55
POLIFIN	65	29.16	36.04	40.56	31.66	
SASOL	61	19.16	25.83	25.82	23.32	21.68
SONDOR	15	30.25	33.07	59.98	65.29	-36.58
Av. for group with ERP's		21.06	29.38	34.30	30.30	11.94

JSE SECTOR 56 (continued)

GROUP WITHOUT ERP's	AV ERP	EVA 1998	EVA 1997	EVA 1996	EVA 1995	EVA 1994
AFROX		117.91	90.49	55.31	43.83	31.06
ENERGY		15.16	47.39			
FRANSAF		0.87	8.99	-0.72	3.04	0.53
SPANJAARD		1.49	1.11	0.60	-0.17	-0.22
STRAND		1.86	-3.16	-5.60	-2.23	-18.71
Av. for group without ERP's		27.46	28.96	12.40	11.12	3.17

GROUP WITH ERP's	AV ERP	EVA 1998	EVA 1997	EVA 1996	EVA 1995	EVA 1994
AECI	81	-255.49	-220.27	-216.39	-242.70	-280.26
CHEMSERVE	40	10.16	-0.34	6.26	8.37	1.24
OMNIA	40	6.93	23.02	13.54	5.59	7.96
POLIFIN	65	217.67	386.33	-16.34		
SASOL	61	-197.14	102.00	-94.62	-233.97	-531.91
SONDOR	15	3.51	2.07	2.72	2.78	2.39
Av. for group with ERP's		-35.73	48.80	-50.81	-91.99	-160.12

JSE SECTOR 58

GROUP WITHOUT ERP's	AV ERP	ROC 1998	ROC 1997	ROC 1996	ROC 1995	ROC 1994
ADONIS		6.12	7.27	8.10	20.65	5.74
AMMGROUP		13.36				
BOLWEAR		9.69	5.78	7.34	31.61	7.60
BURLINGTN		-11.05	-5.37	0.26	2.27	1.97
GUBINGS		-4.46	3.73	-15.66	10.94	8.96
ROMATEX		2.12	-13.82	0.36	7.86	11.97
TOLARAM		-26.57	-19.35	-11.77	13.84	13.34
Av. for group without ERP's		-1.54	-3.63	-1.90	14.53	8.26

JSE SECTOR 58 (continued)

GROUP WITH ERP's	AV ERP	ROC 1998	ROC 1997	ROC 1996	ROC 1995	ROC 1994
COASTAL	22	5.63	10.15	-7.53		
CONFRAM	44	6.69	5.55	7.90	8.90	7.57
CONSHU	18	6.89	2.16	16.83	18.16	12.43
FRAME	45	6.58	5.39	7.63	8.56	7.25
GLODINA	35	-9.59	6.52	1.99	14.82	14.85
NINIAN	32	2.58	11.26	10.85	12.17	13.28
PALS	14	3.42	5.72	24.84	30.31	21.38
SEARDEL	29	9.08	4.13	12.43	15.61	10.90
UNISPIN	20	-29.14	-18.05	0.72	13.78	9.95
Av. for group with ERP's		0.24	3.65	8.41	15.29	12.20

GROUP WITHOUT ERP's	AV ERP	ROA 1998	ROA 1997	ROA 1996	ROA 1995	ROA 1994
ADONIS		10.63	14.00	12.95	17.73	6.38
AMMGROUP		17.31				
BOLWEAR		10.60	6.75	10.04	13.50	10.66
BURLINGTN		-1.95	7.52	10.70	8.69	7.13
GUBINGS		5.68	7.38	4.10	11.23	6.87
ROMATEX		1.95	-4.66	0.48	7.81	13.79
TOLARAM		-9.54	-4.24	-1.53	12.60	12.11
Av. for group without ERP's		4.95	4.46	6.12	11.93	9.49

GROUP WITH ERP's	AV ERP	ROA 1998	ROA 1997	ROA 1996	ROA 1995	ROA 1994
COASTAL	22	2.61	14.38	-7.63		
CONFRAM	44	8.06	4.29	8.09	9.95	4.22
CONSHU	18	10.24	5.77	18.88	18.76	17.25
FRAME	45	7.97	4.24	8.00	9.85	4.19
GLODINA	35	0.00	8.36	6.01	13.81	12.56
NINIAN	32	6.04	12.46	11.18	14.25	15.74
PALS	14	2.03	8.77	23.69	24.80	14.66
SEARDEL	29	7.39	6.83	13.96	14.25	14.53
UNISPIN	20	-10.77	-6.48	2.91	12.02	9.10
Av. for group with ERP's		3.73	6.51	9.45	14.71	11.53

JSE SECTOR 58 (continued)

GROUP WITHOUT ERP's	AV ERP	ROE 1998	ROE 1997	ROE 1996	ROE 1995	ROE 1994
ADONIS		6.91	8.22	9.67	23.25	5.75
AMMGROUP		13.88				
BOLWEAR		9.72	5.80	7.38	31.84	7.73
BURLINGTN		-42.96	-13.47	0.48	3.81	3.01
GUBINGS		-4.64	3.88	-16.55	11.49	8.99
ROMATEX		2.12	-13.82	0.36	7.86	12.02
TOLARAM		-138.09	-41.31	-15.53	17.99	18.25
Av. for group without ERP's		-21.87	-8.45	-2.37	16.04	9.29

GROUP WITHOUT ERP's	AV ERP	ROE 1998	ROE 1997	ROE 1996	ROE 1995	ROE 1994
COASTAL	22	9.15	18.62	-8.05		
CONFRAM	44	6.98	5.71	7.90	8.90	7.67
CONSHU	18	7.30	2.32	18.12	19.78	14.56
FRAME	45	6.87	5.55	7.63	8.56	7.35
GLODINA	35	-10.26	7.18	2.30	16.56	15.27
NINIAN	32	2.58	11.27	11.41	13.52	14.92
PALS	14	3.96	6.73	28.74	34.14	24.29
SEARDEL	29	10.16	4.61	14.45	21.19	15.52
UNISPIN	20	0.00	-22.13	0.84	14.39	10.99
Av. for group with ERP's		4.08	4.43	9.26	17.13	13.82

GROUP WITHOUT ERP's	AV ERP	EVA 1998	EVA 1997	EVA 1996	EVA 1995	EVA 1994
ADONIS		0.49	0.78	0.83	-0.13	-0.07
AMMGROUP						
BOLWEAR		-0.96	-4.32	-3.88	-0.02	-0.75
BURLINGTN		-1.83	-1.64	-1.02	-0.85	-0.80
GUBINGS		-13.00	-10.31	-23.72	-3.64	-4.26
ROMATEX		-17.14	-55.59	-41.25	-27.25	-12.78
TOLARAM		-11.44	-7.59	-6.75	1.86	1.44
Av. for group without ERP's		-7.31	-13.11	-12.63	-5.01	-2.87

JSE SECTOR 58 (continued)

GROUP WITH ERP's	AV ERP	EVA 1998	EVA 1997	EVA 1996	EVA 1995	EVA 1994
COASTAL	22	-34.20	-0.34			
CONFRAM	44	-82.70	-98.71	-84.18	-46.75	-99.87
CONSHU	18	-21.66	-30.55	0.75	1.16	-1.34
FRAME	45	20.77	-31.88	-20.32	12.86	-34.25
GLODINA	35	-12.98	-3.02	-7.25	-0.13	0.97
NINIAN	32	5.32	11.46	8.75	10.68	10.88
PALS	14	-1.77	0.35	2.79	3.66	0.73
SEARDEL	29	-66.87	-123.82	-35.93	-4.81	-1.68
UNISPIN	20	-49.56	-48.86	-8.11	11.99	13.49
Av. for group with ERP's		-27.07	-36.15	-17.94	-1.42	-13.88

JSE SECTOR 60

GROUP WITHOUT ERP's	AV ERP	ROC 1998	ROC 1997	ROC 1996	ROC 1995	ROC 1994
ALTECH		28.12	18.29	1.04	11.91	11.82
ALTRON		20.83	16.03	7.85	16.97	15.69
DELTA		31.94	29.88	32.20	24.45	24.93
FMCOTEC		-103.54	-36.54	-18.60	-10.83	19.65
MACADAM		12.96	28.20	36.91	34.47	20.11
NEI-AFR		12.69	8.18	20.23	14.82	8.16
NEIHOLD		12.60	8.07	20.03	14.81	8.16
POWTECH		19.90	13.31	8.43	13.96	18.64
REUNERT		23.55	4.51	18.38	25.25	29.70
SEARTEC		14.47	14.59	18.63	15.39	
STANTRN		63.09	-119.85	-60.52	-16.28	6.31
TMX		-7.01	-4.26	5.17	18.26	16.30
UNIHOLD		18.19		20.46	30.64	25.05
VENTRON		21.00	16.02	7.74	16.84	15.56
Av. for group without ERP's		12.06	-0.27	8.43	15.05	16.93

GROUP WITH ERP's	AV ERP	ROC 1998	ROC 1997	ROC 1996	ROC 1995	ROC 1994
BICAF	18	21.21	1.93	-5.85	9.92	26.93
CONTROL	16	9.70	11.10	30.43	35.94	16.70
GRINTEK	24	20.59	12.74	51.78	26.72	27.01
LOGTEK	14	27.69	12.04	35.85	21.77	13.60
SETHOLD	35	49.85				
VOLTEX	29	107.35	13.71	13.82	12.80	5.47
Av. for group with ERP's		39.40	10.30	25.21	21.43	17.94

JSE SECTOR 60 (continued)

GROUP WITHOUT ERP's	AV ERP	ROA 1998	ROA 1997	ROA 1996	ROA 1995	ROA 1994
ALTECH		19.91	17.07	12.21	15.65	15.47
ALTRON		18.27	16.14	13.25	16.40	15.52
DELTA		31.88	29.45	24.62	24.84	23.27
FMCOTEC		-11.24	-1.56	-4.10	0.72	11.57
MACADAM		14.61	30.73	37.68	27.79	14.41
NEI-AFR		11.60	7.59	10.73	9.56	10.48
NEIHOLD		11.61	7.58	10.73	9.56	10.48
POWTECH		19.34	17.52	11.80	15.28	16.11
REUNERT		18.39	12.24	13.05	16.43	17.56
SEARTEC		14.37	15.11	19.18	17.76	
STANTRN		49.68	0.77	-18.03	1.33	5.69
TMX		-0.83	7.83	2.10	14.15	14.41
UNIHOLD		12.83		15.52	18.86	20.44
VENTRON		18.28	16.16	13.14	16.27	15.46
Av. for group without ERPs		16.34	13.59	11.56	14.61	14.68

GROUP WITH ERP's	AV ERP	ROA 1998	ROA 1997	ROA 1996	ROA 1995	ROA 1994
BICAF	18	13.40	4.65	-1.55	9.15	28.75
CONTROL	16	2.53	12.41	20.39	19.62	12.05
GRINTEK	24	11.59	10.35	13.70	16.70	17.16
LOGTEK	14	20.17	15.73	21.16	24.64	17.74
SETHOLD	35	30.41				
VOLTEX	29	16.00	17.12	16.06	15.34	11.45
Av. for group with ERPs		15.68	12.05	13.95	17.09	17.43

JSE SECTOR 60 (continued)

GROUP WITHOUT ERP's	AV ERP	ROE 1998	ROE 1997	ROE 1996	ROE 1995	ROE 1994
ALTECH		29.95	18.68	1.05	11.91	11.83
ALTRON		23.64	17.45	7.90	17.01	15.77
DELTA		31.94	30.03	32.81	25.38	26.52
FMCOTEC		-145.34	-40.25	-21.52	-13.70	24.51
MACADAM		12.96	28.97	39.83	36.88	22.04
NEI-AFR		12.69	8.18	20.24	15.14	8.51
NEIHOLD		12.60	8.07	20.04	15.13	8.51
POWTECH		20.12	13.32	8.45	14.03	18.86
REUNERT		23.67	4.56	18.73	25.74	29.94
SEARTEC		15.63	15.41	18.70	15.51	
STANTRN		64.41	-121.80	-61.65	-16.67	6.49
TMX		-7.59	-4.34	5.23	18.26	16.30
UNIHOLD		0.00		21.62	32.91	28.03
VENTRON		23.83	17.35	7.75	16.88	15.64
Av. for group without ERP's		8.47	-0.34	8.51	15.32	17.92

GROUP WITH ERP's	AV ERP	ROE 1998	ROE 1997	ROE 1996	ROE 1995	ROE 1994
BICAF	18	21.86	2.06	-6.09	9.92	26.93
CONTROL	16	10.43	11.70	31.46	37.91	18.11
GRINTEK	24	23.31	13.51	55.81	29.05	27.37
LOGTEK	14	50.36	13.78	42.77	34.76	29.52
SETHOLD	35	B				
VOLTEX	29	137.01	19.23	21.85	26.68	16.66
Av. for group with ERP's		48.59	12.06	29.16	27.66	23.72

JSE SECTOR 60 (continued)

GROUP WITHOUT ERP's	AV ERP	EVA 1998	EVA 1997	EVA 1996	EVA 1995	EVA 1994
ALTECH		19.35	8.83	-28.84	-30.40	-27.90
ALTRON		34.64	-1.37	-57.91	-13.70	-27.21
DELTA		32.12	37.56	15.04	13.15	15.31
FMCOTEC		-10.44	-6.03	-11.09	-5.54	2.49
MACADAM		-6.60	0.41	1.87	2.33	0.10
NEI-AFR		-2.55	-15.16	-10.20	-10.99	-8.19
NEIHOLD		8.56	-2.00	-1.62	-2.16	1.57
POWTECH		14.10	4.33	-47.01	-15.38	-11.00
REUNERT		130.61	61.51	37.66	65.01	49.31
SEARTEC		-5.50	-5.16	-6.52		
STANTRN		-0.39	-12.11	-66.48	-18.02	-11.86
TMX		-3.17	2.14	-4.34	1.16	2.61
UNIHOLD		1.97	8.18	6.25	8.78	10.69
VENTRON		103.09	52.55	4.88	35.45	14.40
Av. for group without ERP's		22.56	9.55	-12.02	2.28	0.79

GROUP WITH ERP's	AV ERP	EVA 1998	EVA 1997	EVA 1996	EVA 1995	EVA 1994
BICAF	18	7.72	-4.27	-20.39	-2.65	8.65
CONTROL	16	-2.47	-2.23	2.13	6.52	0.30
GRINTEK	24	191.99	-31.01	-10.64	12.34	24.53
LOGTEK	14	-2.84	-1.10	1.19	0.39	0.08
SETHOLD	35					
VOLTEX	29	62.28	-9.89	-25.63	-58.31	-52.84
Av. for group with ERP's		51.34	-9.70	-10.67	-8.34	-3.86

JSE SECTOR 61

GROUP WITHOUT ERP's	AV ERP	ROC 1998	ROC 1997	ROC 1996	ROC 1995	ROC 1994
ABRAXAS		24.71				
BILLCAD			25.52			
CCHOLD		17.68				
COMPAREX		128.45	21.74	23.54	55.85	
CONNECT		28.61				
DATATEC		30.39	16.56	11.67	16.21	
DIDATA		47.20	40.07	35.91	40.38	23.65
ELEXIR		12.98				
FINTECH		17.30	24.90	34.26	36.22	31.12
IMPHOLD		4.50		0.00	0.00	18.50
INFINITI		59.00				
ITI-TECH		25.19				
IXCHANGE		14.19				
MBTECH		B				
MGX		24.72	27.76	88.48		
MMWTECH		8.68				
MUSTEK		49.71	38.85			
SFTLINE		49.71	28.23			
SPESCOM		26.68	-17.50	17.31	11.24	3.97
SPICER			-46.37	-10.75	-5.29	23.13
UCS		14.42				
USKO		45.17	78.61	56.11	46.28	24.15
YTHRK		25.99				
Av. for group without ERP's		32.76	21.67	28.50	25.11	20.75

GROUP WITH ERP's	AV ERP	ROC 1998	ROC 1997	ROC 1996	ROC 1995	ROC 1994
KTL	30	10.39	10.29	40.92	23.49	28.22
SILTEK	21	24.48	16.26	65.81	29.66	26.73
Av. for group with ERPs		17.44	13.28	53.37	26.58	27.48

JSE SECTOR 61 (continued)

GROUP WITHOUT ERP's	AV ERP	ROA 1998	ROA 1997	ROA 1996	ROA 1995	ROA 1994
ABRAXAS		18.12				
BILLCAD			18.39			
CCHOLD		18.52				
COMPAREX		35.09	15.48	16.90	23.31	
CONNECT		16.72				
DATATEC		14.69	13.55	20.35	18.68	
DIDATA		27.66	29.38	25.75	28.51	25.42
ELEXIR		12.91				
FINTECH		18.63	21.68	19.43	20.46	18.20
IMPHOLD		5.69		0.00	0.00	17.14
INFINITI		22.41				
ITI-TECH		20.77				
IXCHANGE		13.65				
MBTECH		17.97				
MGX		26.03	31.95	36.43		
MMWTECH		7.63				
MUSTEK		28.11	18.74			
SFTLINE		33.27	15.91			
SPESCOM		20.56	12.99	12.83	11.05	8.41
SPICER			0.62	7.90	26.34	16.02
UCS		19.24				
USKO		16.88	19.78	26.83	31.58	18.83
YTHRK		26.33				
Av. for group without ERP's		20.04	18.04	18.49	19.99	17.34

GROUP WITH ERP's	AV ERP	ROA 1998	ROA 1997	ROA 1996	ROA 1995	ROA 1994
KTL	30	7.36	8.15	10.93	13.53	12.71
SILTEK	21	11.64	13.23	15.80	20.01	18.71
Av. for group with ERP's		9.50	10.69	13.37	16.77	15.71

JSE SECTOR 61 (continued)

GROUP WITHOUT ERP's	AV ERP	ROE 1998	ROE 1997	ROE 1996	ROE 1995	ROE 1994
ABRAXAS		25.39				
BILLCAD			B			
CCHOLD		19.02				
COMPAREX		135.93	22.01	23.80	58.64	
CONNECT		30.21				
DATATEC		82.83	50.25	31.22	48.26	
DIDATA		55.74	43.30	35.91	40.38	23.65
ELEXIR		13.21				
FINTECH		31.49	41.34	36.88	39.70	33.07
IMPHOLD		4.98		0.00	0.00	18.50
INFINITI		61.37				
ITI-TECH		46.92				
IXCHANGE		B				
MBTECH		B				
MGX		28.10	27.92	88.48		
MMWTECH		9.80				
MUSTEK		51.65	40.26			
SFTLINE		50.11	29.07			
SPESCOM		28.53	-18.04	18.08	11.93	4.18
SPICER			-68.23	-14.39	-10.21	182.17
UCS		17.04				
USKO		115.77	84.15	56.29	46.98	24.43
YTHRK		28.37				
Av. for group without ERP's		44.02	25.20	30.70	29.46	47.67

GROUP WITH ERP's	AV ERP	ROE 1998	ROE 1997	ROE 1996	ROE 1995	ROE 1994
KTL	30	11.02	10.79	43.31	25.33	29.68
SILTEK	21	24.84	16.43	70.12	32.65	27.15
Av. for group with ERP's		17.93	13.61	56.72	28.99	28.42

JSE SECTOR 61 (continued)

GROUP WITHOUT ERP's	AV ERP	EVA 1998	EVA 1997	EVA 1996	EVA 1995	EVA 1994
ABRAXAS						
BILLCAD		-4.74	-0.08			
CCHOLD						
COMPAREX		129.61	-20.84	-5.83		
CONNECT						
DATATEC		-18.16	-2.66	-0.77		
DIDATA		128.61	25.77	2.99	-0.56	0.12
ELEXIR						
FINTECH		28.87	6.45	15.57	24.63	27.47
IMPHOLD						
INFINITI						
ITI-TECH						
IXCHANGE						
MBTECH						
MGX		1.98	0.76			
MMWTECH						
MUSTEK		42.64				
SFTLINE		3.14				
SPESCOM		-4.80	-8.14	-6.86	-6.25	-6.60
SPICER		-19.08	-18.04	-5.69	2.86	-0.20
UCS						
USKO		-3.18	6.04	11.66	31.17	2.27
YTHRK						
Av. for group without ERP's		25.90	-1.19	1.58	10.37	4.61

GROUP WITH ERP's	AV ERP	EVA 1998	EVA 1997	EVA 1996	EVA 1995	EVA 1994
KTL	30	121.28	-47.37	-14.85	15.05	18.14
SILTEK	21	-0.01	-17.74	-9.15	13.21	8.49
Av. for group with ERP's		60.64	-32.56	-12.00	14.13	13.32

JSE SECTOR 66

GROUP WITHOUT ERP's	AV ERP	ROC 1998	ROC 1997	ROC 1996	ROC 1995	ROC 1994
AFBRAND		21.64				
CONAFEX		0.75	-1.10	4.16	2.15	11.54
DELCORP		19.17	13.47	16.76	17.35	26.31
DELHOLD		19.17	12.04	16.37	17.35	26.31
HLH		0.31	4.27	0.02	0.50	7.83
LANGEBERG		9.68	11.46	17.87	14.17	15.60
LIFESTYLE		34.23	14.22			
OTK		12.04	9.95			
RAINBOW		-28.42	-21.93	-23.45	3.43	0.64
SOVFOOD		16.43	7.11	20.48		
Av. for group without ERP's		10.50	5.50	7.46	9.16	14.71

GROUP WITH ERP's	AV ERP	ROC 1998	ROC 1997	ROC 1996	ROC 1995	ROC 1994
CADSWEP	46	18.04	22.97	20.32	21.73	20.42
CGS-FOOD	20	19.33	21.60	21.20	16.32	10.02
CGSMITH	21	18.97	21.43	20.75	18.87	13.05
CHOICE	14	-141.27	-54.67	3.99	25.41	32.52
CROOKES	29	18.63	10.41	21.31	11.08	4.62
DELFOOD	29	19.17	21.61	17.64	17.29	26.57
I-&-J	20	12.03	12.29	6.42	10.36	10.90
ILLOVO	32	30.33	26.21	15.77	12.17	8.94
KOLOSUS	24	-14.62	-17.72	0.39	10.20	
NAMFISH	18	76.53	-26.80	-23.53	5.52	17.18
NAMSEA	18	-8.02	-0.73	-11.22	25.86	18.89
NATCHIX	26	17.44	14.04	16.94		
OCFISH	36	39.12	42.21	32.83	35.65	26.17
SEAHARV	24	23.04	22.83	25.11	22.97	19.97
TIGR-OATS	24	19.12	20.05	22.86	17.96	11.74
TONGAAT	31	16.33	17.06	22.82	12.85	6.56
WBHOLD	25	-4.45	-13.00	13.92	5.52	13.53
Av. for group with ERP's		9.40	8.22	13.38	16.86	16.07

JSE SECTOR 66 (continued)

GROUP WITHOUT ERP's	AV ERP	ROA 1998	ROA 1997	ROA 1996	ROA 1995	ROA 1994
AFBRAND		16.08				
CONAFEX		1.90	2.12	5.43	3.77	7.79
DELCORP		15.33	6.80	13.24	11.30	14.97
DELHOLD		15.33	6.84	13.08	11.30	14.97
HLH		4.79	6.50	7.64	6.88	11.77
LANGEBERG		11.49	13.88	18.22	21.49	16.17
LIFESTYLE		34.02	15.13			
OTK		17.91	15.51			
RAINBOW		-10.17	-7.69	-5.34	5.87	4.72
SOVFOOD		18.87	10.06	21.49		
Av. for group without ERP's		12.56	7.68	10.54	10.10	11.73

GROUP WITH ERP's	AV ERP	ROA 1998	ROA 1997	ROA 1996	ROA 1995	ROA 1994
CADSWEP	46	19.49	19.39	19.55	19.34	19.18
CGS-FOOD	20	19.84	17.60	17.22	16.28	12.99
CGSMITH	21	19.27	18.37	18.19	18.10	14.99
CHOICE	14	-34.33	-16.26	2.86	15.96	12.23
CROOKES	29	11.58	13.49	12.06	11.92	5.40
DELFOOD	29	15.34	10.32	13.68	11.38	15.50
I-&-J	20	11.71	12.33	9.82	12.32	10.48
ILLOVO	32	21.92	18.91	15.13	13.87	7.64
KOLOSUS	24	5.35	5.25	12.38	9.51	
NAMFISH	18	22.36	-4.68	-23.98	9.31	16.31
NAMSEA	18	3.47	9.66	-4.96	20.23	17.02
NATCHIX	26	18.46	15.25	17.64		
OCFISH	36	31.66	32.57	30.30	28.92	23.62
SEAHARV	24	27.81	28.88	29.70	31.33	24.20
TIGR-OATS	24	19.14	17.89	18.27	16.97	14.65
TONGAAT	31	13.23	14.63	16.30	12.59	8.22
WBHOLD	25	-0.23	-9.97	13.86	5.26	13.58
Av. for group with ERP's		13.30	11.98	12.82	15.83	14.40

JSE SECTOR 66(continued)

GROUP WITHOUT ERP's	AV ERP	ROE 1998	ROE 1997	ROE 1996	ROE 1995	ROE 1994
AFBRAND		21.71				
CONAFEX		0.83	-1.26	4.84	2.50	13.18
DELCORP		62.53	37.33	38.01	35.12	51.14
DELHOLD		62.53	36.96	37.14	35.12	51.14
HLH		0.36	5.87	0.04	0.78	10.53
LANGEBERG		9.68	11.47	17.87	14.17	17.41
LIFESTYLE		36.45	15.28			
OTK		21.69	19.14			
RAINBOW		-28.42	-21.93	-24.34	3.63	0.67
SOVFOOD		22.31	9.31	25.83		
Av. for group without ERP's		20.97	12.46	14.20	15.22	24.01

GROUP WITH ERP's	AV ERP	ROE 1998	ROE 1997	ROE 1996	ROE 1995	ROE 1994
CADSWEP	46	20.69	25.40	22.42	24.33	22.00
CGS-FOOD	20	20.90	23.26	23.42	18.86	11.86
CGSMITH	21	20.13	22.79	22.37	20.89	14.79
CHOICE	14	-620.32	-145.66	8.58	51.36	69.29
CROOKES	29	18.63	10.41	21.31	11.08	4.62
DELFOOD	29	62.56	59.88	39.96	34.92	53.01
I-&-J	20	14.65	15.39	8.12	13.38	14.90
ILLOVO	32	32.05	28.26	18.18	14.70	10.91
KOLOSUS	24	-18.16	-26.87	0.62	15.71	
NAMFISH	18	128.30	-77.07	-47.96	8.81	22.51
NAMSEA	18	-11.22	-0.90	-13.19	28.55	20.66
NATCHIX	26	22.10	16.54	19.50		
OCFISH	36	39.46	42.64	33.57	37.21	27.27
SEAHARV	24	23.22	22.97	25.23	23.16	20.27
TIGR-OATS	24	21.02	21.85	25.34	20.91	14.04
TONGAAT	31	19.84	18.38	23.16	13.40	7.20
WBHOLD	25	-4.45	-13.00	13.92	5.52	13.53
Av. for group with ERP's		-12.39	2.60	14.39	21.42	21.79

JSE SECTOR 66 (continued)

GROUP WITHOUT ERP's	AV ERP	EVA 1998	EVA 1997	EVA 1996	EVA 1995	EVA 1994
AFBRAND						
CONAFEX		-4.09	-5.06	-3.12	-2.63	-2.20
DELCORP		-343.36	-546.61	-432.03	-463.08	-401.48
DELHOLD		-229.79	-309.58	-281.63	-309.18	-249.75
HLH		-282.70	-292.62	-278.28	-274.02	-137.38
LANGEBERG		-24.76	-16.57	-6.95	13.63	14.96
LIFESTYLE		11.98				
OTK		46.81				
RAINBOW		-360.78	-356.03	-307.25	-136.49	-152.02
SOVFOOD		5.11	-1.85			
Av. for group without ERP's		-131.29	-218.33	-218.21	-195.30	-154.65

GROUP WITH ERP's	AV ERP	EVA 1998	EVA 1997	EVA 1996	EVA 1995	EVA 1994
CADSWEP	46	61.04	19.41	9.82	23.07	13.87
CGS-FOOD	20	624.79	171.70	13.56	194.25	65.76
CGSMITH	21	722.96	359.51	179.08	337.45	170.09
CHOICE	14	-236.89	-86.80	-13.62	2.69	-0.51
CROOKES	29	-2.20	-2.38	-3.78	-0.58	-6.94
DELFOOD	29	-244.50	-390.28	-435.06	-472.56	-397.55
I-&-J	20	-8.63	-0.28	-48.70	-20.49	-15.28
ILLOVO	32	147.36	-22.00	-60.48	-63.77	-70.72
KOLOSUS	24	-74.51	-67.91	-25.12		
NAMFISH	18	7.55	-10.58	-28.64	0.50	2.91
NAMSEA	18	-10.97	-2.90	-28.91	11.14	9.38
NATCHIX	26	6.87	3.15			
OCFISH	36	53.52	51.77	33.07	29.78	12.50
SEAHARV	24	29.33	20.91	17.60	22.65	10.94
TIGR-OATS	24	249.57	177.75	20.09	171.67	92.12
TONGAAT	31	-130.57	-227.69	-234.87	-308.98	-391.13
WBHOLD	25	-5.08	-9.59	0.20	-2.20	0.53
Av. for group with ERP's		69.98	-0.95	-37.86	-5.03	-33.60

JSE SECTOR 68

GROUP WITHOUT ERP's	AV ERP	ROC 1998	ROC 1997	ROC 1996	ROC 1995	ROC 1994
AMAPS		19.32	27.84			
ANBEECO		4.76	4.11	18.10	16.06	6.87
CEDAGRO		26.89				
DAEWOO		-228.72	-102.32	9.00	15.79	2.32
NUWORLD		14.21	17.59	16.08	16.43	13.18
OMEGA		-39.38	24.34	36.99	-64.05	
CORNICK		-16.45	4.99	9.71	9.86	7.78
Av. for group without ERP's		-31.34	-3.91	17.98	-1.18	7.54

GROUP WITH ERP's	AV ERP	ROC 1998	ROC 1997	ROC 1996	ROC 1995	ROC 1994
FRIDGEM	41	-42.84	18.42	17.94		
Av. for group with ERP's		-42.84	18.42	17.94		

GROUP WITHOUT ERP's	AV ERP	ROA 1998	ROA 1997	ROA 1996	ROA 1995	ROA 1994
AMAPS		9.41	15.94			
ANBEECO		18.22	9.33	19.81	14.85	10.16
CEDAGRO		22.42				
DAEWOO		-31.86	-16.09	16.86	14.06	7.48
NUWORLD		13.71	16.96	14.03	14.45	13.22
OMEGA		-15.22	18.94	15.90	-5.63	
CORNICK		0.66	5.36	10.19	11.27	12.08
Av. for group without ERP's		2.48	8.41	15.36	9.80	10.74

GROUP WITH ERP's	AV ERP	ROA 1998	ROA 1997	ROA 1996	ROA 1995	ROA 1994
FRIDGEM	41	-15.84	14.08	18.99		
Av. for group with ERP's		-15.84	14.08	18.99		

JSE SECTOR 68 (continued)

GROUP WITHOUT ERP's	AV ERP	ROE 1998	ROE 1997	ROE 1996	ROE 1995	ROE 1994
AMAPS		23.20	27.84			
ANBEECO		4.76	4.11	18.46	16.67	7.08
CEDAGRO		27.81				
DAEWOO		-247.49	-108.02	9.31	16.23	2.38
NUWORLD		15.99	19.88	19.62	21.35	17.78
OMEGA		-39.38	24.34	90.03	B	
CORNICK		-17.13	5.16	10.23	10.56	8.05
Av. for group without ERP's		-33.18	-4.45	29.53	16.20	8.82

GROUP WITH ERP's	AV ERP	ROE 1998	ROE 1997	ROE 1996	ROE 1995	ROE 1994
FRIDGEM	41	-53.05	20.61	18.60		
Av. for group with ERP's		-53.05	20.61	18.60		

GROUP WITHOUT ERP's	AV ERP	EVA 1998	EVA 1997	EVA 1996	EVA 1995	EVA 1994
AMAPS		3.73	6.49			
ANBEECO		0.78	-1.43	1.33	-0.42	-2.11
CEDAGRO						
DAEWOO		-54.26	-51.73	-3.87	-2.81	-4.07
NUWORLD		-7.20	0.09	-2.20	-0.16	-0.73
OMEGA		-36.17	0.60	-0.04	-2.68	-1.28
CORNICK		-31.50	-28.06	-11.48	-5.99	-2.39
Av. for group without ERP's		-20.77	-12.34	-3.25	-2.41	-2.12

GROUP WITH ERP's	AV ERP	EVA 1998	EVA 1997	EVA 1996	EVA 1995	EVA 1994
FRIDGEM	41	-65.53	0.45			
Av. for group with ERP's		-65.53	0.45			

JSE SECTOR 71

GROUP WITHOUT ERP's	AV ERP	ROC 1998	ROC 1997	ROC 1996	ROC 1995	ROC 1994
ALEXWYT		-14.60	1.41	0.71	6.10	5.56
ARIES		19.98	35.79	22.63	26.10	23.67
ASTRAPAK		18.57				
BOWCALF		23.68	20.20	17.89	20.01	31.28
COPI		8.07	4.71	7.37	11.54	12.54
GUNDLE		2.06	14.43	20.92	17.58	4.68
PARAGON		25.14				
Av. for group without ERP's		11.84	15.31	13.90	16.27	15.55

GROUP WITH ERP's	AV ERP	ROC 1998	ROC 1997	ROC 1996	ROC 1995	ROC 1994
COATES	25	13.25	47.52	16.92	19.32	17.82
HARWILL	22	-27.39	-6.52	12.42	13.03	11.83
MALBAK	15	8.44	6.00	15.48	15.24	12.63
NAMPAK	40	18.84	20.39	22.72	23.78	21.12
PROSPUR	38	6.73				
TRNPACO	19	30.57	14.02	12.42	7.35	-5.46
Av. for group with ERP's		8.41	16.28	15.99	15.74	11.59

GROUP WITHOUT ERP's	AV ERP	ROA 1998	ROA 1997	ROA 1996	ROA 1995	ROA 1994
ALEXWYT		-0.96	7.18	6.08	7.05	3.36
ARIES		17.64	18.72	27.39	31.20	32.58
ASTRAPAK		20.02				
BOWCALF		28.96	29.32	26.51	28.47	33.60
COPI		2.73	4.23	5.37	6.82	6.63
GUNDLE		5.84	13.10	15.47	13.17	8.86
PARAGON		26.56				
Av. for group without ERP's		14.40	14.51	16.16	17.34	17.01

GROUP WITH ERP's	AV ERP	ROA 1998	ROA 1997	ROA 1996	ROA 1995	ROA 1994
COATES	25	14.00	12.84	16.86	17.81	17.74
HARWILL	22	-15.11	-3.68	12.92	23.44	19.93
MALBAK	15	9.84	5.44	13.95	13.32	12.37
NAMPAK	40	18.30	20.47	21.25	23.20	20.58
PROSPUR	38	10.72				
TRNPACO	19	23.39	14.26	13.53	8.73	2.89
Av. for group with ERP's		10.19	9.87	15.70	17.30	14.70

JSE SECTOR 71 (continued)

GROUP WITHOUT ERP's	AV ERP	ROE 1998	ROE 1997	ROE 1996	ROE 1995	ROE 1994
ALEXWYT		-19.67	1.97	1.03	7.80	6.25
ARIES		21.87	39.63	23.27	27.38	26.01
ASTRAPAK		56.53				
BOWCALF		28.89	26.86	26.69	27.13	34.50
COPI		8.17	4.79	7.55	11.80	12.64
GUNDLE		2.66	17.67	26.80	22.61	6.19
PARAGON		27.10				
Av. for group without ERP's		17.94	18.18	17.07	19.34	17.12

GROUP WITH ERP's	AV ERP	ROE 1998	ROE 1997	ROE 1996	ROE 1995	ROE 1994
COATES	25	13.26	47.60	16.97	19.40	17.91
HARWILL	22	-40.55	-8.53	14.23	13.77	12.50
MALBAK	15	9.39	6.50	16.66	16.34	13.31
NAMPAK	40	19.19	21.12	23.32	24.31	21.96
PROSPUR	38	8.91				
TRNPACO	19	36.47	17.07	15.13	8.95	-6.55
Av. for group with ERP's		7.78	16.75	17.26	16.55	11.83

GROUP WITHOUT ERP's	AV ERP	EVA 1998	EVA 1997	EVA 1996	EVA 1995	EVA 1994
ALEXWYT		-5.95	-0.29	-2.09	-0.95	-1.71
ARIES		-0.90	-0.79	0.69	1.76	1.31
ASTRAPAK						
BOWCALF		4.94	3.56	2.75	0.88	1.56
COPI		-40.59	-37.42	-37.04	-24.92	-23.14
GUNDLE		-3.96	-0.07	1.94	1.82	0.38
PARAGON						
Av. for group without ERP's		-9.29	-7.00	-6.75	-4.28	-4.32

GROUP WITH ERP's	AV ERP	EVA 1998	EVA 1997	EVA 1996	EVA 1995	EVA 1994
COATES	25	-8.32	-5.02	3.94	5.11	3.59
HARWILL	22	-13.62	-4.52	0.39	1.83	1.27
MALBAK	15	-70.48	-182.47	-25.18	-73.37	-79.69
NAMPAK	40	147.43	181.64	161.93	138.34	113.19
PROSPUR	38					
TRNPACO	19	2.22	0.61	-0.01	0.10	-1.00
Av. for group with ERP's		11.45	-1.95	28.21	14.40	7.47

JSE SECTOR 74

GROUP WITHOUT ERP's	AV ERP	ROC 1998	ROC 1997	ROC 1996	ROC 1995	ROC 1994
ALIANCE		31.53	27.29			
BEIGE		20.40				
CARSON		27.21	17.85			
CLINICS		9.70	2.01	5.20	5.51	6.36
MACMED		17.51	29.19	17.87	15.36	22.30
MEDCLIN		17.86	15.86	18.31	11.47	9.70
MEDEX		-7.49	13.16	5.91	4.97	
NETCARE		9.50	3.21			
PRESMED		10.07	16.81	16.51	15.42	16.11
SA-DRUG		15.19	19.76	13.11	13.83	13.51
Av. for group without ERP's		15.15	16.13	12.82	11.09	13.60

GROUP WITH ERP's	AV ERP	ROC 1998	ROC 1997	ROC 1996	ROC 1995	ROC 1994
ADCOCK	23	37.79	34.03	27.34	33.81	29.01
ASPEN	14	-46.06	5.52	21.40	76.05	19.98
GEN-OPTIC	14	12.86	11.82	8.46	3.98	7.18
Av. for group with ERP's		1.53	17.12	19.07	37.95	18.72

GROUP WITHOUT ERP's	AV ERP	ROA 1998	ROA 1997	ROA 1996	ROA 1995	ROA 1994
ALIANCE		22.04	20.44			
BEIGE		20.27				
CARSON		24.49	15.63			
CLINICS		16.40	9.93	16.06	15.15	15.66
MACMED		18.18	15.66	15.30	13.36	14.03
MEDCLIN		17.58	19.88	22.82	18.57	17.78
MEDEX		3.11	-1.40	7.67	6.21	
NETCARE		16.22	6.15			
PRESMED		12.80	18.91	19.00	17.56	21.01
SA-DRUG		14.53	14.25	13.57	12.39	12.94
Av. for group without ERP's		16.56	13.27	15.74	13.87	16.28

GROUP WITH ERP's	AV ERP	ROA 1998	ROA 1997	ROA 1996	ROA 1995	ROA 1994
ADCOCK	23	40.98	34.33	25.13	30.53	30.20
ASPEN	14	-2.39	-7.71	18.61	40.77	19.06
GEN-OPTIC	14	13.85	14.44	13.59	9.01	11.46
Av. for group with ERP's		17.48	13.69	19.11	26.77	20.24

JSE SECTOR 74 (continued)

GROUP WITHOUT ERP's	AV ERP	ROE 1998	ROE 1997	ROE 1996	ROE 1995	ROE 1994
ALIANCE		39.79	46.51			
BEIGE		25.11				
CARSON		29.47	23.03			
CLINICS		13.86	4.12	22.10	28.04	36.81
MACMED		17.79	29.96	18.50	15.73	22.82
MEDCLIN		19.48	18.35	27.37	18.75	16.24
MEDEX		-7.60	13.27	5.95	5.01	
NETCARE		13.66	4.82			
PRESMED		10.82	18.44	18.91	18.62	23.13
SA-DRUG		16.29	22.26	15.85	15.68	13.91
Av. for group without ERP's		17.87	20.08	18.11	16.97	22.58

GROUP WITH ERP's	AV ERP	ROE 1998	ROE 1997	ROE 1996	ROE 1995	ROE 1994
ADCOCK	23	38.12	34.82	27.95	33.81	29.01
ASPEN	14	-47.45	6.48	25.30	79.35	20.65
GEN-OPTIC	14	14.79	15.13	12.63	5.87	10.47
Av. for group with ERP's		1.82	18.81	21.96	39.68	20.04

GROUP WITHOUT ERP's	AV ERP	EVA 1998	EVA 1997	EVA 1996	EVA 1995	EVA 1994
ALIANCE		1.31				
BEIGE						
CARSON		1.84				
CLINICS		-17.00	-94.70	-7.89	18.02	3.18
MACMED		-4.11	-1.85	-0.64	-0.75	-0.30
MEDCLIN		-16.18	-14.90	17.95	-4.53	1.12
MEDEX		-43.04	-40.82	-29.34	-11.24	-5.21
NETCARE		27.79				
PRESMED		-14.80	-4.95	0.99	-2.54	-1.46
SA-DRUG		17.63	14.19	2.50	-11.53	-4.52
Av. for group without ERP's		-5.17	-23.84	-2.74	-2.10	-1.20

GROUP WITH ERP's	AV ERP	EVA 1998	EVA 1997	EVA 1996	EVA 1995	EVA 1994
ADCOCK	23	190.84	112.69	-13.98	40.29	36.47
ASPEN	14	-17.69	-14.43	-2.55	1.06	-0.19
GEN-OPTIC	14	1.82	1.19	1.07	0.17	0.87
Av. for group with ERP's		58.32	33.15	-5.15	13.84	12.38

JSE SECTOR 80

GROUP WITHOUT ERP's	AV ERP	ROC 1998	ROC 1997	ROC 1996	ROC 1995	ROC 1994
ACREM		5.93	3.84	9.07	1.36	0.67
AF-&-OVER		12.09	9.60	9.84	10.60	10.33
AMLAC		-15.82	22.96	37.11		
AUTOQIP		23.03	25.26	22.89	20.83	14.95
BEARMAN		14.60	20.35	26.65	29.34	24.22
BOUMAT		-8.18	2.99	3.23	18.65	8.18
BRANDCO		26.52	175.17	2491.57	2160.00	2682.35
BUSBY		20.31				
CASHBIL		13.54	12.53	2.55	20.18	30.32
CHET		10.63				
CITYHLD			-38.49	-10.30	42.72	18.53
CMH		21.36	18.83	38.20	45.65	23.08
ESIC		2.22		-4.38	-0.05	
FASHAF		15.91	19.21	14.60	15.40	8.37
FOSCHINI		14.36	12.62	19.71	20.60	20.66
GLOHOLD		-92.46	11.89	27.62	21.34	
HEAVEN		38.71	32.40			
HICORL		8.75	8.76		14.86	16.52
HOMECHOIC		28.61	28.17	20.21		
HUDACO		17.76	24.44	24.88	24.49	21.84
ILIAD		21.97				
INMINS		17.94	56.78	9.11	8.50	8.53
INVICTA		30.56	48.07	56.87	32.90	
ITLTILE		20.93	20.58	18.91	12.15	10.61
LA-STORE		85.12	138.93	163.92	-23.69	-27.17
LEFIC		0.00	0.00	0.00	0.02	0.01
MATHOMO		-74.56	31.95	29.56		
METCASH		26.15	26.46	22.15	28.89	31.22
MIDAS		21.16	19.39	20.03	22.81	11.50
NICTUS		-29.74	-0.29	6.41	10.55	17.20
NUCLICKS		17.25	16.60	18.97	16.44	10.12
PACIFIC		-4.34	2.63	-41.03	10.96	5.63
PEPGRO		12.43	15.89	5.88	9.49	9.90
PEPKOR		16.36	20.85	11.09	17.99	16.93
PICKNPAY		26.03	28.03	22.53	18.49	25.02
PIKWIK		103.47	162.81	132.13	101.20	119.68
PROFURN		26.80	34.34	25.84	16.59	22.20
RAG		14.48	10.65			
RELYANT		1.48	5.93	5.94	4.40	1.18

JSE SECTOR 80 (continued)

GROUP WITHOUT ERP's (continued)	AV ERP	ROC 1998	ROC 1997	ROC 1996	ROC 1995	ROC 1994
RENAISAN		21.25				
RETCORP		31.83	34.04	30.43	26.96	-41.35
REX-TRUE		11.46	9.06	9.08	9.75	10.16
SHOPRIT		32.45	28.59	14.65	23.48	14.34
SPECLTY		15.90	13.38	20.41	16.86	16.49
STORECO		17.14	12.24	18.24	21.75	19.89
TELTRON		14.41	14.01	15.82		
TRUWTHS		22.69				
UNIGRO		19.44	9.68	8.81	7.14	4.03
VALAUTO		5.27	6.01	7.94	9.49	9.73
VALCAR		5.39	6.10	8.10	9.94	10.23
WETHLYS		15.64				
WINBEL		8.85	50.00	14.19	11.93	7.91
WINHOLD		8.67	49.30	13.98	11.74	7.78
WOOLIES		35.01	19.45			
WOOLTRU		33.40	17.21	22.93	28.77	24.42
Av. for group without ERP's		14.63	27.07	76.14	69.32	82.72

GROUP WITH ERP's	AV ERP	ROC 1998	ROC 1997	ROC 1996	ROC 1995	ROC 1994
EDGARS	29	11.22	17.84	20.29	20.99	23.15
ELLERINE	24	16.12	20.30	18.83	18.88	23.36
JDGROUP	17	15.74	10.84	15.63	15.82	26.99
MCRTAIL	12	-33.59	16.32	24.28	29.17	22.85
PRIMATOY	15	16.56				
Av. for group with ERP's		5.21	16.33	19.76	21.22	24.09

JSE SECTOR 80 (continued)

GROUP WITHOUT ERP's	AV ERP	ROA 1998	ROA 1997	ROA 1996	ROA 1995	ROA 1994
ACREM		9.46	8.29	10.61	8.87	11.12
AF-&-OVER		13.84	12.55	12.82	12.33	9.89
AMLAC		-1.11	18.81	26.47		
AUTOQIP		18.04	17.89	16.73	16.38	15.03
BEARMAN		16.23	21.33	24.17	25.77	22.61
BOUMAT		-2.35	7.21	6.61	12.32	5.52
BRANDCO		21.89	19.20	232.66	246.23	166.09
BUSBY		18.60				
CASHBIL		8.79	8.84	4.05	12.46	16.13
CHET		13.32				
CITYHLD			0.82	9.57	29.17	17.67
CMH		18.58	18.73	25.63	27.84	16.05
ESIC		6.17		1.99	1.92	
FASHAF		16.13	15.31	16.57	13.10	9.34
FOSCHINI		18.37	17.26	25.95	26.85	26.27
GLOHOLD		1.71	13.05	23.78	19.87	
HEAVEN		34.85	32.46			
HICORL		10.50	12.33		10.68	12.11
HOMECHOIC		26.34	25.08	20.57		
HUDACO		16.02	22.00	22.88	19.21	19.17
ILIAD		14.83				
INMINS		12.35	10.41	7.78	9.11	10.62
INVICTA		21.60	25.01	25.30	20.50	
ITLTILE		20.63	19.18	15.50	12.40	9.84
LA-STORE		42.70	32.82	4.61	-22.58	-12.73
LEFIC		0.00	0.00	0.00	0.02	0.01
MATHOMO		12.38	26.67	22.24		
METCASH		13.74	11.82	10.68	9.77	8.29
MIDAS		16.79	15.43	13.83	13.22	11.36
NICTUS		-1.93	6.99	9.44	10.34	9.81
NUCLICKS		14.28	14.43	15.19	14.44	11.66
PACIFIC		4.81	10.94	2.77	13.65	10.19
PEPGRO		10.62	13.54	6.07	12.46	11.97
PEPKOR		9.20	11.83	9.49	12.46	11.24
PICKNPAY		13.12	11.99	10.70	9.50	12.85
PIKWIK		67.98	91.45	69.19	54.37	63.07
PROFURN		22.37	24.58	18.95	19.22	16.65
RAG		16.17	15.98			

JSE SECTOR 80 (continued)

GROUP WITHOUT ERP's (continued)	AV ERP	ROA 1998	ROA 1997	ROA 1996	ROA 1995	ROA 1994
RELYANT		10.97	11.67	11.34	8.93	6.84
RENAISAN		18.36				
RETCORP		24.61	29.94	23.59	15.53	2.14
REX-TRUE		12.98	11.79	11.82	11.05	9.13
SHOPRIT		11.34	13.21	10.80	8.31	5.00
SPECLTY		15.22	11.12	20.50	17.36	17.50
STORECO		16.50	12.55	18.17	20.20	17.69
TELTRON		18.23	18.73	16.16		
TRUWTHS		23.53				
UNIGRO		14.45	9.89	9.95	8.48	5.18
VALAUTO		12.39	11.10	9.82	9.00	9.01
VALCAR		12.51	11.16	9.89	9.14	9.18
WETHLYS		20.74				
WINBEL		8.80	11.66	10.80	10.78	9.79
WINHOLD		8.70	11.57	10.66	10.64	9.64
WOOLIES		27.61	16.99			
WOOLTRU		17.22	16.74	18.34	20.47	20.57
Av. for group without ERP's		15.76	16.92	20.10	19.57	16.50

GROUP WITH ERP's	AV ERP	ROA 1998	ROA 1997	ROA 1996	ROA 1995	ROA 1994
EDGARS	29	12.29	18.25	21.88	23.00	24.66
ELLERINE	24	20.49	24.25	23.84	20.56	21.21
JDGROUP	17	17.29	16.51	15.94	15.68	17.35
MCRTAIL	12	14.35	17.79	20.87	26.91	23.91
PRIMATOY	15	14.87				
Av. for group with ERP's		15.86	19.20	20.63	21.54	21.78

JSE SECTOR 80 (continued)

GROUP WITHOUT ERP's	AV ERP	ROE 1998	ROE 1997	ROE 1996	ROE 1995	ROE 1994
ACREM		6.03	3.99	9.58	1.44	0.71
AF-&-OVER		12.09	9.61	9.88	10.68	10.45
AMLAC		-46.07	38.81	39.58		
AUTOQIP		24.51	28.12	26.27	24.13	18.39
BEARMAN		16.45	23.21	28.68	29.41	25.19
BOUMAT		-8.46	3.07	3.33	19.27	8.59
BRANDCO		26.74	175.17	2491.57	2160.00	2682.35
BUSBY		24.93				
CASHBIL		14.87	13.98	2.75	21.28	36.15
CHET		10.73				
CITYHLD			-91.26	-15.75	54.65	32.77
CMH		22.53	20.02	39.69	45.65	23.08
ESIC		B		-6.92	-0.06	
FASHAF		16.42	21.77	20.46	21.11	9.48
FOSCHINI		16.03	15.19	25.61	27.55	26.99
GLOHOLD		-99.39	12.99	30.23	23.81	
HEAVEN		40.92	32.75			
HICORL		9.55	9.33		15.78	18.07
HOMECHOIC		29.13	28.54	20.46		
HUDACO		21.39	30.72	30.38	28.66	24.89
ILIAD		32.54				
INMINS		25.26	121.76	37.26	37.36	41.66
INVICTA		31.51	61.27	89.20	65.53	
ITLTILE		20.93	20.58	18.91	12.15	10.61
LA-STORE		85.33	310.89	B	-51.84	-27.68
LEFIC		0.00	0.00	0.00	0.02	0.01
MATHOMO		-80.40	37.63	39.94		
METCASH		27.15	27.10	22.15	28.89	31.22
MIDAS		21.23	19.61	20.34	23.20	11.82
NICTUS		-37.58	-0.36	7.82	12.84	20.12
NUCLICKS		21.48	21.01	21.58	16.44	10.16
PACIFIC		-5.51	2.91	-44.02	12.33	6.40
PEPGRO		13.55	17.14	7.66	18.44	20.54
PEPKOR		18.85	24.87	14.03	25.04	25.45
PICKNPAY		31.99	33.07	27.22	20.60	25.26
PIKWIK		103.47	162.81	132.13	101.20	119.68
PROFURN		26.90	34.75	27.89	19.42	24.72
RAG		18.70	17.23			

JSE SECTOR 80 (continued)

GROUP WITHOUT ERP's (continued)	AV ERP	ROE 1998	ROE 1997	ROE 1996	ROE 1995	ROE 1994
RELYANT		2.09	9.24	9.70	9.99	3.96
RENAISAN		21.25				
RETCORP		74.88	49.72	32.67	32.15	-51.02
REX-TRUE		11.46	9.08	9.11	9.82	10.29
SHOPRIT		38.02	38.78	19.98	30.29	19.85
SPECLTY		15.92	13.41	21.28	19.02	19.39
STORECO		17.14	12.24	18.24	21.75	19.89
TELTRON		14.41	14.04	15.88		
TRUWTHS		23.85				
UNIGRO		B	10.44	10.13	8.51	5.06
VALAUTO		7.74	8.61	9.66	10.05	10.68
VALCAR		8.01	8.80	9.90	10.55	11.27
WETHLYS		15.99				
WINBEL		11.78	74.56	28.80	27.03	20.20
WINHOLD		11.52	73.12	27.95	26.07	19.32
WOOLIES		0.00	19.68			
WOOLTRU		36.76	19.04	24.63	31.63	27.69
Av. for group without ERP's		15.47	34.36	77.63	72.90	85.99

GROUP WITH ERP's	AV ERP	ROE 1998	ROE 1997	ROE 1996	ROE 1995	ROE 1994
EDGARS	29	12.84	19.73	25.39	28.83	31.74
ELLERINE	24	16.92	20.30	18.83	18.88	23.36
JDGROUP	17	20.75	15.33	25.17	23.65	30.54
MCRTAIL	12	-54.03	26.13	45.82	64.20	63.29
PRIMATOY	15	24.34				
Av. for group with ERP's		4.16	20.37	28.80	33.89	37.23

JSE SECTOR 80 (continued)

GROUP WITHOUT ERP's	AV ERP	EVA 1998	EVA 1997	EVA 1996	EVA 1995	EVA 1994
ACREM		-2.20	-2.64	-1.69	-3.47	-0.48
AF-&-OVER		3.11	-1.94	-3.38	-1.58	-1.04
AMLAC		1.26	0.70			
AUTOQIP		3.39	3.97	2.09	1.66	0.76
BEARMAN		0.04	5.96	5.54	5.39	4.46
BOUMAT		-83.60	-23.80	-20.43	-1.42	-11.94
BRANDCO		-1.07	-0.39	0.56	0.30	0.22
BUSBY						
CASHBIL		14.14	1.56	-3.24	2.52	9.14
CHET						
CITYHLD		-9.90	-12.27	-3.30	3.38	-0.38
CMH		9.41	8.13	13.28	15.37	5.09
ESIC		-2.63	-3.92	-3.58	-0.31	-0.08
FASHAF		17.23	2.59	-0.64	2.68	-3.88
FOSCHINI		22.77	4.51	53.77	48.90	35.32
GLOHOLD		-95.89	-39.47	-14.38		
HEAVEN		3.60				
HICORL		0.52	-0.17	-0.94	-0.31	1.06
HOMECHOIC		10.66	8.93			
HUDACO		17.09	35.63	33.69	13.44	4.39
ILIAD						
INMINS		3.26	2.56	0.26	0.70	0.91
INVICTA		5.59	10.27	10.70	5.52	1.93
ITLTILE		10.22	6.36	3.73	-0.88	0.70
LA-STORE		14.72	7.96	-1.89	-4.42	-3.29
LEFIC		-78.62	-71.50	-60.06	-43.81	-34.14
MATHOMO		4.05	1.80			
METCASH		57.70	61.35	-20.39	10.49	3.80
MIDAS		11.89	9.44	5.88	1.44	3.59
NICTUS		-5.27	-1.25	-0.59		-0.46
NUCLICKS		34.51	31.19	20.43	15.55	8.04
PACIFIC		-4.41	-1.31	-6.57	-0.28	-1.44
PEPGRO		-13.72	-6.00	-42.93	-8.33	-2.21
PEPKOR		299.87	229.26	78.36	97.42	83.46
PICKNPAY		130.74	116.71	132.79	65.99	71.71
PIKWIK		32.04	28.34	29.03	21.47	26.07
PROFURN		-8.44	6.99	5.49	7.69	-1.53
RAG		8.82				

JSE SECTOR 80 (continued)

GROUP WITHOUT ERP's (continued)	AV ERP	EVA 1998	EVA 1997	EVA 1996	EVA 1995	EVA 1994
RELYANT		-60.03	-53.15	-58.36	-49.35	-43.41
RENAISAN						
RETCORP		15.64	1.76	1.51	1.14	-2.44
REX-TRUE		-7.33	-11.48	-12.79	-10.31	-8.31
SHOPRIT		163.59	128.60	83.98	73.54	29.17
SPECLTY		-0.70	-11.76	-4.95	2.49	5.20
STORECO		1.46	-1.02	-0.41	0.95	0.98
TELTRON		14.77	10.49			
TRUWTHS						
UNIGRO		-0.63	-0.19	-0.09	-0.09	-0.43
VALAUTO		0.43	-0.03	0.05	-0.01	0.16
VALCAR		0.20	-0.18	-0.18	-0.22	-0.10
WETHLYS						
WINBEL		-0.77	2.11	2.72	2.93	1.36
WINHOLD		-0.79	2.04	2.61	2.81	1.24
WOOLIES		277.17				
WOOLTRU		230.94	91.95	117.07	136.38	157.69
Av. for group without ERP's		21.32	12.58	8.16	10.38	8.31

GROUP WITH ERP's	AV ERP	EVA 1998	EVA 1997	EVA 1996	EVA 1995	EVA 1994
EDGARS	29	-33.99	59.68	87.82	95.36	88.90
ELLERINE	24	-26.76	11.56	-14.11	-11.09	-3.56
JDGROUP	17	-31.38	-87.75	-13.91	-16.05	-3.85
MCRTAIL	12	-181.31	16.65	191.68	82.49	19.56
PRIMATOY	15					
Av. for group with ERP's		-68.36	0.03	62.87	37.68	25.26

JSE SECTOR 86

GROUP WITHOUT ERP's	AV ERP	ROC 1998	ROC 1997	ROC 1996	ROC 1995	ROC 1994
BOLTONS		9.25	5.63	8.04	20.14	9.27
CARGO		9.20	5.70	8.21	11.68	11.09
COMAIR		32.08				
IMPERIAL		11.67	11.93	12.31	13.87	14.46
LASER		15.90	7.21	-13.64	-0.08	7.08
MAXTYRE		21.71				
METAIR		11.54	21.71	15.25	18.21	14.85
METKOR		12.38	17.11	13.84		-2.07
MICIND		16.17	77.91	36.36	29.74	16.86
MOBILE		4.44	5.32	6.37	5.47	4.25
PUTCO		9.65	1.09	5.84	8.52	15.86
TIWHEEL		15.93	19.78	18.65	27.32	31.86
TOYOTA		5.38	4.99	8.42	11.16	6.01
TRENCOR		15.31	14.46	24.35	8.12	6.21
UNISERV		2.73	3.24	11.61	33.68	33.00
UNITRAN		14.59	10.94	13.19	14.37	15.75
VENTEL		8.57	3.81	-9.08	6.13	12.96
WESCO		5.45	5.34	8.83	8.93	5.16
Av. for group without ERP's		12.33	13.51	10.53	14.48	12.66

GROUP WITH ERP's	AV ERP	ROC 1998	ROC 1997	ROC 1996	ROC 1995	ROC 1994
AVIS	14	24.26	23.67	21.72		
BELL	20	-16.63	6.45	11.97	12.30	
DORBYL	14	15.14	14.99	15.28		-2.28
DUNLOP	10	5.54	2.55	17.58	14.77	16.24
FELTEX	22	2.63	16.66	14.94	15.52	
GRINCOR	33	4.40	7.75	15.74	9.53	11.57
PLATE-GL	24	11.73	30.91	33.92	27.12	28.96
ROADCOR	27	19.17	8.77	12.12	10.92	12.02
SAFREN	21	6.54	10.91	14.07	14.19	13.15
SUPRGRP	14	14.79	22.26	25.82	21.44	13.84
Av. for group with ERP's		8.76	14.49	18.32	15.72	13.36

JSE SECTOR 86

GROUP WITHOUT ERP's	AV ERP	ROA 1998	ROA 1997	ROA 1996	ROA 1995	ROA 1994
BOLTONS		9.51	7.42	8.97	11.44	9.00
CARGO		8.82	8.13	8.19	9.65	8.48
COMAIR		33.79				
IMPERIAL		13.69	11.83	13.03	14.15	15.62
LASER		15.56	12.32	6.05	5.93	9.05
MAXTYRE		18.16				
METAIR		13.68	15.48	16.81	20.29	17.76
METKOR		9.91	11.95	11.62		5.27
MICIND		12.17	11.87	14.46	12.10	7.19
MOBILE		7.55	9.45	10.66	8.97	7.52
PUTCO		7.51	1.37	4.76	11.16	8.97
TIWHEEL		13.82	15.00	17.15	19.12	19.12
TOYOTA		7.38	9.88	13.56	16.53	12.17
TRENCOR		7.72	14.58	17.22	15.23	18.24
UNISERV		2.32	2.51	1.34	18.37	15.72
UNITRAN		12.99	12.45	13.80	12.76	6.30
VENTEL		7.14	5.14	-4.54	7.79	13.88
WESCO		8.18	9.85	12.67	15.14	11.38
Av. for group without ERP's		11.66	9.95	10.36	13.24	11.60

GROUP WITH ERP's	AV ERP	ROA 1998	ROA 1997	ROA 1996	ROA 1995	ROA 1994
AVIS	14	21.46	20.56	17.67		
BELL	20	0.49	10.89	13.56	10.44	
DORBYL	14	12.47	10.23	12.54		5.72
DUNLOP	10	8.38	6.21	12.96	20.21	19.76
FELTEX	22	11.14	15.71	13.89	16.28	
GRINCOR	33	7.85	8.98	9.11	10.13	7.55
PLATE-GL	24	11.82	18.38	19.96	20.56	20.93
ROADCOR	27	22.58	12.93	17.26	14.44	11.50
SAFREN	21	6.92	12.91	14.81	13.97	13.37
SUPRGRP	14	15.62	19.28	26.47	3.17	10.65
Av. for group with ERP's		11.87	13.61	15.82	13.65	12.78

JSE SECTOR 86 (continued)

GROUP WITHOUT ERP's	AV ERP	ROE 1998	ROE 1997	ROE 1996	ROE 1995	ROE 1994
BOLTONS		10.22	6.23	8.75	22.19	10.18
CARGO		11.06	6.86	9.63	13.96	13.04
COMAIR		33.56				
IMPERIAL		13.90	12.77	15.12	20.61	15.66
LASER		22.63	11.85	-25.48	-0.16	14.73
MAXTYRE		24.47				
METAIR		12.42	23.32	15.96	19.12	15.63
METKOR		12.69	17.67	14.85		-2.35
MICIND		19.37	89.88	37.84	33.67	20.85
MOBILE		6.00	7.72	9.90	8.76	6.69
PUTCO		9.65	1.09	5.84	8.52	15.86
TIWHEEL		20.57	22.01	21.92	33.51	36.72
TOYOTA		6.52	5.99	10.12	13.18	7.42
TRENCOR		27.82	19.86	32.62	10.90	8.41
UNISERV		2.73	3.24	13.12	47.61	43.20
UNITRAN		19.13	17.43	23.34	24.31	24.72
VENTEL		8.62	3.83	-10.06	7.35	15.66
WESCO		6.57	6.41	10.82	10.87	6.43
Av. for group without ERP's		14.89	16.01	12.14	18.29	15.80

GROUP WITH ERP's	AV ERP	ROE 1998	ROE 1997	ROE 1996	ROE 1995	ROE 1994
AVIS	14	29.18	36.59	34.57		
BELL	20	0.00	8.16	15.96	16.06	
DORBYL	14	15.52	15.51	16.52		-2.61
DUNLOP	10	5.63	2.59	17.76	14.96	16.89
FELTEX	22	2.69	16.81	14.94	15.52	
GRINCOR	33	8.30	13.44	26.25	16.57	19.57
PLATE-GL	24	17.41	34.87	35.92	29.62	32.85
ROADCOR	27	29.38	13.26	22.81	18.51	17.84
SAFREN	21	9.56	14.38	17.73	18.55	18.12
SUPRGRP	14	18.37	30.54	26.25	22.16	14.66
Av. for group with ERP's		13.60	18.62	22.87	18.99	16.76

JSE SECTOR 86 (continued)

GROUP WITHOUT ERP's	AV ERP	EVA 1998	EVA 1997	EVA 1996	EVA 1995	EVA 1994
BOLTONS		4.06	0.69	-0.97	9.34	5.37
CARGO		9.92	7.08	2.65	6.95	5.25
COMAIR						
IMPERIAL		51.65	-52.06	-60.16	50.43	54.88
LASER		-1.33	-3.87	-19.44	-18.16	-4.38
MAXTYRE						
METAIR		5.82	7.98	12.93	20.20	16.87
METKOR		-63.31	-32.19	-20.06	-103.45	-112.43
MICIND		-4.40	-1.96	3.53	3.54	-0.99
MOBILE		-87.55	-66.79	-50.53	-43.53	-46.02
PUTCO		28.97	-17.27	-11.83	-5.92	5.07
TIWHEEL		-3.75	1.83	-2.01	3.94	2.28
TOYOTA		-239.92	-187.28	-100.46	-44.02	-86.42
TRENCOR		-191.51	-79.95	-39.75	24.59	-13.41
UNISERV		-24.45	-21.57	-30.32	10.14	5.21
UNITRAN		30.43	43.73	19.35	10.20	1.16
VENTEL		-4.48	-4.63	-8.15	-4.04	-1.74
WESCO		-105.66	-110.46	-49.23	8.31	-36.39
Av. for group without ERP's		-37.22	-32.30	-22.15	-4.47	-12.86

GROUP WITH ERP's	AV ERP	EVA 1998	EVA 1997	EVA 1996	EVA 1995	EVA 1994
AVIS	14	101.17	100.72			
BELL	20	-67.55	-8.18	-1.64		
DORBYL	14	-3.83	-53.81	0.51	-85.18	-102.06
DUNLOP	10	-67.98	-87.03	-47.59	-3.65	-17.72
FELTEX	22	-5.82	-1.40	-12.72		
GRINCOR	33	-63.18	-35.08	-41.44	-13.21	-37.05
PLATE-GL	24	96.37	282.52	121.91	110.33	132.71
ROADCOR	27	-2.02	-1.55	-0.05	0.94	-0.21
SAFREN	21	-409.49	-253.30	-215.38	-6.21	-102.22
SUPRGRP	14	-70.26	-5.32	-0.44	-8.54	-1.69
Av. for group with ERP's		-49.26	-6.24	-21.87	-0.79	-18.32

APPENDIX 5.2

AVERAGE ERP PER COMPANY PER SECTOR

(not included in appendix 5.1)

JSE SECTOR 2

COMPANY	AV ERP
DUIKERS	76
WANKIE	60

JSE SECTOR 14

COMPANY	AV ERP
AFR-LEASE	49
ANGGOLD	80
AVGOLD	34
DBN-DEEP	63
DRIES	55
E-DAGGA	36
EERSLNG	41
E-R-P-M	56
GFIELDS	57
HARMONY	48
KALGOLD	54
RANDFONTN	62
SIMMERS	59
ST-HELENA	61
WES-AREAS	57

JSE SECTOR 24

COMPANY	AV ERP
AMPLATS	82
BARPLAT	43
IMPLATS	70
MESSINA	40
NORTHAM	41

JSE SECTOR 39

COMPANY	AV ERP
SCHARIG	19

JSE SECTOR 40

COMPANY	AV ERP
ABSA	21
SBIC	14

JSE SECTOR 43

COMPANY	AV ERP
SA-EAGLE	20

JSE SECTOR 44

COMPANY	AV ERP
JOHNNIC	30

JSE SECTOR 48

COMPANY	AV ERP
APEX	14

JSE SECTOR 63

COMPANY	AV ERP
JASCO	10
TELJOY	17

JSE SECTOR 67

COMPANY	AV ERP
EDUCOR	24

JSE SECTOR 69

COMPANY	AV ERP
PRIME	11

JSE SECTOR 73

COMPANY	AV ERP
SAPPI	66

JSE SECTOR 78

COMPANY	AV ERP
HIVELD	66
ISCOR	74

JSE SECTOR 88

COMPANY	AV ERP
ALUDIE	28

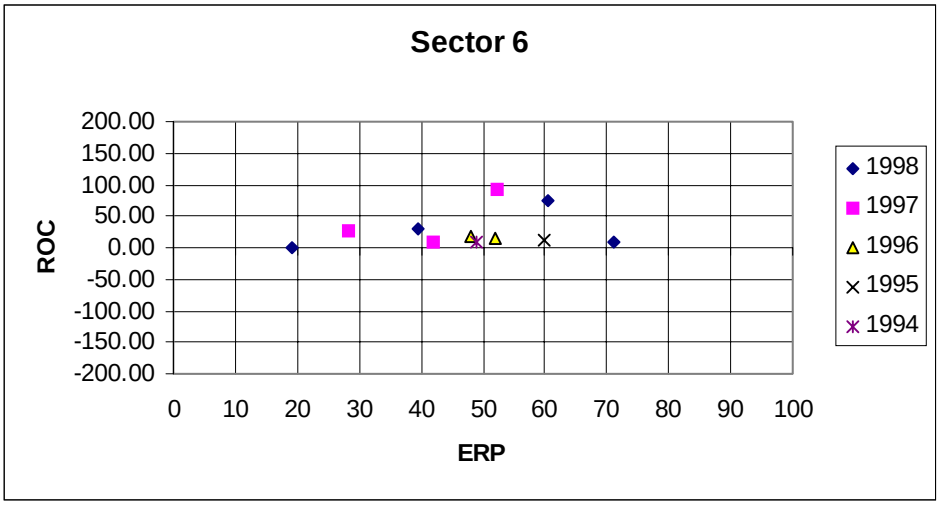
JSE SECTOR 89

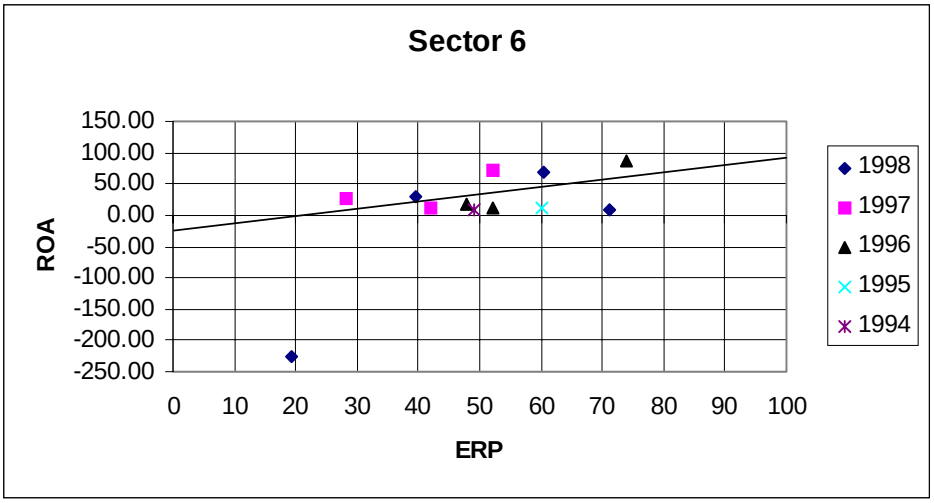
COMPANY	AV ERP
RARECO	26
SAMROC	10

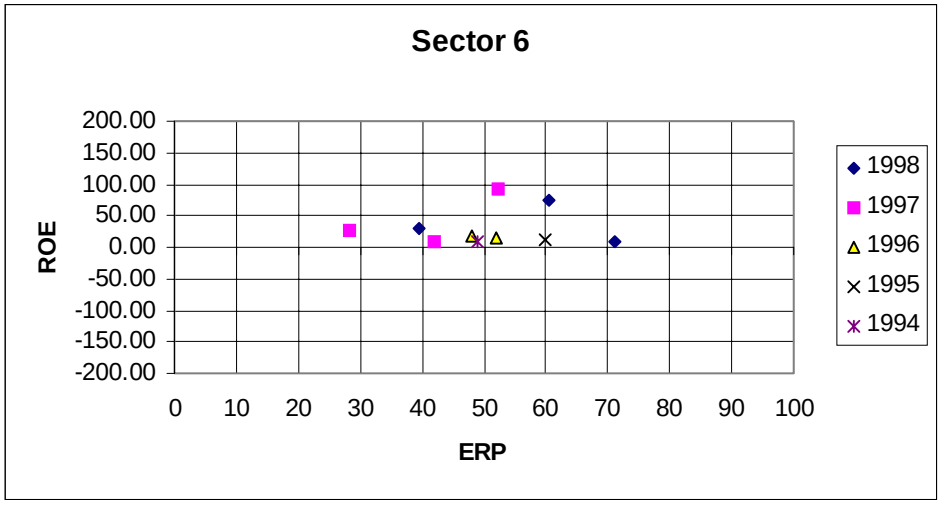
APPENDIX 6

DATA PLOTS

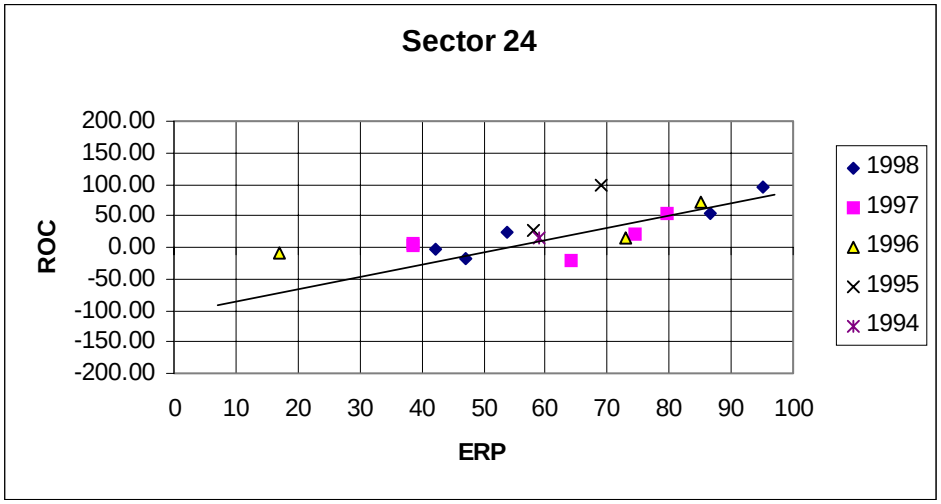
JSE SECTOR 6

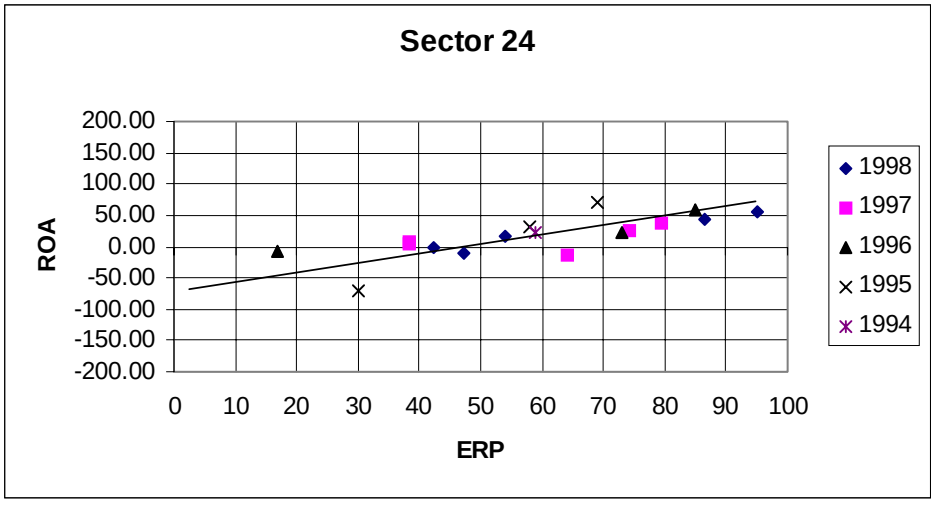


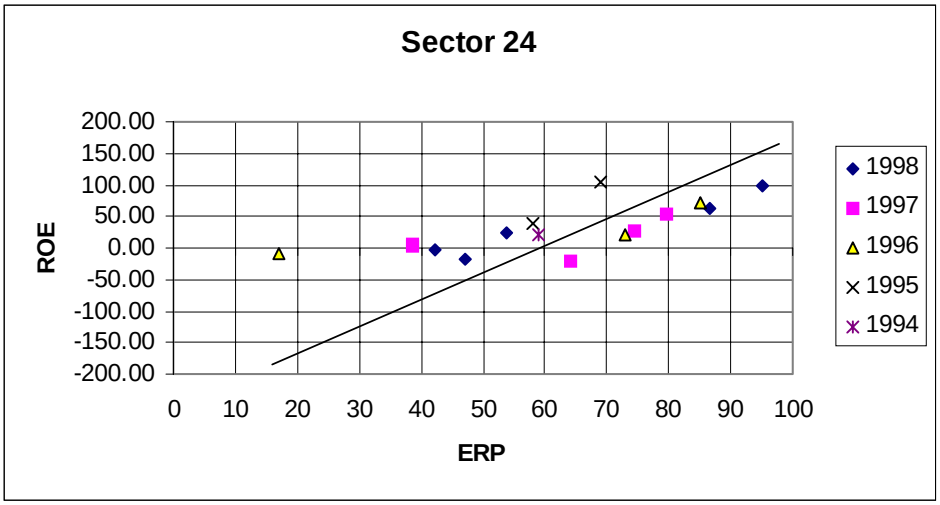




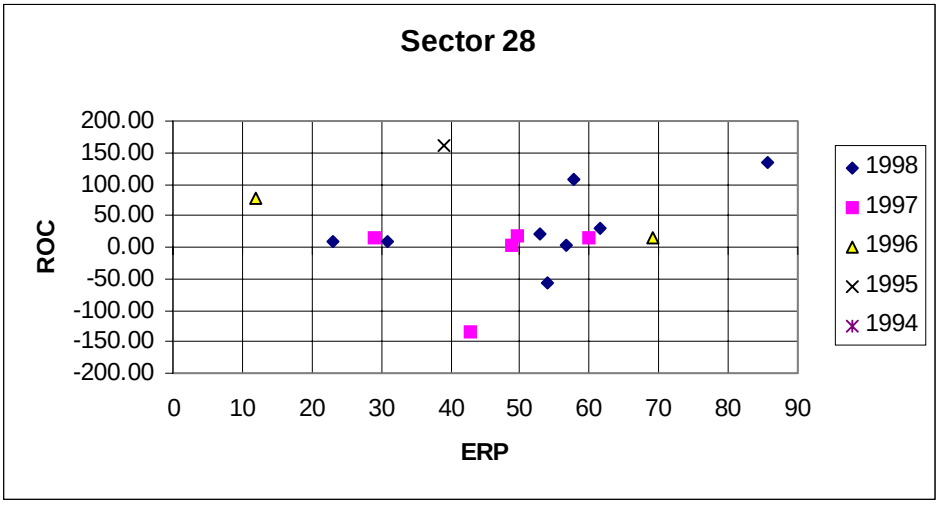
JSE SECTOR 24

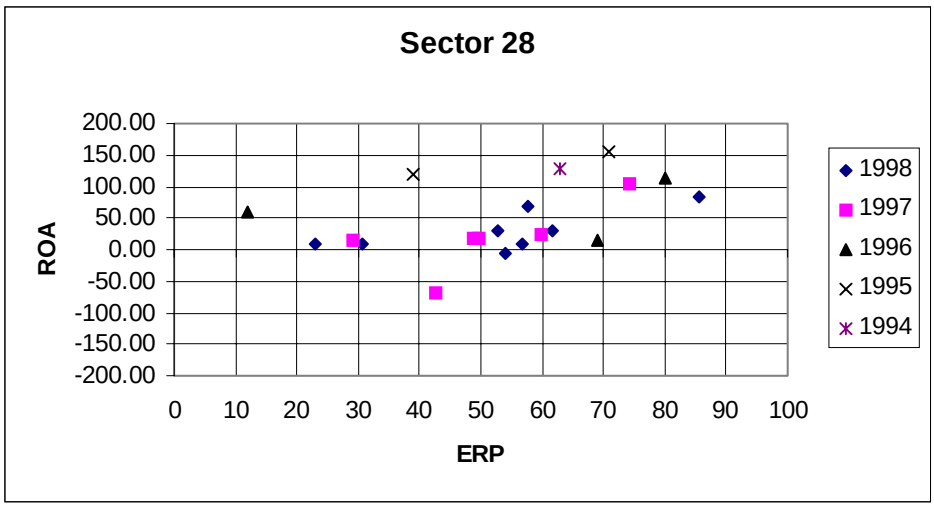


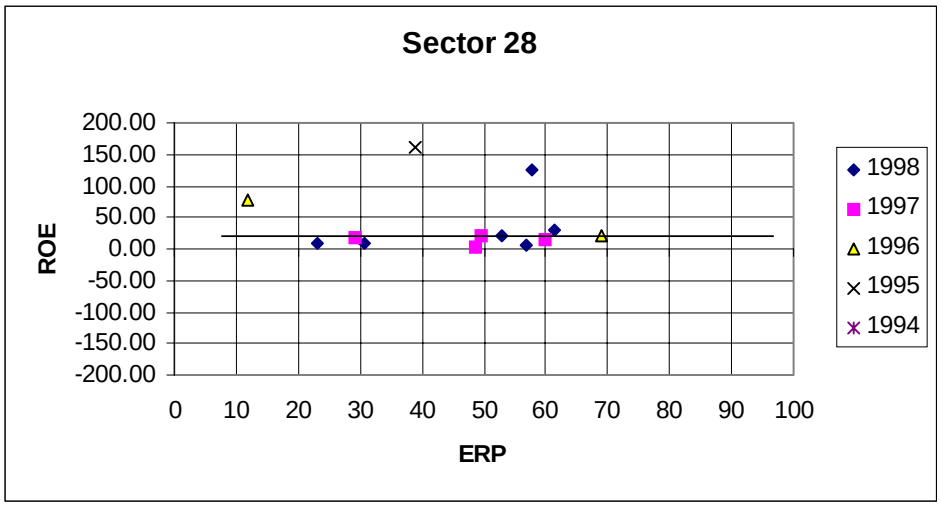




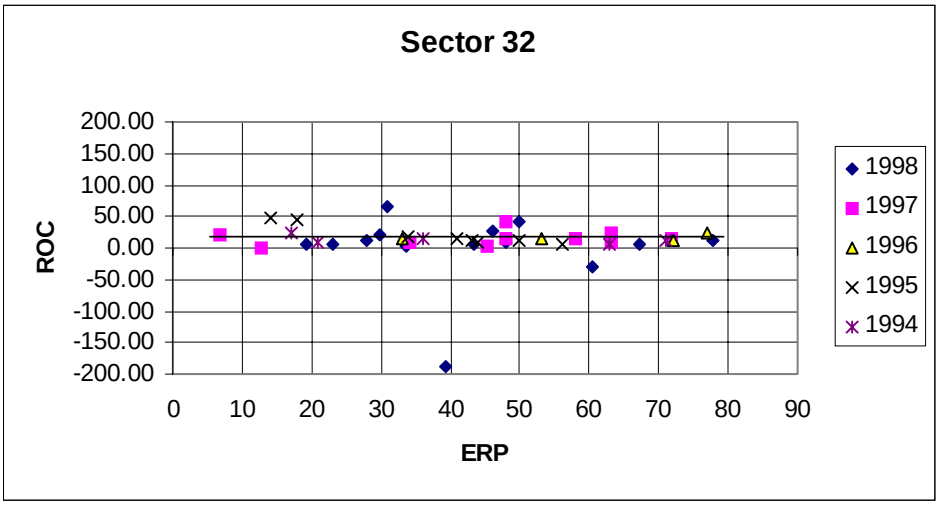
JSE SECTOR 28

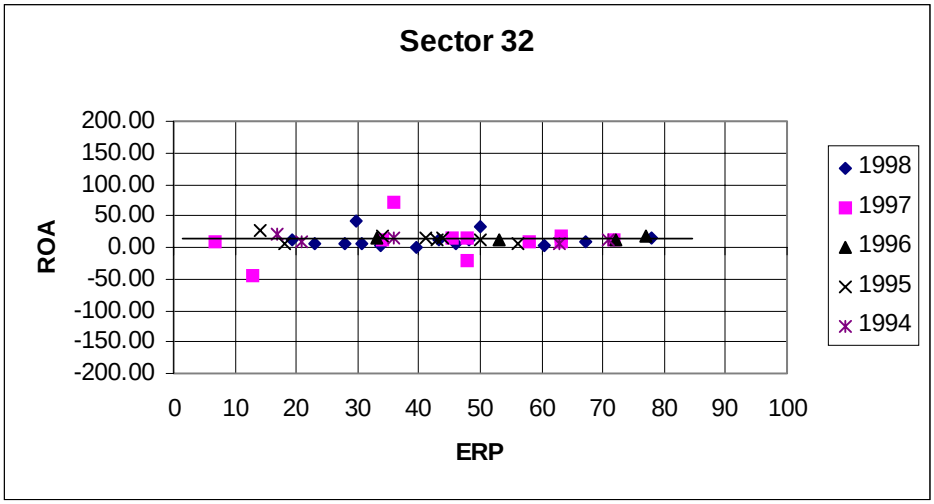


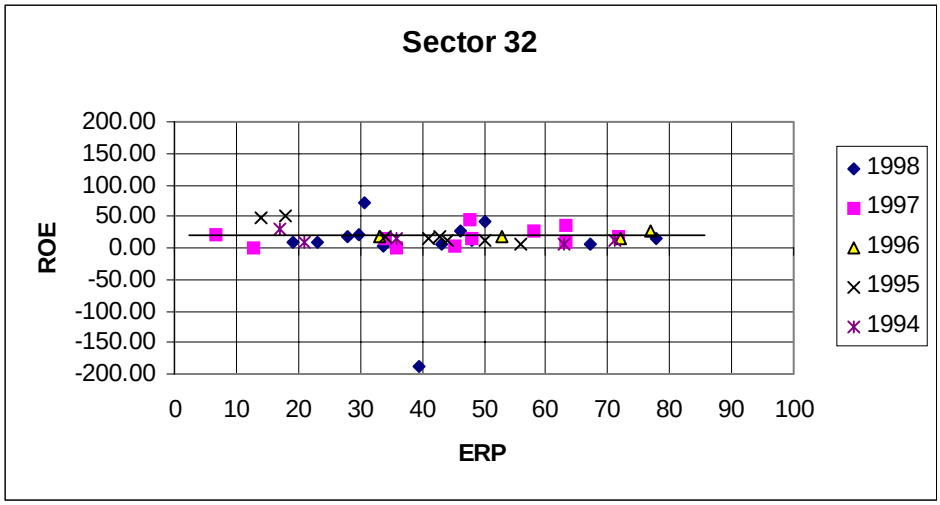




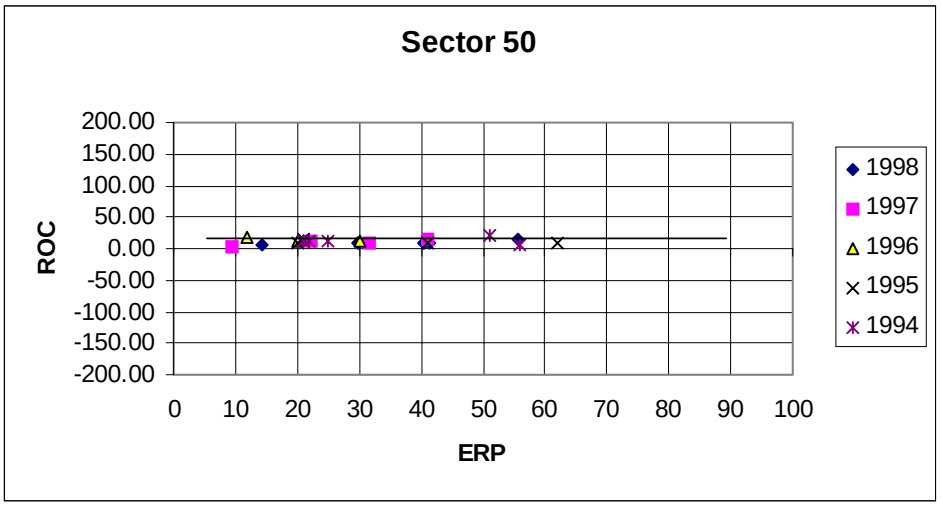
JSE SECTOR 32

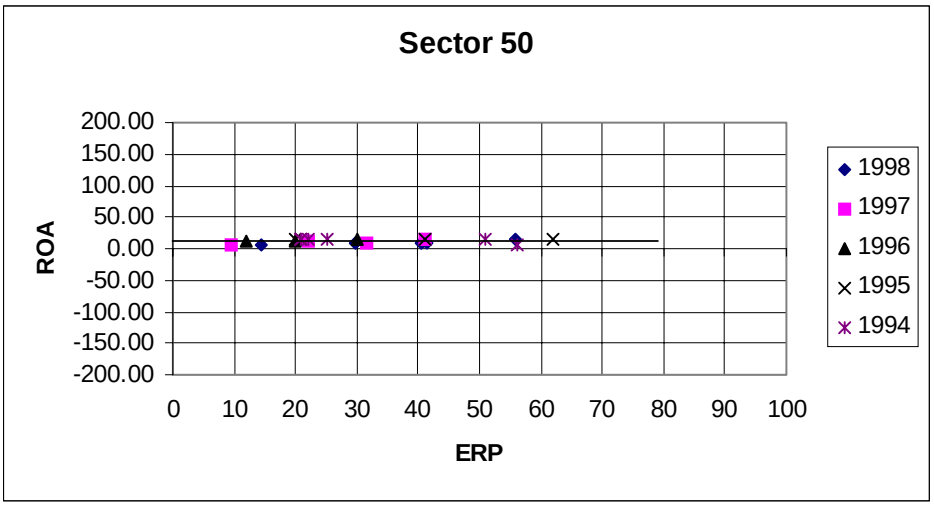


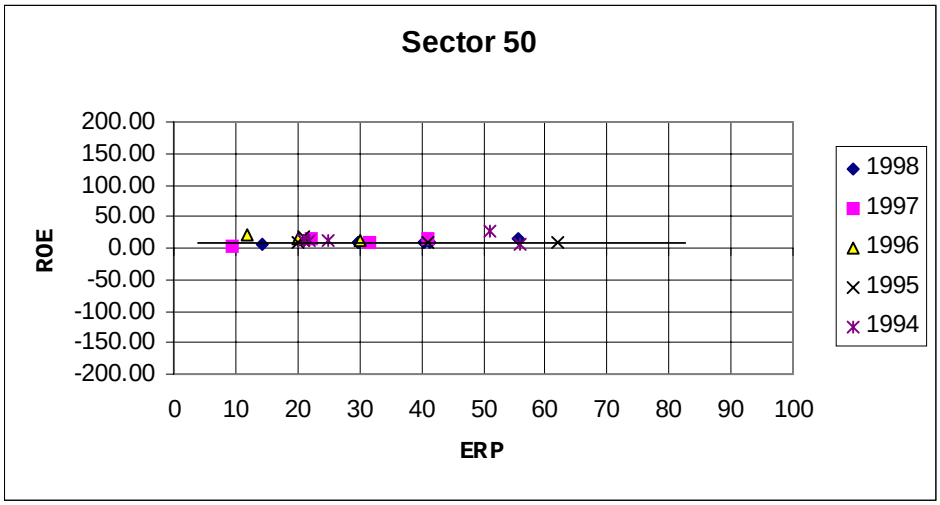


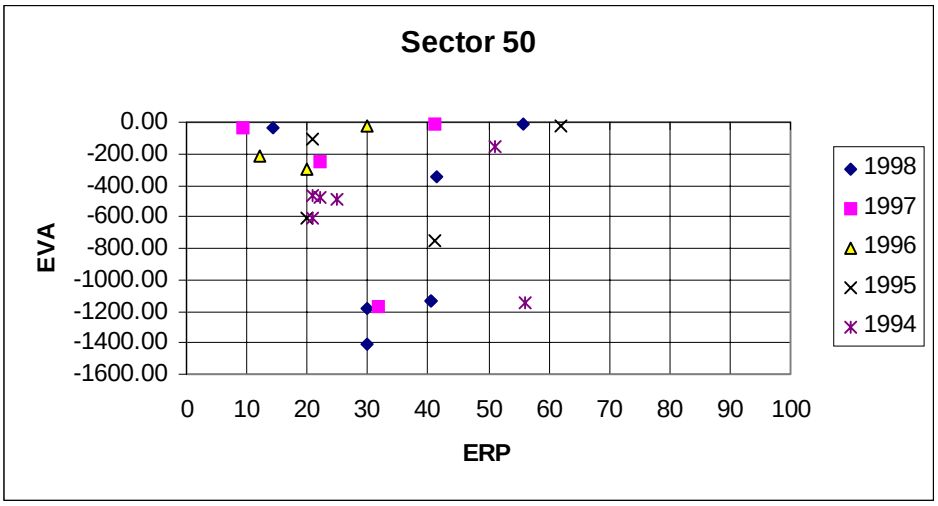


JSE SECTOR 50

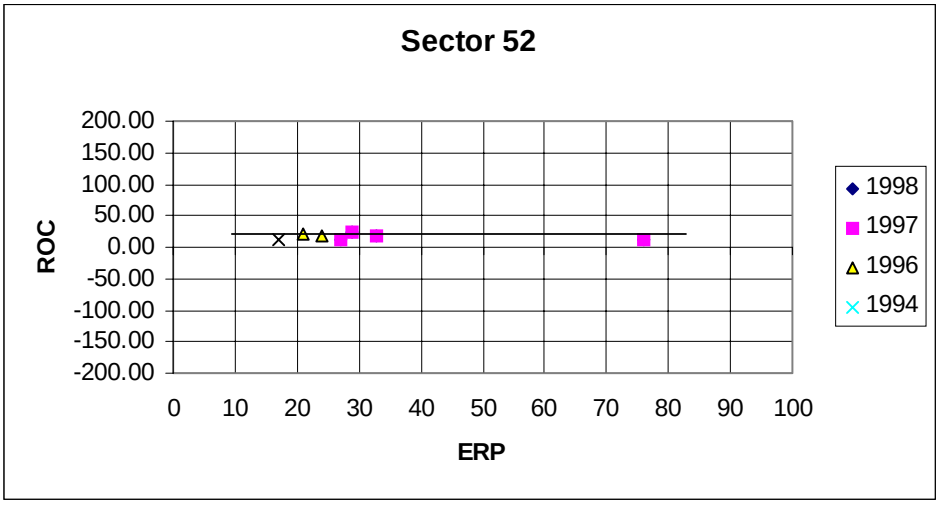


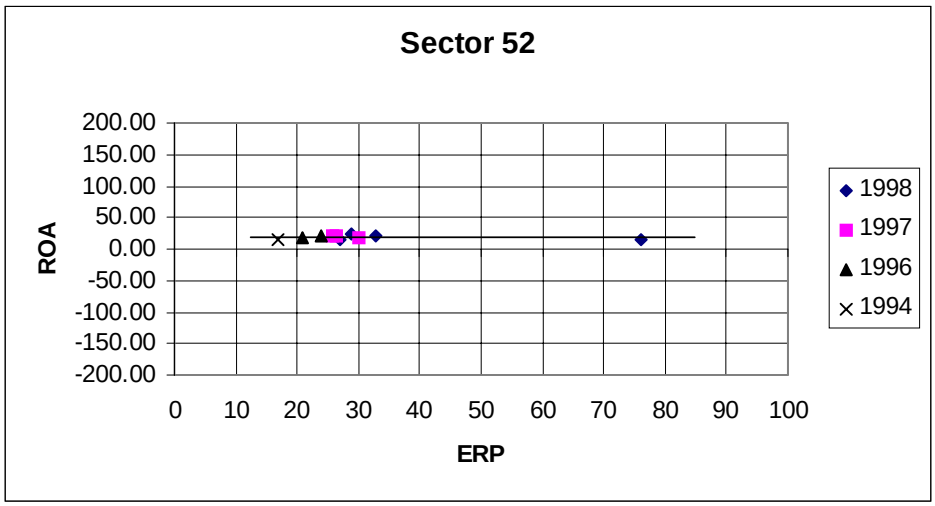






JSE SECTOR 52

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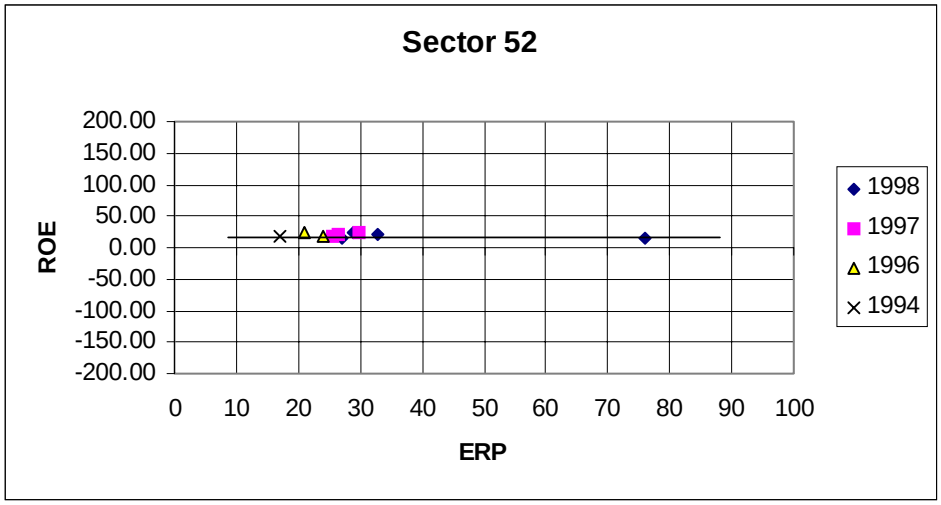
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ROE
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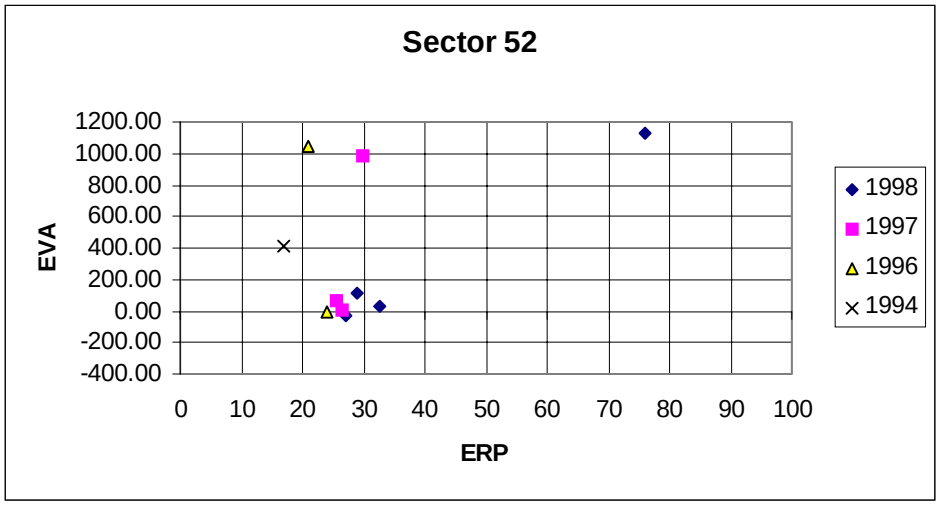
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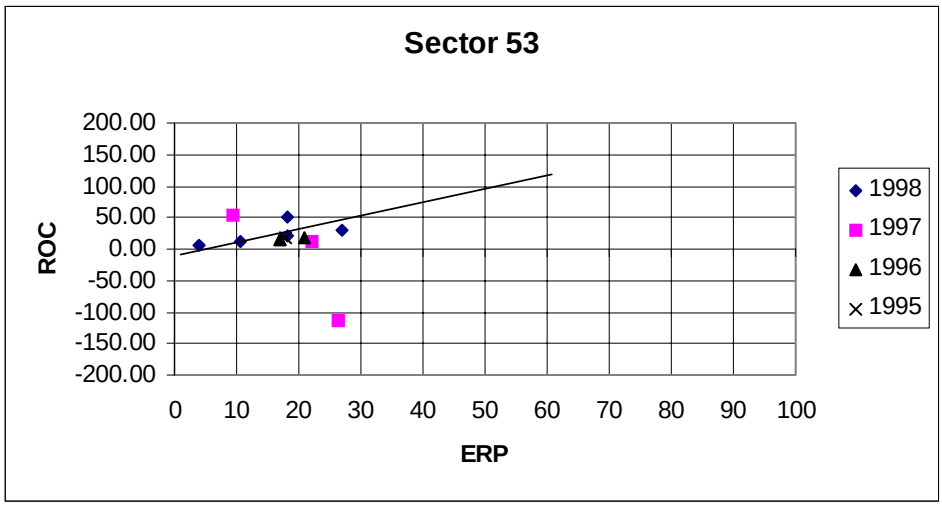
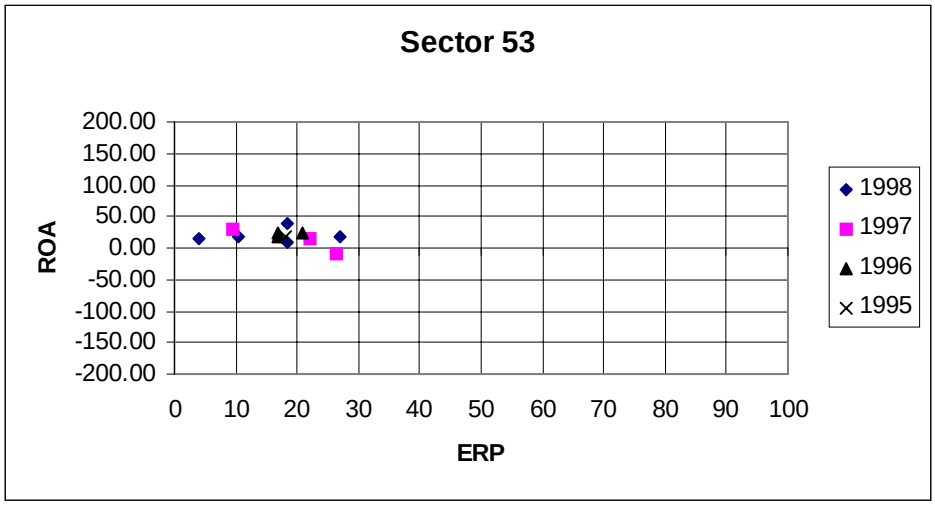
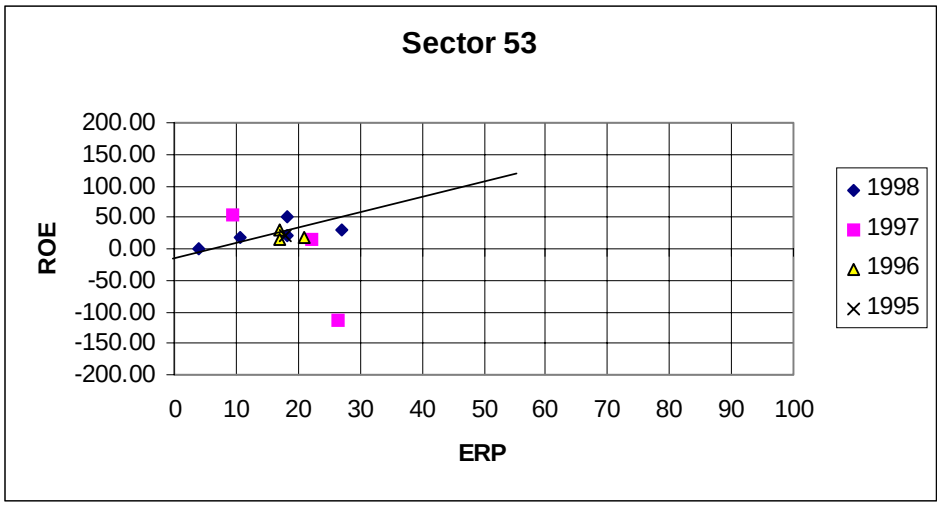
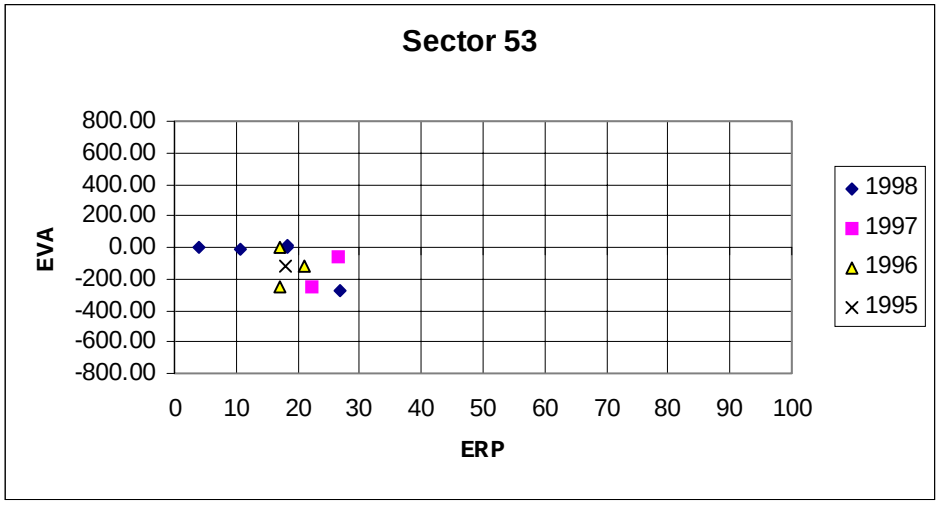
JSE SECTOR 53

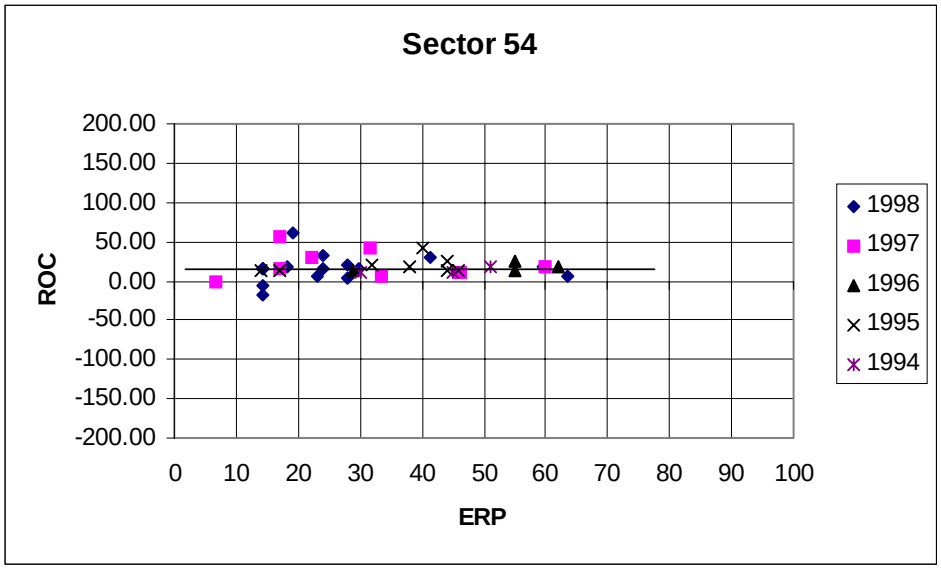


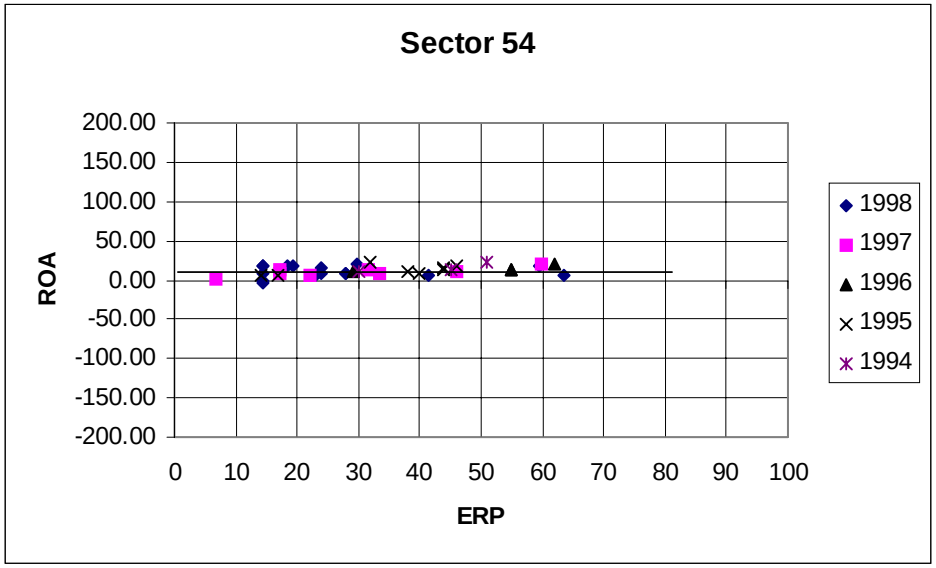


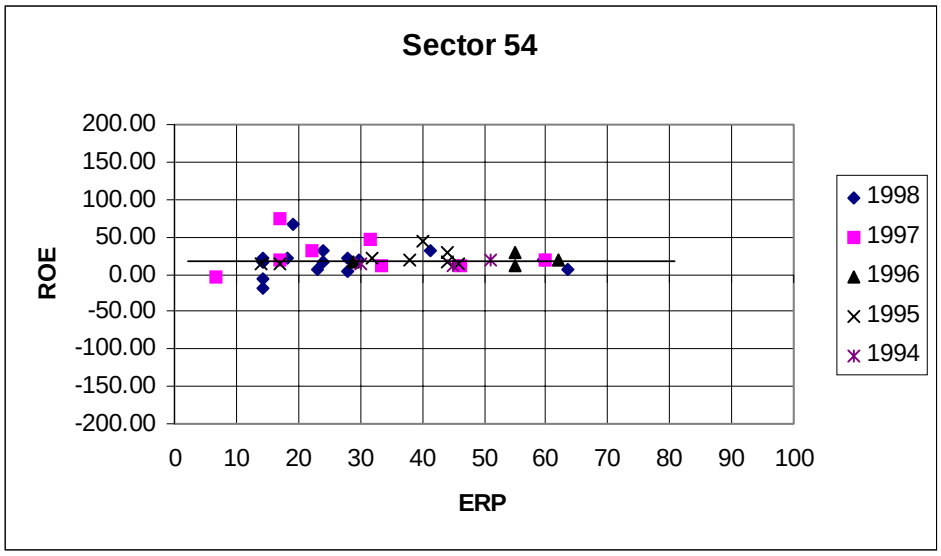


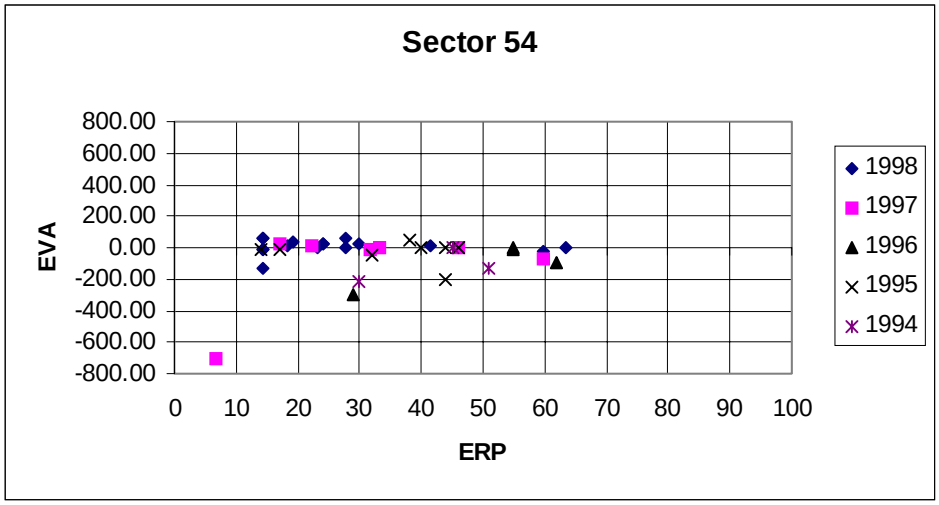


JSE SECTOR 54

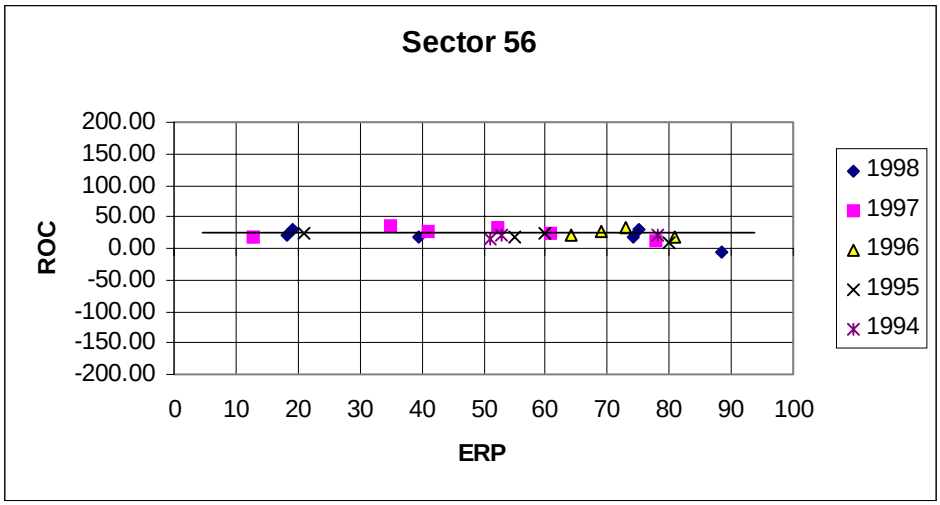


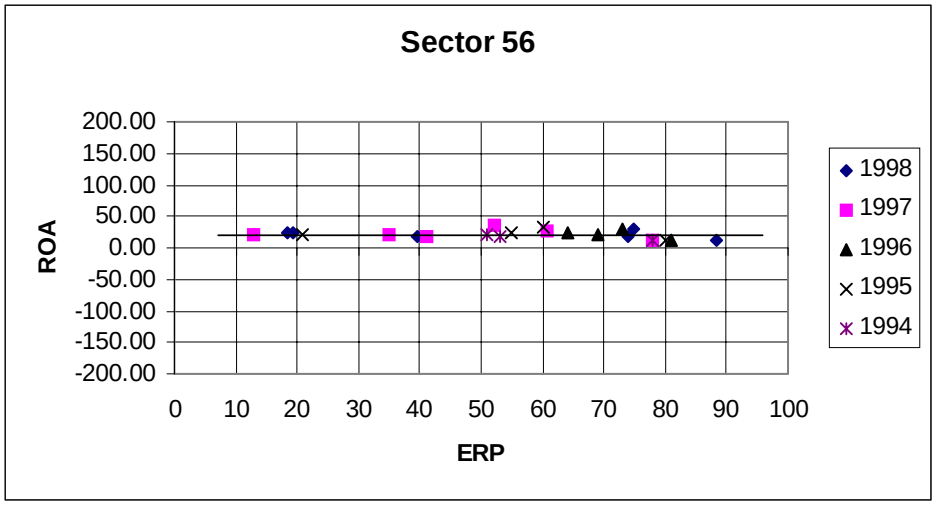






JSE SECTOR 56

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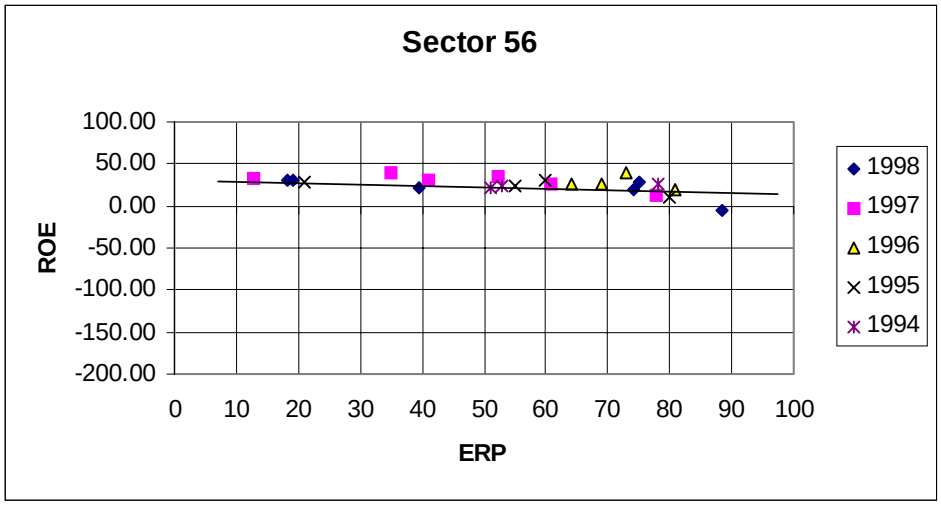
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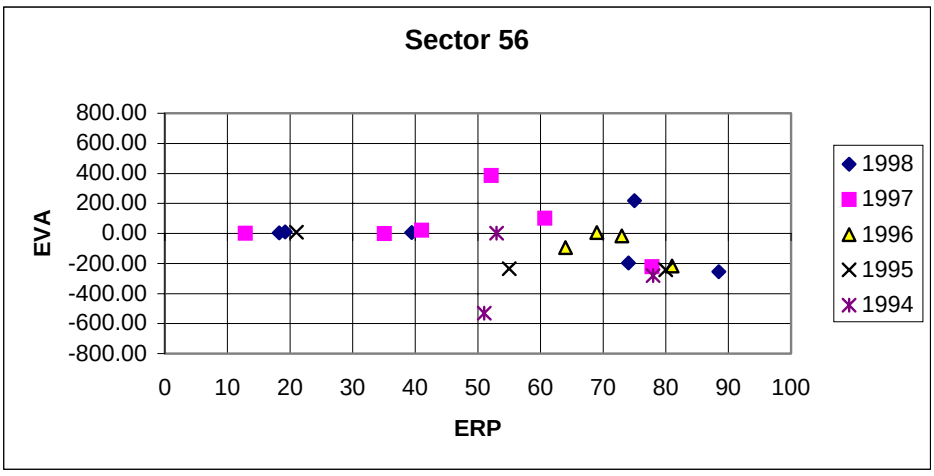
Sector 56
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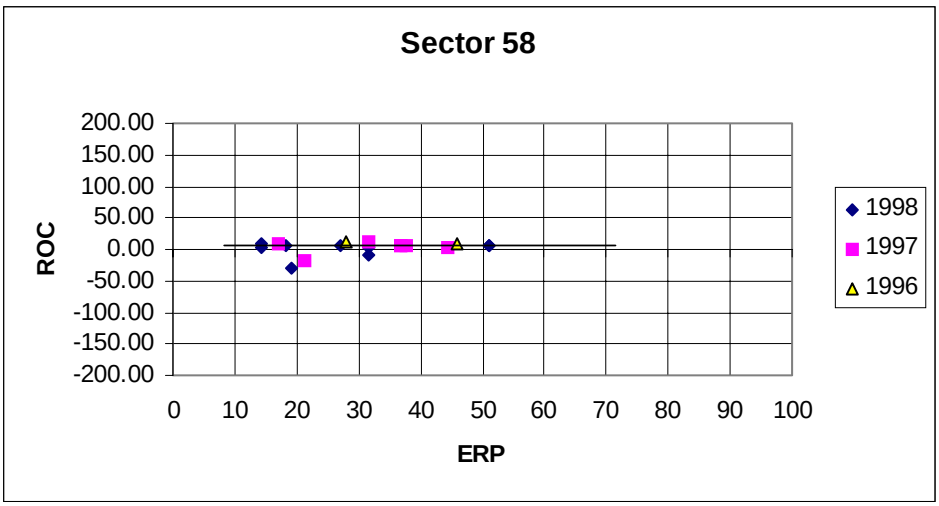
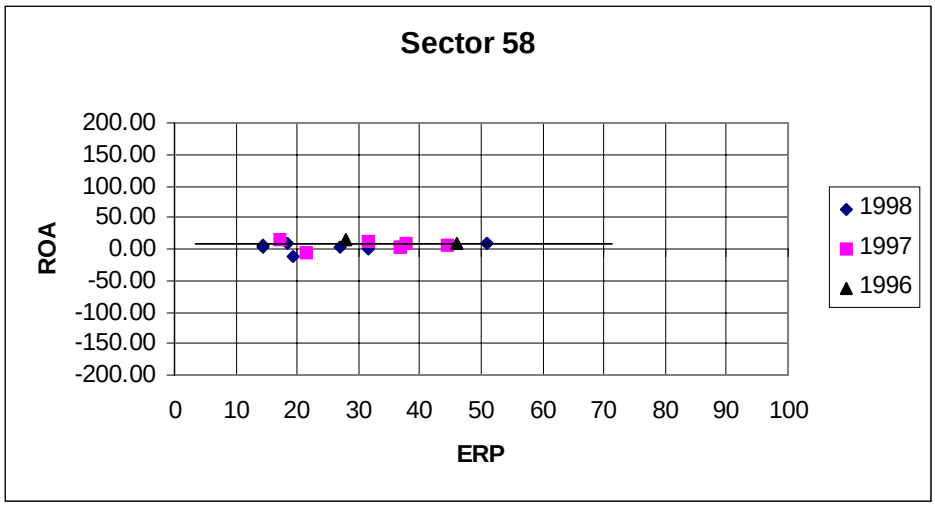
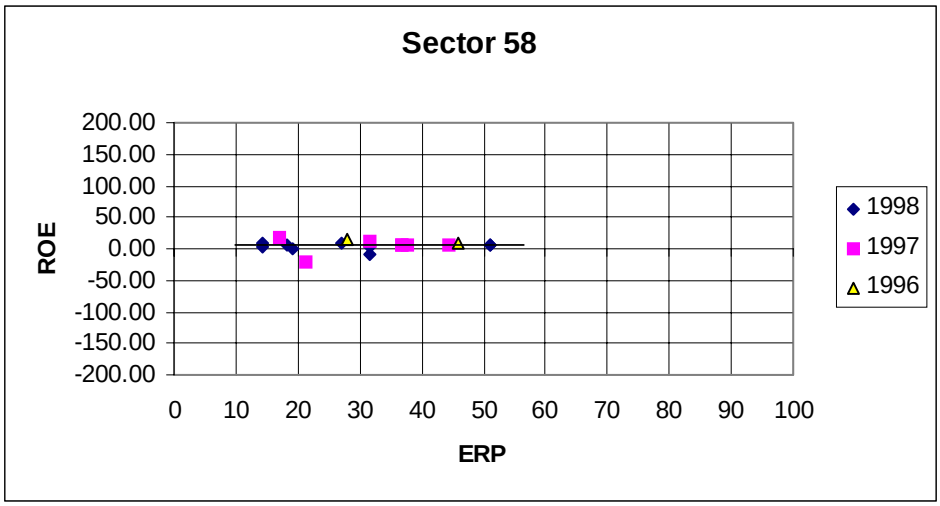
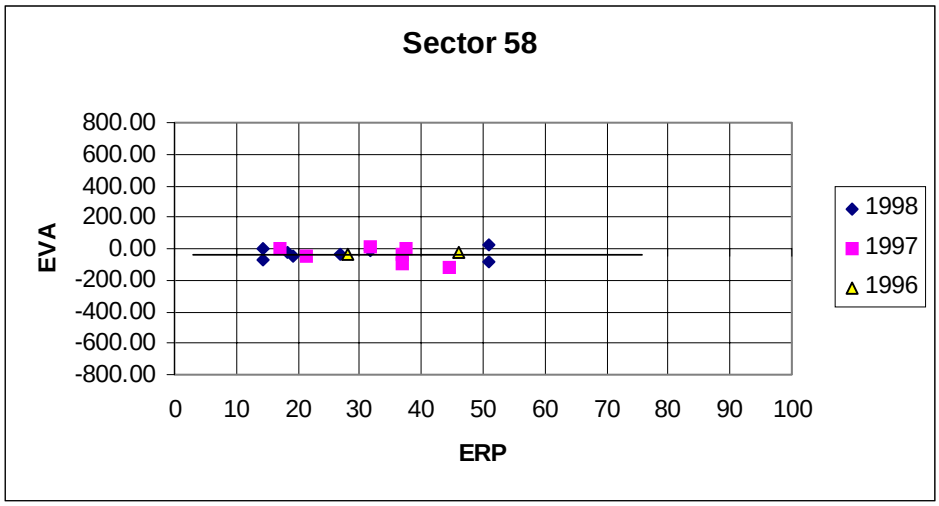
JSE SECTOR 58

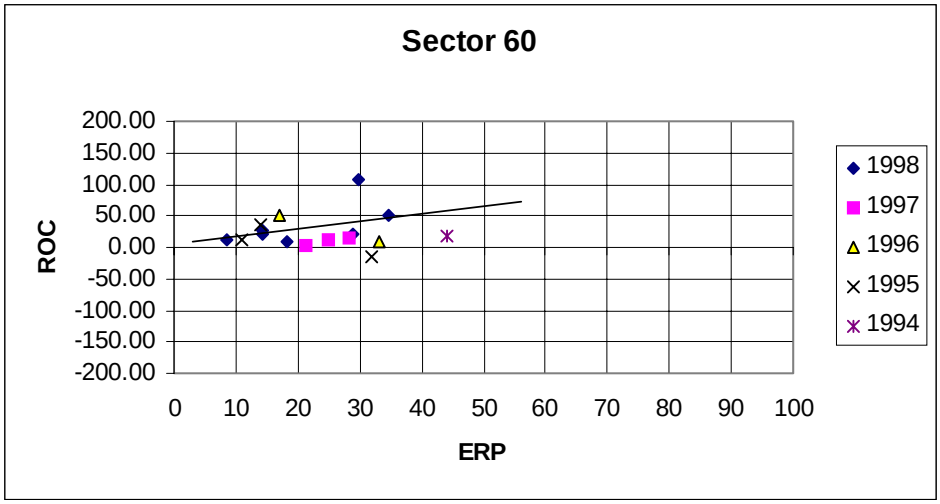


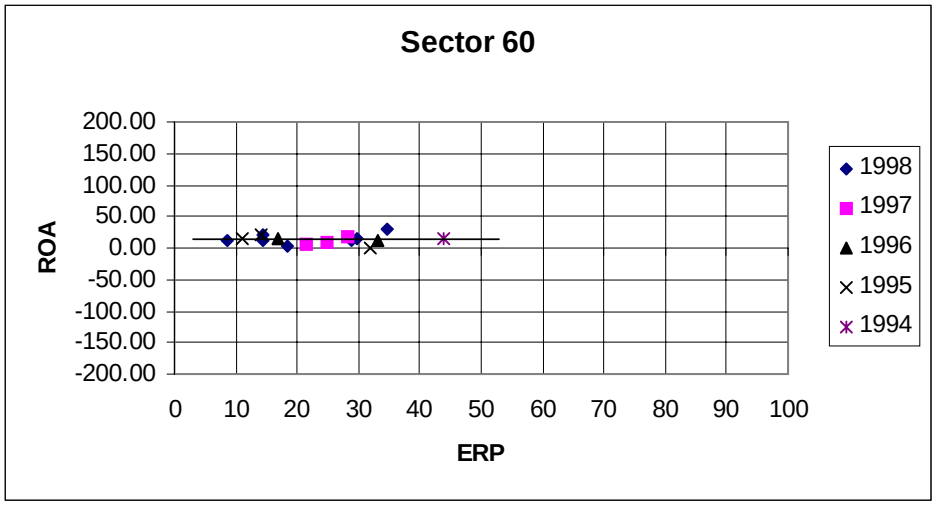


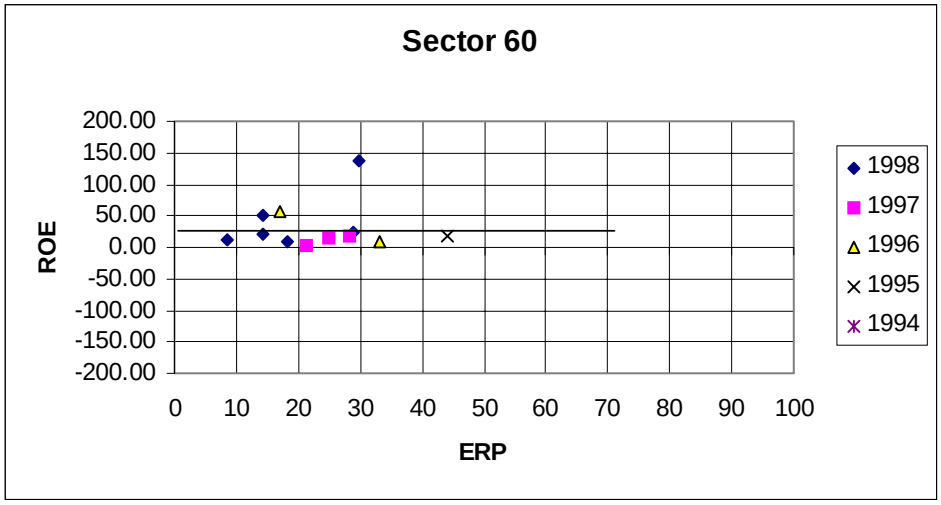


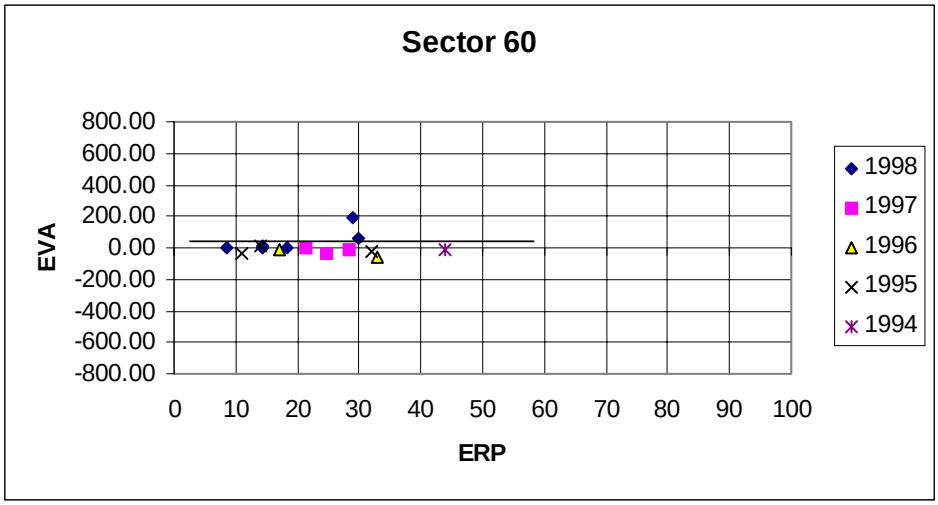


JSE SECTOR 60

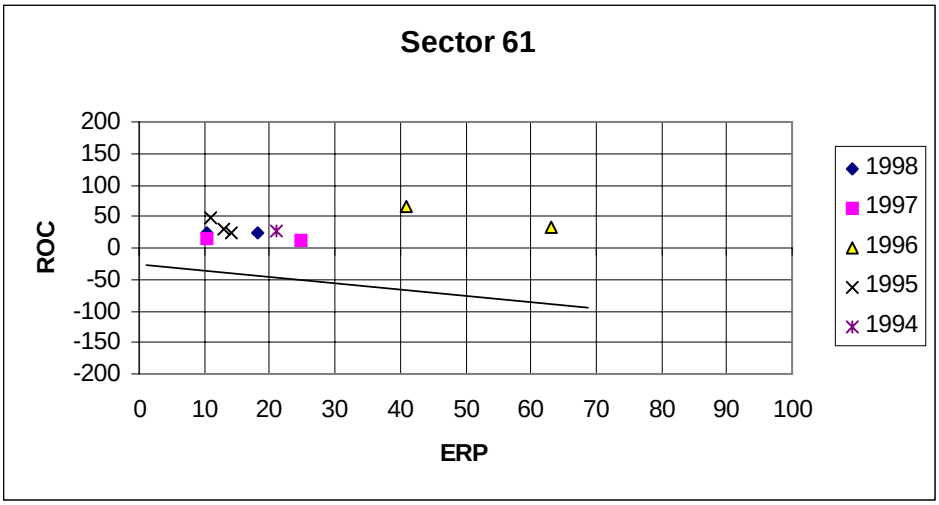


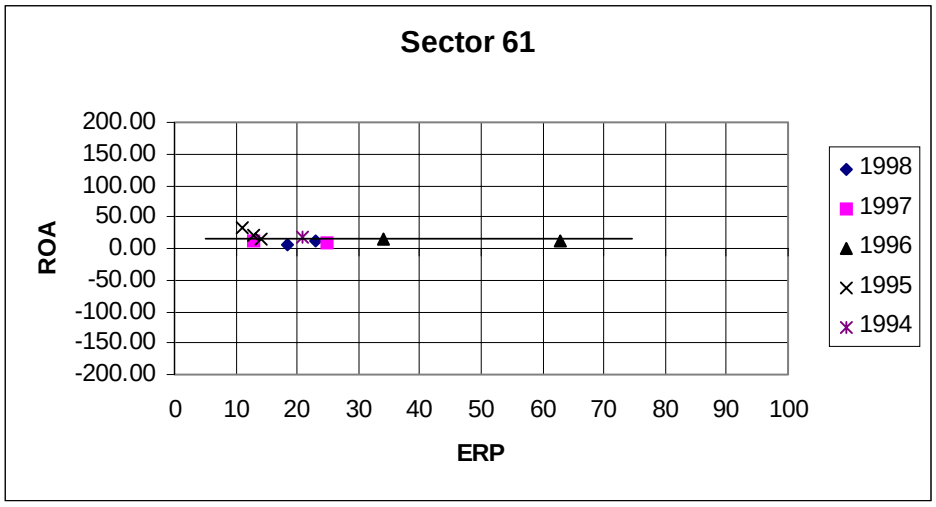


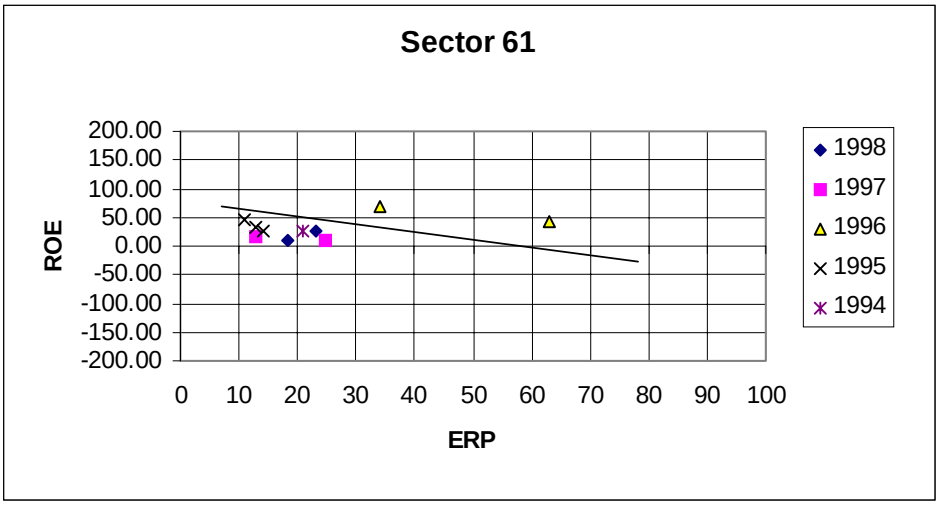




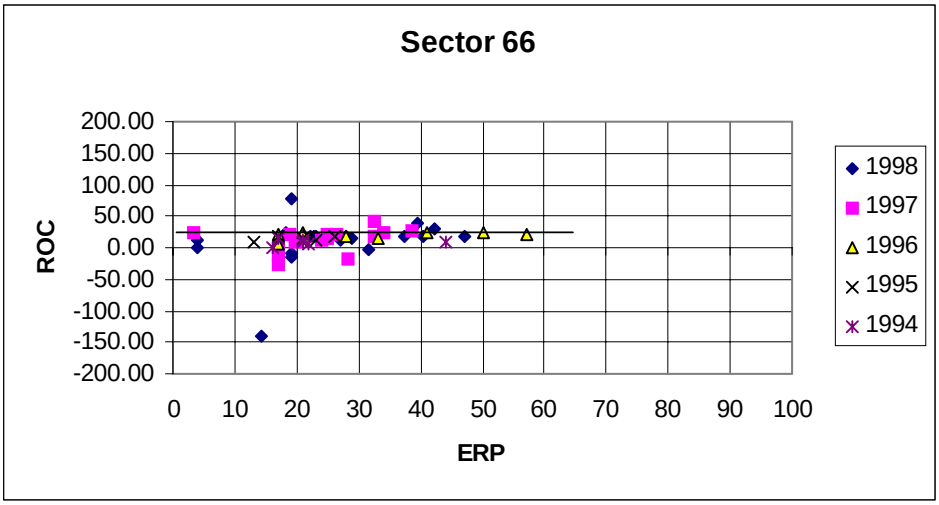
JSE SECTOR 61

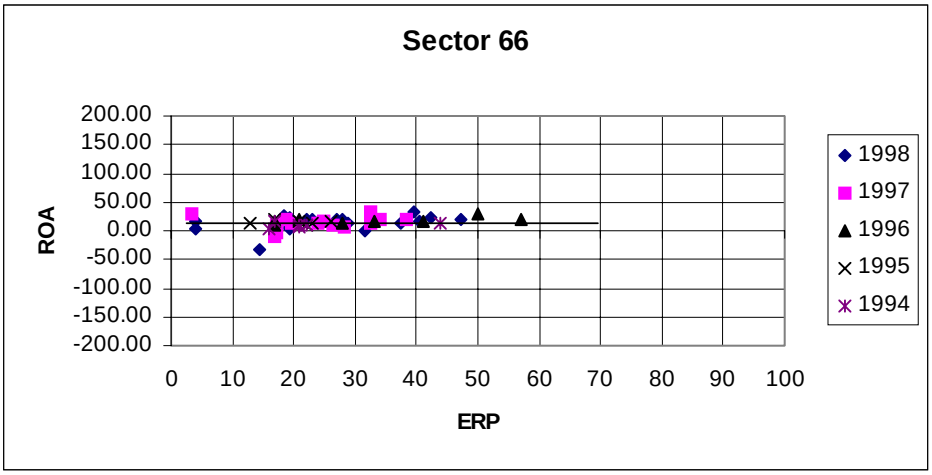






JSE SECTOR 66

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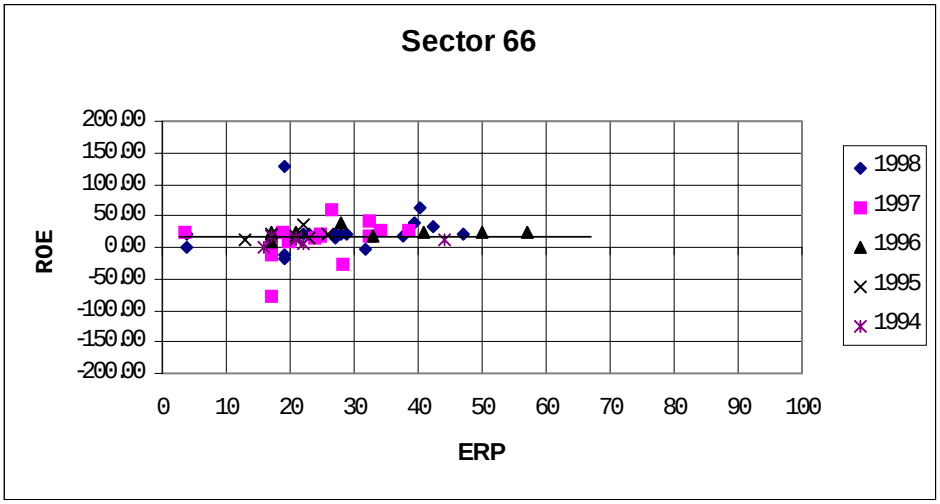
Sector 66
ROE
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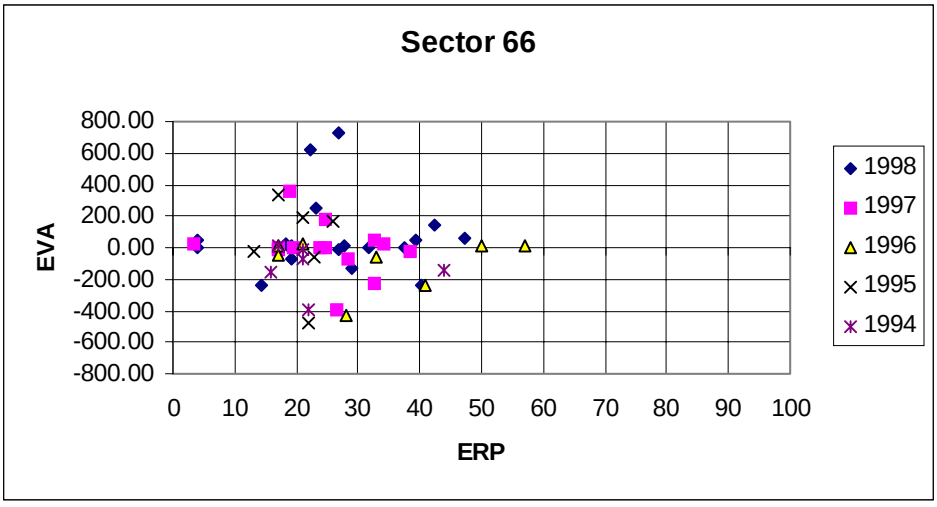
Sector 66
EVA
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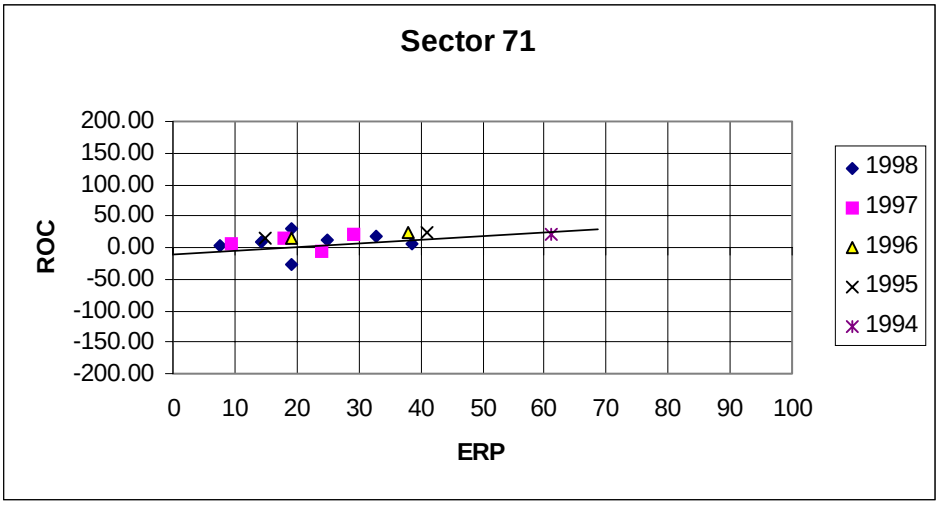
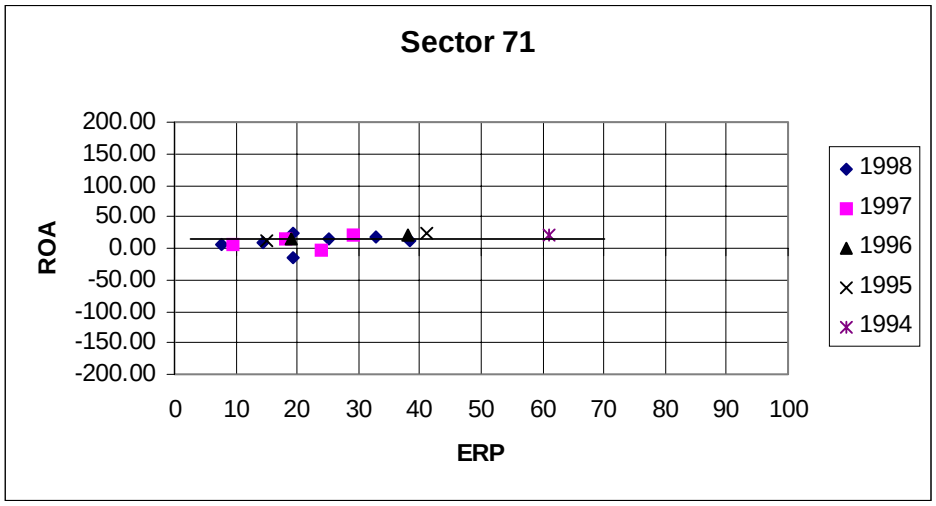
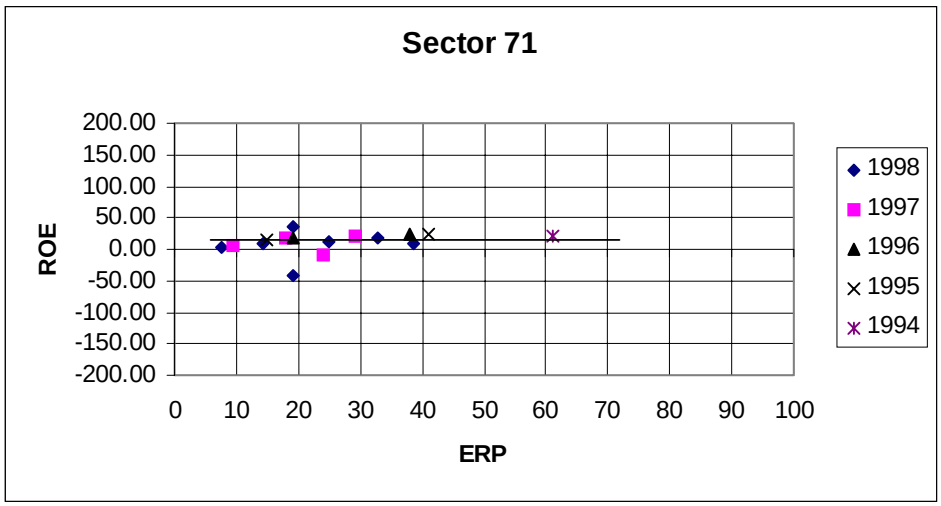
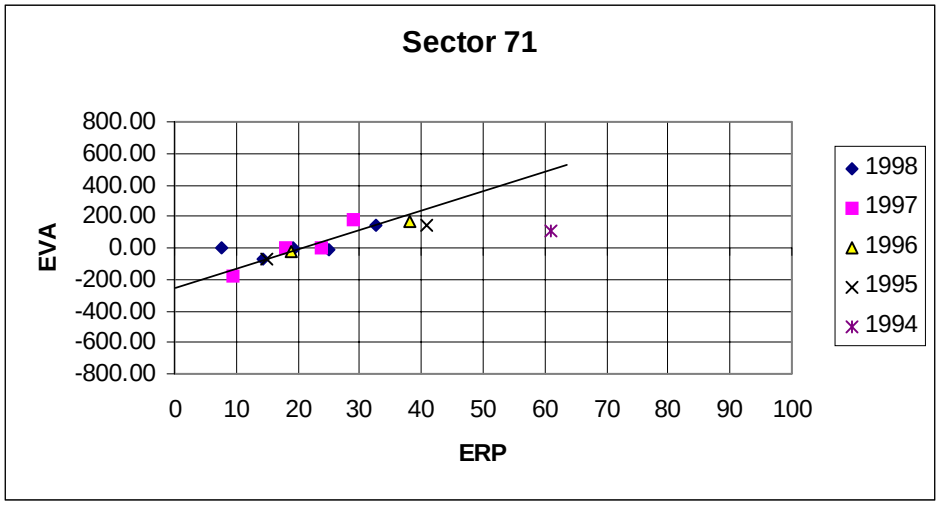
JSE SECTOR 71

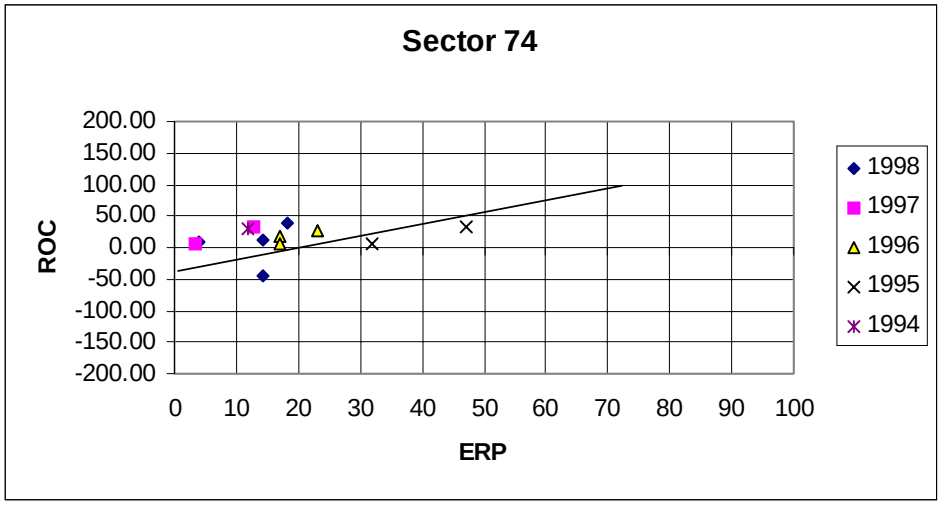


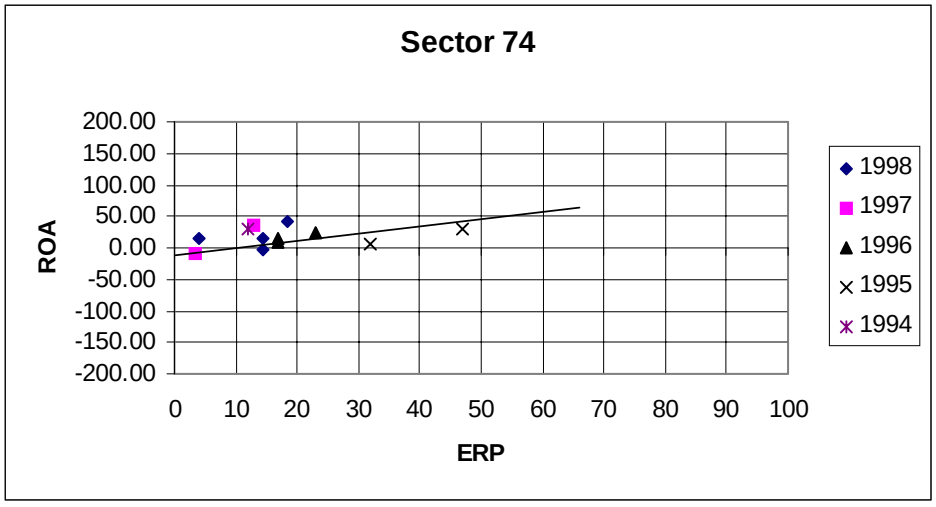


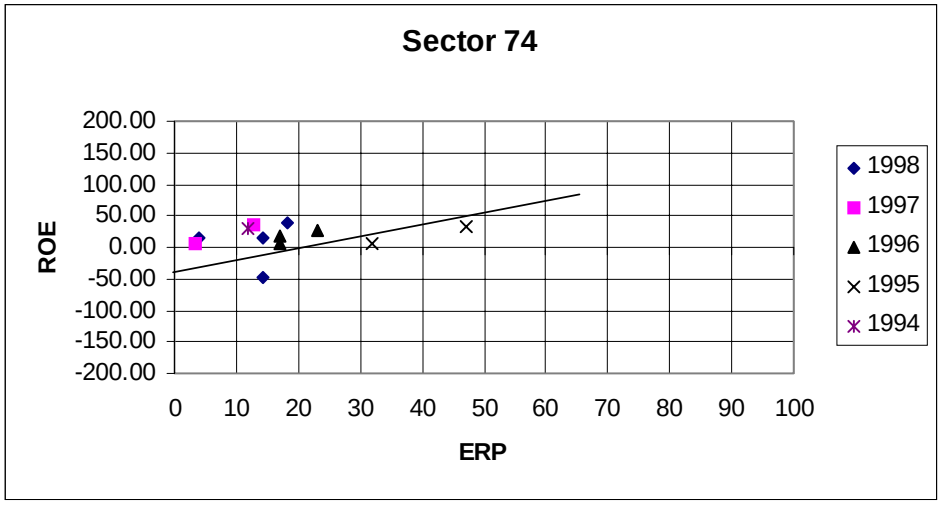


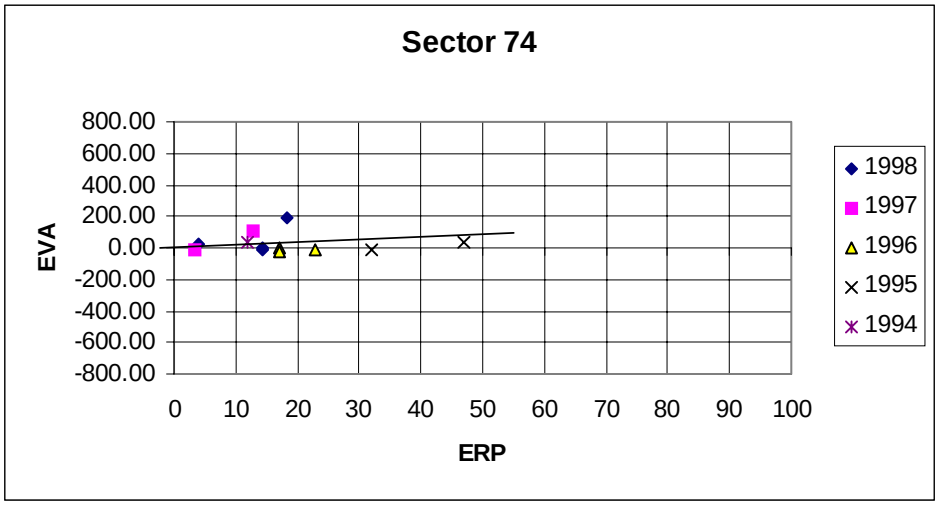


JSE SECTOR 74

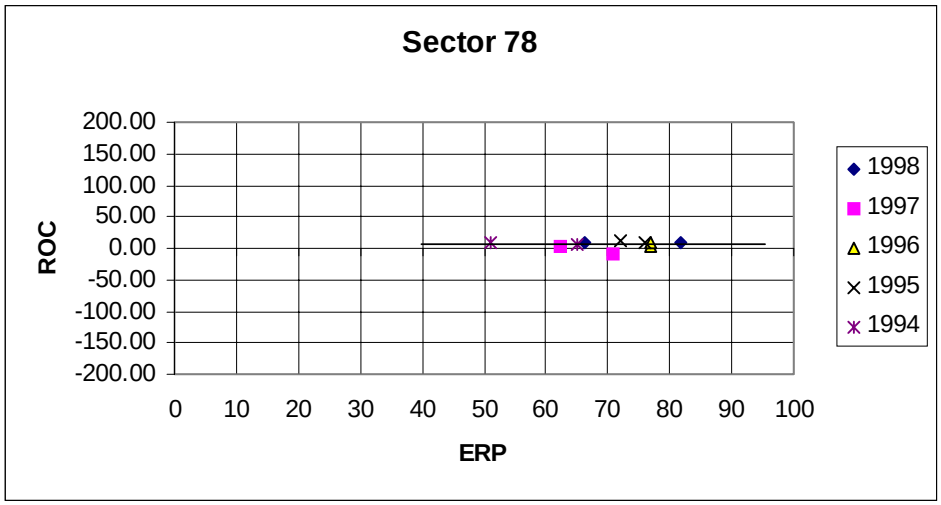


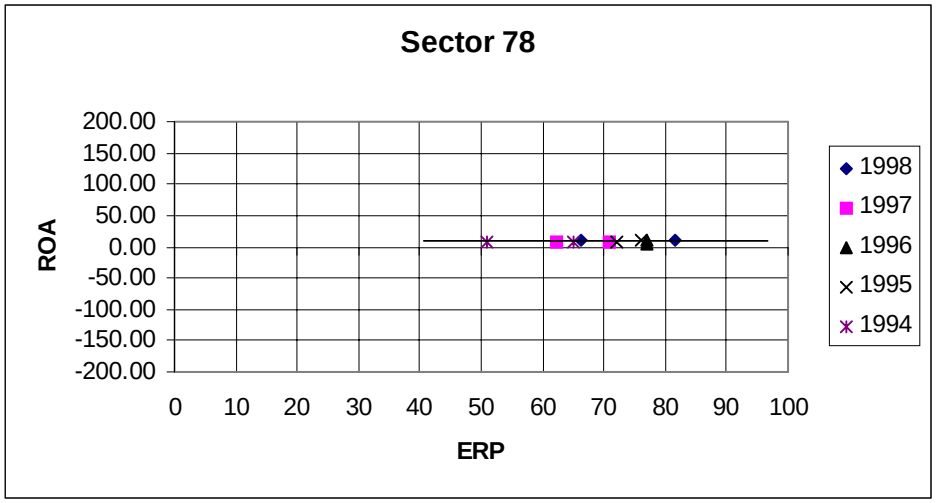






JSE SECTOR 78

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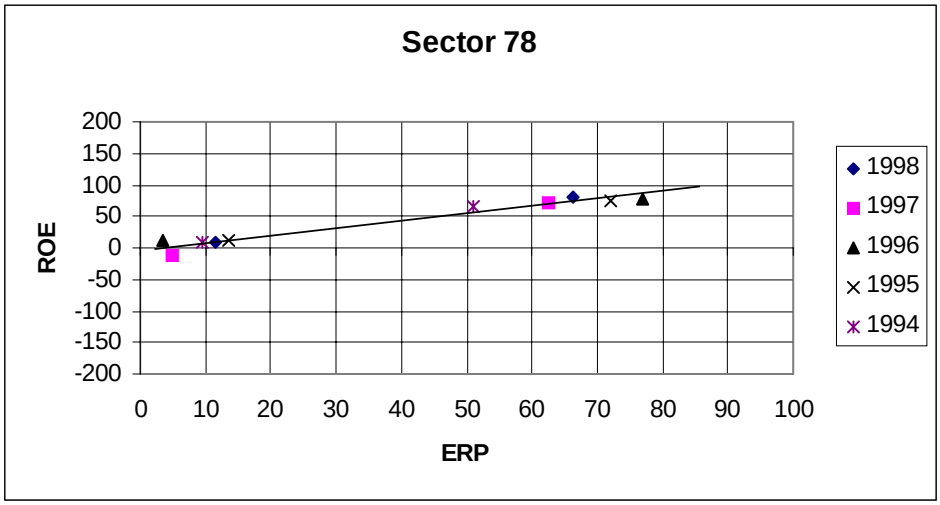
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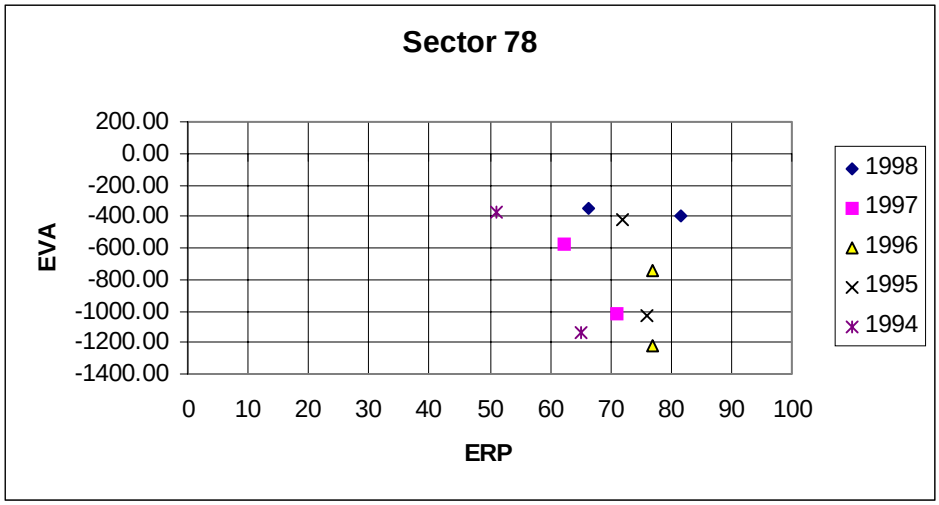
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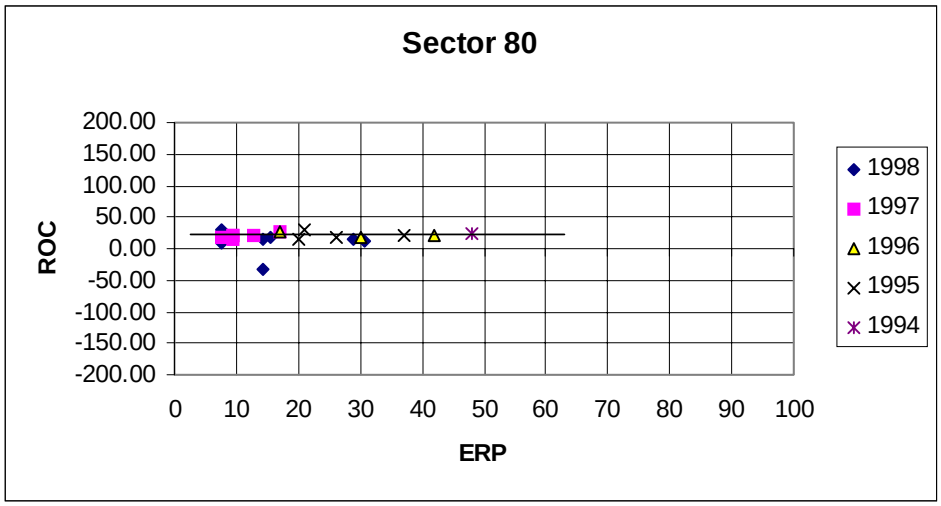
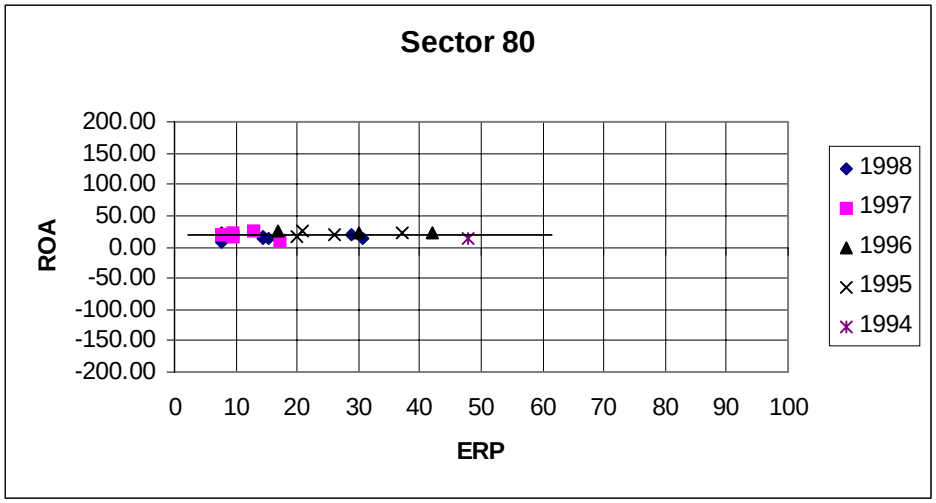
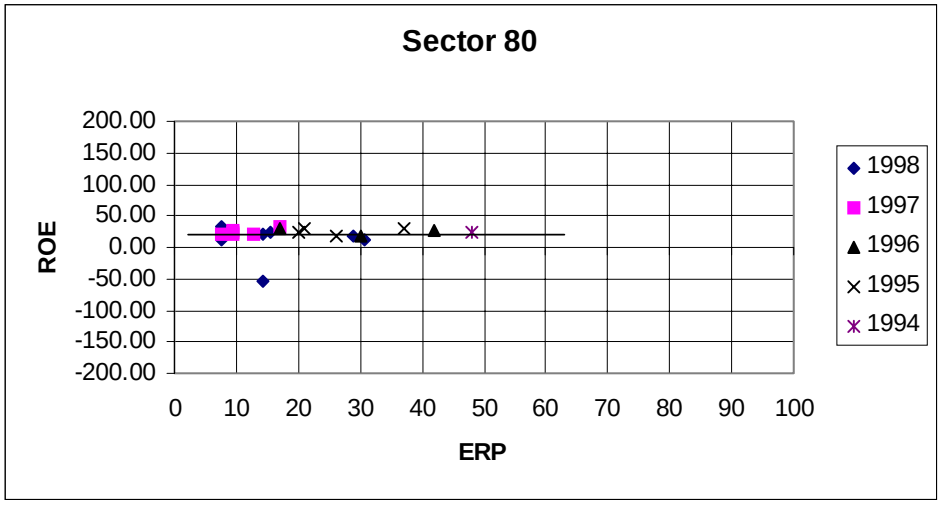
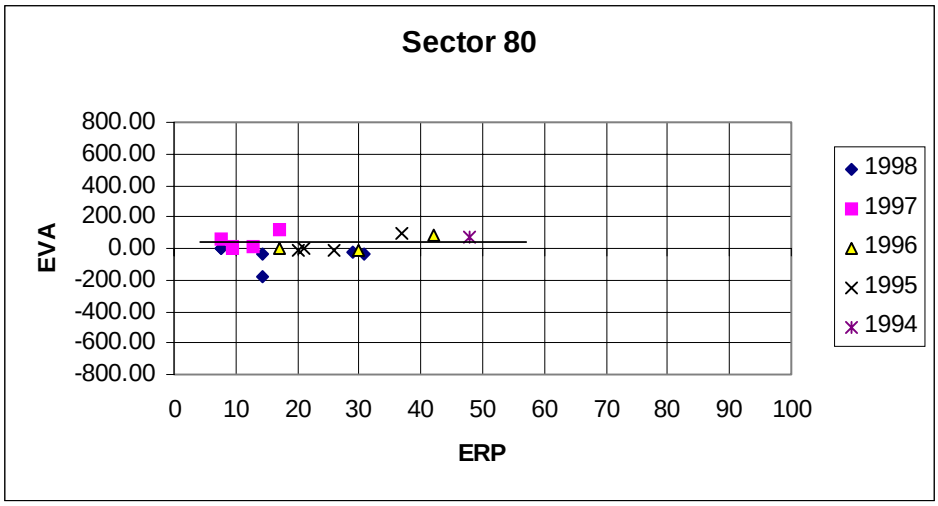
JSE SECTOR 80

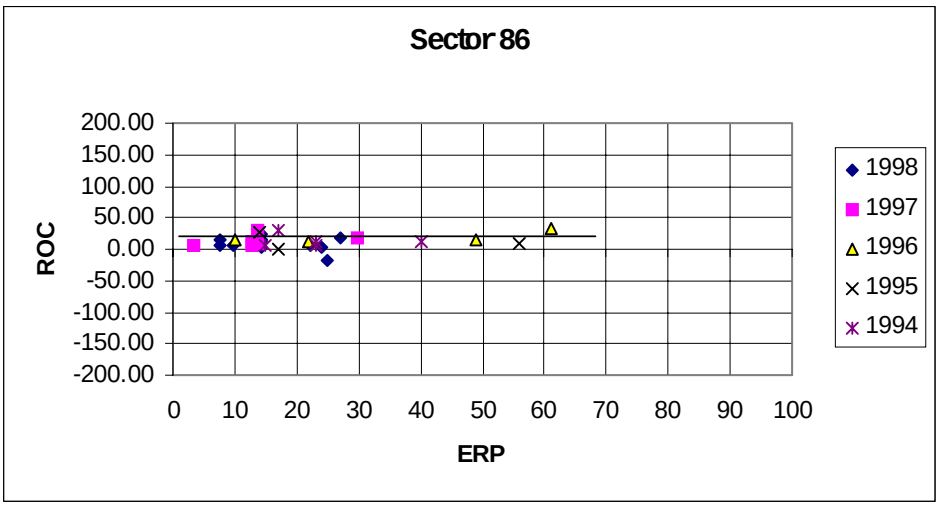


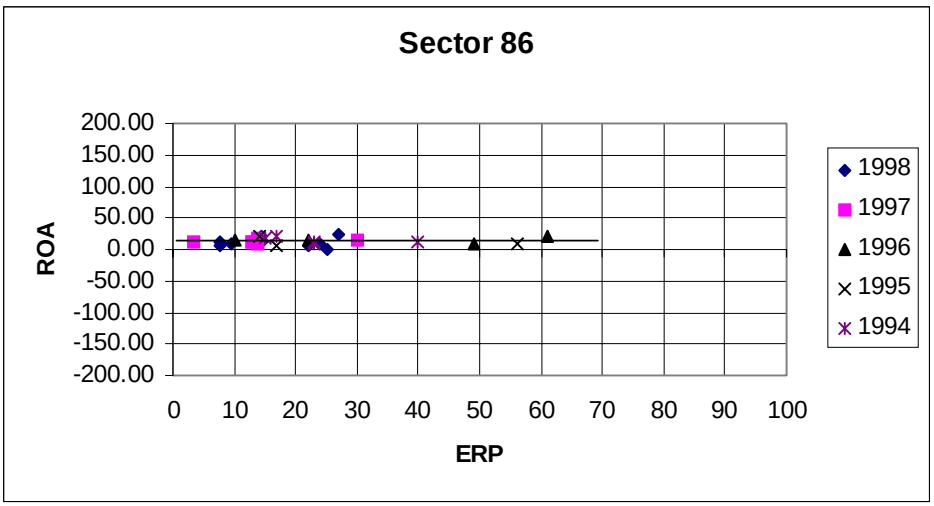


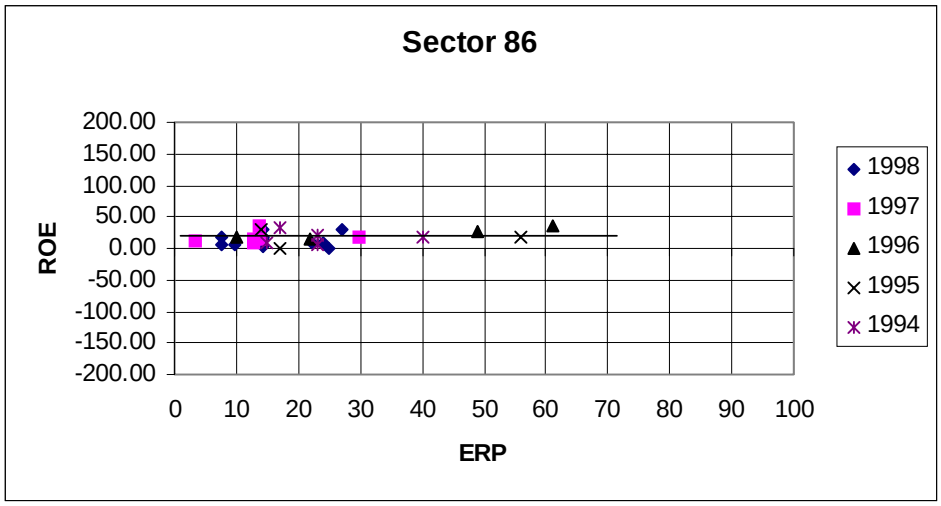




JSE SECTOR 86



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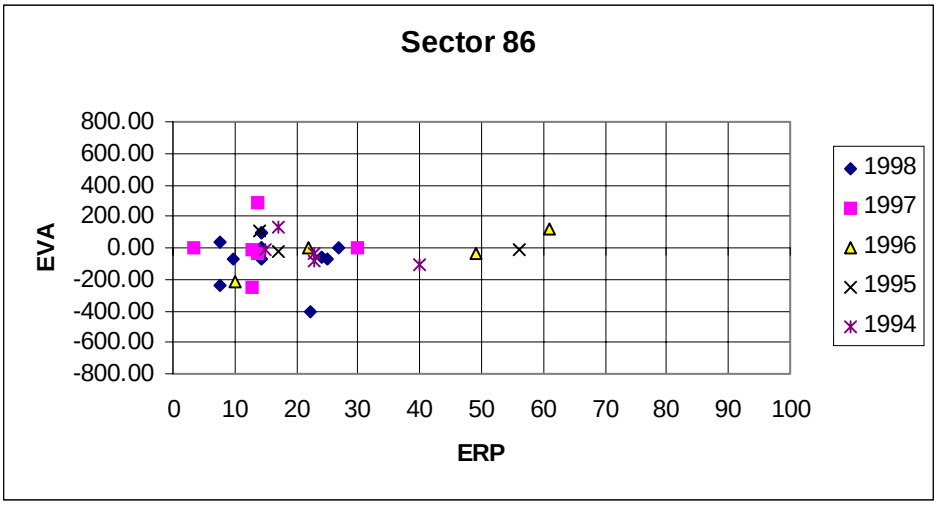
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