A STRATEGIC APPROACH IN MANAGING SHAREHOLDERS' WEALTH FOR COMPANIES LISTED ON THE JSE SECURITIES EXCHANGE SOUTH AFRICA

by

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Summary

For a number of years there has been a growing awareness of the importance of shareholder value for financial strategy and management. At the same time, there has been growing concern that the traditional accounting measures of performance have serious inherent limitations that may lead to poor financial decision-making. This study starts off by providing an overview of the main accounting earnings-based measures, as well as the most important criticisms leveled against them.

The concepts of Economic Value Added (EVA) and Market Value Added (MVA), which are currently regarded as the most important indicators of shareholder value and financial performance, are examined, along with some research evidence supporting them (and other evidence opposing them). Various aspects of EVA and MVA are discussed, including different ways of calculating them, and their link to other financial concepts such as net present value (NPV) and operating and financial leverage.

After a discussion of the main drivers of EVA, namely the Return on Invested Capital (ROIC), the weighted average cost of capital (WACC), the performance spread and the invested capital (IC), the financial strategy matrix is introduced. The financial

strategy matrix has been used in this study to evaluate companies in terms of internal value creation (performance spreads) and cash flow management (sales growth compared to the sustainable growth rate). A selection of companies listed on the JSE was ranked according to their relative performance in terms of internal value creation (performance spreads) and the results of some individual companies and sectors were placed on the financial strategy matrix.

The statistical tests done on the data have indicated that the sales growth minus the sustainable growth rate does not contribute significantly to shareholder value and an alternative variable was recommended. Further tests have revealed that significant correlation between MVA and EVA could only be found if the median results over a ten-year period were used. The correlation between MVA and the main drivers of EVA was found to be weak on a year-on-year basis.

It is hoped that the results and perspectives gained from this study will be helpful to financial managers who aim to optimize their approach to shareholder value management.

LIST OF ABBREVIATIONS

AEVA	Adjusted EVA
APT	Arbitrage pricing theory
BFA	Bureau for financial analysis
CAOA	Cash flow from operating activities
CAPM	Capital asset pricing model
DFL	Degree of financial leverage
DOL	Degree of operating leverage
EAT	Earnings after tax
EBIAT	Earnings before interest after adjusted tax
EBIT	Earnings before interest and tax
EBITDA	Earnings before interest, tax, depreciation and amortisation
EBT	Earnings before tax
EMH	Efficient market hypothesis
EPS	Earnings per share
EVA	Economic value added
FAT	Fixed asset turnover
FCF	Free cash flow
FGV	Future growth value
FIFO	First-in-first-out
GAAP	Generally accepted accounting practice
IC	Invested capital
IC_{beg}	Invested capital beginning of year
IRR	Internal rate of return
IT	Information technology
JSE	Johannesburg Securities Exchange South Africa
LIFO	Last-in-first-out
MVA	Market value added
NI	Net income
NOPAT	Net operating profit after tax
NOPLAT	Net operating profit after adjusted tax

NPV	Net present value
PAT	Profit after tax
P/E ratio	Price earnings ratio
PV	Present value
R&D	Research and development
ROA	Return on assets
ROCE	Return on capital employed
ROE	Return on equity
ROIC	Return on invested capital
RRR	Real rate of return
SGR	Sustainable growth rate
SPM	Strategic performance measurement
SVA	Shareholder value analysis
TDL	Total degree of leverage
WACC	Weighted average cost of capital

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INTRODUCTION

1.1 BACKGROUND

There is general consensus that the main financial objective of a business enterprise is to maximize the wealth of its shareholders. However, it is also widely recognized that various other stakeholder groups, such as customers, management, employees, creditors, banks and government, have their own objectives, which can be of a financial and/or non-financial nature. The stakeholders that make up this “coalition of constituents” have different levels of influence. It is obvious that the stakeholder group that has the most power influences the objectives of a company most. The most influential stakeholder group is usually senior management, which is appointed and dismissed by the shareholders via a board of directors.

Without diverting too much attention to the ongoing debate regarding a “shareholder versus a stakeholder approach”, it is clear that the financial objectives of any company need to tread a delicate balance between the interests of all the stakeholder groups. However, the prerogative ultimately lies with the shareholders, who in a free market always have the option of withdrawing their invested capital and putting it in other investments which will yield returns that will compensate them better for the risk they are taking.

It is generally accepted that financial objectives should be related to key factors for business success. These include, according to ACCA (ACCA Study Text 1999:8),

- profitability (return on investment);
- market share;
- growth;
- cash flow;
- customer satisfaction;
- the quality of the firm's products;
- industrial relations; and
- added value.

Even if a company endeavours to satisfy the needs of a wide range of stakeholders, it cannot be denied that the single most important financial objective of the company is to maximize the wealth of the shareholders. The wealth of the shareholders is maximized when the returns of the shareholders, relative to their investments, are maximized. These returns are made up of capital gains in the form of increases in the share price, as well as of dividends, which are made possible when the company generates adequate distributable profits (and cash flows).

The utility values of dividends (the value to a specific person or institution) differ widely among different shareholders. Some investors with a long-term perspective are adamant that dividends should only be paid if the company has no other value-enhancing capital projects to invest in. Consequently, the market value of the (ordinary) shares of a business is seen as the main indicator of shareholder wealth. To be even more specific, it is not the absolute size of a business in terms of its market value alone, but the amount by which the market value of the business as a whole exceeds the capital invested in it – the so-called Market Value Added (MVA) – that is the most appropriate external financial measure of shareholder wealth. If the share price is available, the MVA can be calculated easily.

If one knows what is important to the shareholders and also how to measure that which is most important, the next question that needs answering is what a company can do to maximize this external measure of value, MVA. It is well known that MVA is driven by increases in share prices, which, in turn, are driven by expectations based on external factors over which the company has no control (such as exchange rates, inflation rates, the changing needs of customers, changes in tax rates and political instability) and internal factors which management can control more easily, for example by investing in assets and incurring costs that lead to profits and cash flows.

Over the years, a number of financial accounting indicators have been used as internal measures of performance that drive shareholder value. Typical measures that were used were profits after tax (PAT), total earnings and earnings per share (EPS), return on assets (ROA) and return on equity (ROE). Each of these has its merits, but in recent years all of them have been strongly criticized for all having the same flaw, namely that they do not reflect the cost of own capital (equity).

Furthermore, the profit-based measures, such as total earnings and EPS, have come under fire on account of the fact that they “do not take into account the balance sheet”, in other words, that they disregard the value of the assets used to generate them. In order to overcome the criticism against the abovementioned measures, numerous authors have suggested that a new, improved measure of internal performance that takes into account the full cost of all long-term capital, the so-called Economic Value Added (EVA), must be used.

EVA is not an entirely new concept. It is similar to the “residual income” measure, which has been used for a number of years for performance measurement and evaluation. EVA calculates an economic profit, which takes into account the full cost of capital of all long-term sources of capital invested in the business, including the cost of own capital, or equity. The concepts of EVA and MVA have been popularised and marketed by the Stern Stewart Consulting Company and many top companies have implemented EVA performance measurement and employee incentive systems, both inside and outside the United States of America (USA), including in South Africa.

Although there is some evidence of correlation between EVA and MVA, there has also been a lot of criticism of EVA of late and the evidence supporting EVA as the best driver of MVA is still not significant enough to be considered conclusive.

The focus of this study was to place companies listed on the Johannesburg Securities Exchange (JSE) of South Africa on a financial strategy matrix, based on their ability to generate EVA and to manage sales growth (and cash). A relative measure of EVA, the so-called “spread”, was used, along with the difference between the actual sales growth of a company and its sustainable growth rate (SGR) as a measure of cash management. The spread is the difference between the actual return on assets and the cost of capital, and value is created when the actual return on assets is higher than the cost of capital.

Both individual companies and sectors were placed on the financial strategy matrix in order to identify trends over time for different periods between 1993 and 2002 and to suggest appropriate strategies towards value maximization, given a certain position on the financial strategy matrix. The financial strategy matrix was used as a strategic tool to regulate the optimal allocation and usage of scarce resources and to highlight opportunities to enhance value for shareholders. Furthermore, the main drivers of EVA were determined, as was their impact on shareholder value.

1.2 RATIONALE FOR THE STUDY

Some recent research has been done on the EVA of South African companies. Some models have been developed locally to determine the present value of future expected EVAs. There have also been several surveys ranking companies in terms of the biggest increases in their EVA. Hall (1998:165) used the data of listed South African companies for the period from 1987 to 1996 to determine the variables that drive EVA and to derive a statistical equation describing the relationship between these variables and EVA.

This current study is unique in the sense that it is the first to use a relative measure of EVA, the spread, to rank the performance of companies in South Africa. The spread (referred to on page four) is the EVA of a company divided by its invested capital (IC) at the beginning of the year. This makes it possible to compare the EVA performance of companies that differ considerably in terms of their size.

This study is also the first to place companies listed on the JSE of South Africa on a financial strategy matrix. The information content of the results enables any analyst to track not only a company's relative EVA performance in terms of spreads, but also its management of sales growth and cash over time and to compare it with the performance of the sector in which it operates, or the performance of all other listed companies. This model acknowledges that the generation of EVA is important, and it also takes into account the cash management of a company. Bearing in mind that, on a worldwide scale, the majority of companies that close down do so because of cash flow problems rather than because of a lack of profits, this aspect is very important.

In contrast to the studies of Hall (1998:165) who used a large number (19) of independent variables to test their impact on EVA, this study uses only the six most important drivers that make up EVA, to test their impact on MVA. The outcome with regard to this facet of the study could prove helpful to managers who want to determine which components of EVA (such as profitability relative to sales, or sales relative to assets, for instance) contribute most towards increases in MVA. It is obvious that the components with the highest "leverage" would be the ones that should receive top priority from management.

1.3 RESEARCH OBJECTIVES

The main objectives of this study revolve around providing a strategic approach for the analysis and evaluation of companies and sectors to assist them in implementing optimal strategies in order to maximize shareholder wealth. The study and pursuit of measures of performance that drive shareholder value has been going on for a long time, and it still carries on unabatedly. Recent events such as the Enron disaster in the United States of America highlight the fact that an undue focus on accounting profits and EPS, rather than on economic profits like EVA, could lead to poor decision-making, with unfortunate consequences (Stewart 2002:1). Ever-increasing and intense competition is a constant reminder of the need for companies to use performance measures linked to shareholder value. In order to make a real impact on a business, a value-driven culture needs to be fostered at all levels of management. This can only be accomplished if management incentives are linked to EVA.

The first objective of this study was therefore to do research aimed at establishing a firm theoretical background and understanding of

- the nature and weaknesses of existing accounting performance measures;
- other economic measures of performance, such as EVA; and
- why EVA is considered to be superior to accounting-based measures.

The ranking of companies in terms of their relative EVA performance (spreads) has identified the top-performing companies in South Africa. A second objective of the study was to determine the benefits of placing locally listed companies and the averages (actually medians) of the sectors in which they operate, on a financial strategy matrix for a given year, or over a period of time. It was anticipated that movements over time (trends) would be helpful in determining the strategies most appropriate for a given company.

A next objective was to test the validity or strength of the financial strategy matrix by means of statistical tests that evaluate the impact of the size of positive spreads and the sales growth minus the SGR percentage have on different measures of shareholder value such as MVA.

Finally, the study explored the effect that the six main drivers of EVA, namely profitability, asset turnover, cash tax rates, the cost of capital, the invested capital and the expected growth in EVA, have on MVA. This exploration has led to guidelines for the management of specific companies regarding the variables that have the greatest impact (leverage) on value.

1.4 LITERATURE REVIEW

In recent years, there has been a growing chorus of criticism against the use of popular accounting indicators as measures of financial performance. Measures such as PAT, EPS, ROA and ROE have come under fire from various authors, including Rappaport (1986:43), Stewart (1991:2), Stern (1993:36), Copeland, Koller and Murrin (1996:105) and Ehrbar (1998:161). The main arguments against these accounting measures are that the profit-based measures ignore the amount of the investment as reflected in the balance sheet and that none of them show any link to the market values of the companies concerned.

The criticism of these accounting measures has given rise to the development of other economic methods of value determination. Rappaport (1986) was one of the leading proponents of this endeavour, with his Strategic Shareholder Analysis (SVA). Rappaport used the free cash flow valuation approach, linked to strategic management principles, to identify and manage the main drivers of shareholder value.

Copeland, *et al*. (1996:149) put forward the economic profit model, which states that not only recorded accounting expenses that should be taken into account when determining whether a company has created value, but also the opportunity cost of capital used in the business. The economic profit model effectively incorporates the cost of own capital (which is missing from the accounting profit model) and gives a result very similar to EVA.

Some authors have defined EVA and MVA and provided different ways of calculating these indicators. This group includes Stewart (1991:153), Firer (1995:57), Stern, Shiely and Ross (2001:394) and Reilly and Brown (2003:591). The next main thrust of theoretical research focused on research evidence in support of EVA as a driver of MVA. A host of authors have published work supporting EVA. The most noteworthy of these are Stewart (1991:118), Finegan (1991:36), Stern (1993:36), Lehn and Makhija (1996:36), Uyemura, Kantor and Pettit (1996:98), Ehrbar (1998:6), Makelainen (1998:15), Milano (2000:119), Hatfield (2002:41), Stewart (2002:4) and Singer and Millar (2003:6).

In the wake of all the publications extolling the virtues of EVA, there have also been many authors who criticize EVA. Some have even provided research evidence showing that some accounting measures linkup better with market value than EVA does. This group includes De Villiers (1997:285), Kramer and Pushner (1997:41), Makelainen (1998:21), Biddle, Bowen and Wallace (1999:69), Brealy and Myers (2000:329), Keef and Roush (2002:20), Ramezani, Soenen and Jung (2002:56), Paulo (2002a:53), Ooi and Liow (2002:29) and Copeland (2002:51).

To date, relatively little research on EVA and MVA has been done in South Africa. De Villiers (1997:285) has investigated the application of EVA under conditions of inflation and has suggested that an adjusted version of EVA, allowing for inflation, be used. Hall (1998:165) used companies listed on the JSE for the period from 1987 to 1996. He researched and identified the components (drivers) of EVA and employed stepwise regression analysis to develop a model that can help to increase EVA most efficiently. Eedes (2001:1 and 2002:1) has reported on surveys ranking companies listed on the JSE in terms of the amount of EVA generated over the past year. He also discussed the splitting of EVA in terms of a current operating value (COV) and a future growth value (FGV) and suggests the use of the FGV to determine whether a company is under- or overvalued.

1.5 LIMITATIONS OF THE STUDY

If the requirements of recency and accessibility of data were to be met, clear limitations needed to be specified. For this study, it was decided to use the data of companies listed on the JSE and to exclude all unlisted companies. The reason for this is that it would be very difficult to obtain adequate data for unlisted companies, while the data for listed companies can be readily obtained from various sources. The McGregor's Bureau of Financial Analysis (BFA) at the University of Pretoria supplied the data for this study.

The time frame that was decided on was ten years. In order to use the latest available information, the data for the year 2002 was used as a starting point and then the other years were added on, working back to 1993. Where some of the data required for the study was not available for some companies in specific sectors, those companies were left out as well. A further criterion for inclusion was that the data for each company included in the final database had to be complete for each data item required for each year. The inclusion criteria also took into account that some variables may not be calculated with reasonable accuracy if the volume of trade in shares is not at a fair level. Therefore, companies with thinly traded shares were also excluded from the final list of companies used in the study.

The following is a summary of the criteria laid down for the inclusion of companies in the final database:

- all companies listed on the JSE were included in the initial database;
- companies in certain sectors were excluded due to the unavailability of some information;
- companies for which there was not complete information for the full ten-year period from 1993 to 2002 were excluded; and
- companies with thinly traded shares were excluded.

The 89 companies included in the final database, after all exclusions, provided the information upon which the calculations and statistical tests were performed.

1.6 OUTLINE OF THE STUDY

Each part of the study was conducted in a logical sequence and within a framework that allowed for natural progression from one topic to the next. The broad guidelines were first to research and describe all relevant aspects of EVA and MVA, while at the same time creating a platform for the empirical research to follow. The empirical research on the data of the selected listed companies was followed by statistical tests. Conclusions and recommendations were then made.

The remaining chapters of the study are briefly described below.

- Chapter 2 describes the weaknesses of traditional accounting measures of performance such as PAT, EPS, dividends paid, ROA and ROE. Some of the main reasons for the flaws in these measures are highlighted. This is followed by a discussion of the economic methods of value determination, namely net present value (NPV), shareholder value analysis (SVA) and the economic profit model. The chapter concludes with the observation that the economic methods are superior to the accounting methods because they take into account the full cost of capital used by a business.

- Chapter 3 introduces the concepts of EVA and MVA and cites various authors who support or criticize EVA as the main internal driver of MVA. Different ways of calculating EVA and MVA are discussed, as well as some of the most prominent adjustments that need to be made to the financial statements in order to be able to calculate EVA and MVA.

- Chapter 4 deals with the relationship between EVA, MVA and leverage. The effects of operational leverage and financial leverage on profits are discussed. The leverage effect of the cost of equity can be added when EVA and MVA are calculated, and the chapter illustrates how the impact of a certain percentage change in sales on EVA and MVA can be determined if it is assumed that all other factors remain constant.

- Chapter 5 describes the main components in the determination of EVA, namely the return on invested capital (ROIC), the weighted average cost of capital (WACC), the performance spread and the IC. All the factors that relate to the calculation of these components are discussed and explained.

- Chapter 6 first discusses sales growth and cash management. The indicator used to determine the level of cash management is the sales growth percentage minus the SGR percentage. Next, the financial strategy matrix is introduced and an illustration is given of how a company can be placed on the matrix in terms of value creation (spread) and cash management (sales growth percentage minus the SGR percentage).

- Chapter 7 contains the research design, as well as the first set of results of the empirical study, namely the rankings of companies in terms of spreads and the placement of three individual companies, all sub-sectors and all companies as a group on the financial strategy matrix. The placement of companies and sectors was done for specific years, as well as for the two five-year periods from 1993 to 1997 and 1998 to 2002, and for the ten-year period from 1993 to 2002.

- Chapter 8 covers the statistical tests, which can be grouped into two categories. The first group deals with testing the strength and significance of the factors used on the financial strategy matrix, namely the spreads and the sales growth minus the SGR percentage, relative to MVA and two adjusted versions of MVA. The second group of tests revolved around the determination of the impact (correlation) of the main drivers of EVA on MVA and two adjusted versions of MVA.

- Chapter 9 is the conclusion to the study and contains a final summary, as well as recommendations. It also suggests further possible areas of research.

1.7 CONCLUSION

In a global economy, where highly competitive business environments and diminishing trade barriers between countries and markets facilitate the free flow and migration of investors' funds, it is more important than ever before that companies are managed in terms of value to the suppliers of risk capital, the shareholders. Just like raw materials and labour, financial capital is a scarce resource that must be allocated and invested with care and managed with skill. It is therefore important for an investor to know, with a reasonable measure of accuracy, whether a business enterprise is creating value or destroying value and what the amount of the value created or destroyed is.

For a number of years, there has been a growing concern that the traditional accounting profit-based indicators appearing in financial statements no longer serve the purpose of sound financial decision-making. In the ongoing search for more appropriate performance measures that show some link with shareholder value, the EVA, which is similar to the economic profit of a company, seems to have emerged as a real improvement on the older accounting measures. EVA reflects performance by taking into account both the income statement and the balance sheet, in other words, both the returns and the invested amount. Furthermore, the EVA is determined after taking into account the full cost of capital (including the opportunity cost of own capital), leading to improved decision-making.

This study explores the benefits of using EVA and MVA as real indicators of value and applies these value-driven concepts to companies listed on the JSE of South Africa. The following chapters propose a strategic approach which will hopefully be helpful in improving the management of shareholder wealth in South African companies.

CHAPTER 2

WEAKNESSES OF ACCOUNTING INDICATORS AND ECONOMIC METHODS OF VALUE DETERMINATION

2.1 INTRODUCTION

One of the greatest challenges to be met in business is determining what drives share prices, and hence, shareholder value. In the pursuit of optimal business performance, it is vital to know what the drivers of wealth creation are and to manage them well. Business managers have always been on a quest for value, but views regarding the validity of certain indicators of value have changed dramatically over the last few years.

The usefulness of traditional accounting indicators as measures of performance is increasingly being questioned and criticized by investment analysts, academics and business leaders. This shift has resulted in vigorous efforts to determine the real drivers of shareholder value. Even in the early 1980's, traditional accounting measures as drivers or indicators of value were criticized by Johnson, Natarajan and Rappaport (1985:61) who commented: "…judgments about corporate excellence based solely on financial (accounting) performance criteria are occasionally misleading because commonly used measures of financial performance are often poor surrogates of economic performance."

Rappaport (1986:19) has explained the shortcomings of accounting measures, particularly earnings per share (EPS) and earnings per share growth, as well as return on investment (ROI) and return on equity (ROE). The earnings of a company were a very popular indicator of performance for a long time, and remain so today, but Rappaport (1986:48) comments: “Undue focus on reported earnings can lead to [the] acceptance of strategies that reduce value and rejection of strategies that increase value.”

Stern’s (1993:36) research has shown that popular accounting measures such as earnings, earnings growth, dividends, dividend growth, return on equity, and even cash flow cannot be regarded as appropriate measures of performance, because none of them correlate well with changes in the market values of the companies selected. Stern (1993:36) used the coefficient of determination, r^2, to measure the strength of the correlation between market value and several different independent variables. The measure r^2 indicates the percentage of changes in the dependent variable (y) that is explained by changes in the independent variable (x). His research, based on a sample of American companies, revealed that the r^2 between market value and turnover growth was 9% for turnover growth (lowest) and 25% for ROE rates (highest). (The full table of the accounting measures relative to changes in shareholder value for this sample is set out in Chapter 3 of this study.)

2.2 THE ACCOUNTING MODEL OF VALUATION

The accounting model of valuation has been used for a long time. It dictates that the value of a company’s shares is determined by a multiple of its earnings. The earnings attributable to ordinary shareholders are the net income after tax and after deducting preference dividends (if any). The multiple, or price/earnings ratio (P/E ratio), is calculated by using the market price per share and dividing it by the EPS. For valuation purposes, the multiple is assumed to remain constant.

A valuation of ordinary shares is therefore a “capitalization” of earnings and it is assumed that a change in earnings has a direct impact on the share price. For example, if the current ordinary share price of Company A is R20 and the EPS is R2, and then the P/E ratio is 10. If the earnings can be increased to R2,20, the share price is expected to rise to R22. Stewart (1991:22) claims that the appeal of this accounting model lies in its simplicity and apparent precision.

The main shortcoming of earnings as a driver of value lies in the unrealistic assumption that P/E ratios remain constant. In practice this is not so: P/E multiples change all the time, due to factors such as changes in companies' financial structures and financial policies, new investment opportunities, acquisitions and so on. Furthermore, earnings are reported according to the guidelines of Generally Accepted Accounting Practice (GAAP), which allows for the use of different accounting policies.

A focus on earnings leads to a manipulation of accounting policies that maximizes earnings. Some companies resort to a practice, called ‘‘trade loading” or “channel stuffing” to improve sales and earnings (Ehrbar 1998:68). This entails the shipping of goods that are not wanted on the distributors' premises to retailers near the end of a quarter (or financial reporting period), even though there is no consumer demand for the goods. Typically, the retailers normally do not pay for goods until they resell them and this means that additional debtors need to be financed, which in turn reduces the cash flow.

2.3 THE ECONOMIC MODEL

The economic model of value states that only two factors determine share prices and shareholder wealth, namely

- the cash the business will generate over its entire life; and
- the risk associated with those cash flows.

It is true that, for most companies, their earnings and cash flows move together most of the time. However, in order to determine which of the two, earnings or cash flows, has the most profound impact on shares prices, further investigation is required, as discussed in Section 2.4.

2.4 THE ACCOUNTING MODEL VERSUS THE ECONOMIC MODEL

The accounting model determines earnings by acknowledging realized income, by writing off expenses in the Income Statement and by deferring (or "capitalizing") capital expenditure in the Balance Sheet. By contrast, the economic model uses only cash inflows and outflows, irrespective of where these are recorded for accounting purposes. Where a company has a choice regarding the accounting treatment of certain items, substantial differences between earnings and cash flows may be noted. The best-known measures that cause earnings to be an unreliable indicator of wealth (and cause reported earnings to deviate from reported cash flows) are discussed below.

2.4.1 LIFO versus FIFO

A switch from a first in, first out (FIFO) to a last in, first out (LIFO) inventory valuation in times of rising prices causes lower profits (and earnings) and lower taxes to be recorded. The decrease in taxes is a cash benefit. However, an important question is how markets react to a decrease in earnings and an increase in cash flow. Accounting guidelines in South Africa do not allow this practice at the moment.

Empirical studies in the USA (Stewart, 1991:24) have found that companies that have changed from FIFO to LIFO experienced a 5% increase in share prices on the day when the change was first announced. Stewart (1991:24) mentions that a group of researchers have shown that the share price gain was in direct proportion to the present value of the taxes to be saved by making the switch. These studies strongly support the contention that cash generation dictates share prices, and not book earnings.

2.4.2 Amortisation of goodwill

“Goodwill” normally refers to any premium paid over and above the estimated fair (book) value of a seller’s assets. The amount of goodwill is usually written off (or amortised) against earnings over the period over which it is expected to yield future benefits, normally between five and 20 years in South Africa (or a maximum of 40 years in the USA). The amortisation of goodwill is not deductible for tax purposes and therefore does not affect cash flow. However, it is included in the accounting model because it lowers earnings.

In this regard, it is important to ask whether potential investors would turn down an acquisition due to the effect that the amortisation of the goodwill may have on future earnings, or whether they would look beyond the earnings and take a decision based on the expected cash flows. Walking away from a value-adding acquisition because of the expected negative effects of the amortisation of goodwill is a situation referred to by Stewart (1991:26) as “letting the accounting tail wag [the] business dog”.

In studies done in the USA (Stewart, 1991:26), where companies that amortised goodwill (using the so-called “purchase method”) were compared to those that did not (using the so-called “pooling of interests method”), no significant differences in the performance of the share prices of the two groups of companies were found. This provides further evidence that share prices are determined by expected cash generation, rather than by reported earnings. Stewart (1991:28) concludes that a company’s earnings explain its share price only to the extent that earnings reflect cash. Hence, he argues that earnings are misleading and should be abandoned as a basis for making decisions and for determining bonuses.

2.4.3 Research and development expenditure

Expenditure on research and development (R&D) can make up a large portion of the total expenditure of certain companies, for instance, “high-tech” organizations and pharmaceutical companies. Normal accounting practice is conservative in that it immediately writes off the research expenditure as an expense and either writes off the development costs immediately or writes them off over a number of years if certain criteria are met.

Writing off all or most of the R&D expenditure immediately causes earnings to be understated. From an investor's point of view, the benefits or payoff from an investment in research and development would be expected over the long term and therefore the expenditure should be treated as an investment. One could also ask whether unsuccessful R&D efforts should be written off immediately. Such an approach would cause the rates of return in financial periods following the year during which the expense was incurred to be overstated because the capital investment has been understated. In turn, this may lead managers to over-invest in projects or businesses that are not as profitable as they seem on paper.

Studies quoted by Ehrbar (1998:74) have shown that companies that announced planned increases in R&D spending saw immediate increases in their share prices, on average more than 1,4%. If the market does indeed capitalize R&D spending, it makes no sense to write off such spending immediately for accounting purposes.

To bring the accounting treatment in line with the investment approach, Ehrbar (1998:74) suggests that (all) the expenditure on R&D is capitalized in the balance sheet and written off against earnings over an "appropriate" period. The "appropriate" period would be the period over which the successful R&D efforts are expected to yield future benefits.

2.4.4 Deferred taxation

For accounting purposes, deferred taxation is classified neither as a reserve, nor as a liability. Consequently, it is shown separately in the Balance Sheet, between equity and liabilities. If a pessimistic view is taken, it can be argued that a company's financial situation may become so bad that assets need to be sold in order to repay debts. If this happens, the company has to pay tax on the recoupment of past tax allowances (those that gave rise to the deferred tax). In that case, treating deferred tax as a liability can be justified. Lenders to the company may hold this pessimistic perspective regarding deferred tax.

If, on the other hand, an optimistic approach is taken (for example, by the shareholders) it can be argued that as long as the company remains a going concern, the assets that give rise to the deferred tax provisions are replaced continuously. This means that the deferred tax is never paid. Hence, it is possible to classify deferred tax as a reserve and therefore as part of equity. The expectation that a business enterprise will remain a going concern in future tends to be shared by investors and accountants. In order to treat deferred tax as a reserve, the annual change in deferred tax needs to be added back to earnings. This ensures that a cash flow approach is taken, in that tax is only taken as an expense when it is paid (and not when it is provided for).

2.4.5 EPS

EPS is still a very popular performance measure among investment analysts. However, it has the same weaknesses as earnings itself. There are also several other characteristics of EPS that make it even more inappropriate as a reliable measure of performance than earnings.

A company that does not pay out all its earnings as dividends can expect an increase in EPS from one year to the next. This may be misconstrued as better performance. The problem is that the reinvested portion of earnings, with or without possible extra borrowings to maintain the capital structure, in fact leads to a bigger asset base, which in turn is expected to result in higher overall earnings and higher EPS.

Assume that Company A has total assets of R10m, financed only by equity consisting of 1 million ordinary shares issued. If the earnings for the year just ended are R2 million (earnings “return” of 20% on total assets), the EPS is R2 per share. If one also assumes that half of the earnings are paid out as dividends (and the other half is reinvested), the total assets at the beginning of the next year are R11 million. If the earnings rate of 20% on assets is repeated, the earnings are R2,2 million and the EPS increases to R2,20, without any real improvement in performance. The increase in EPS from R2 to R2,20 would be due to growth in assets and not to better performance. An astute analyst should be aware of the risk of using EPS as a measure of performance, which could be misleading.

There is another situation where changes in EPS may be (wrongly) interpreted as an improvement or deterioration in performance. It happens when one company acquires another and where the P/E ratios of the respective companies are quite different, and the purchase price of the shares in the target company is paid by an issue of shares in the company making the acquisition (a share exchange). Even if no synergy advantages are expected from the takeover, the EPS of the newly formed group as a whole changes.

Assume that Company A has 2 million issued ordinary shares with a current market price of R10 each (total market value R20 million) and its total earnings per year are R2 million (an EPS of R1 and a P/E ratio of 10). Company B has 1 million issued ordinary shares with a current market price of R5 (total market value R5 million) and its total earnings per year are R1 million (an EPS of R1 and a P/E ratio of 5). If Company A takes over Company B, it needs to issue 500 000 shares at R10 each to the shareholders of Company B. The number of new issued ordinary shares will be 2,5 million and the combined earnings (without synergies) is R3 million, giving a new EPS of R1,20. If the market does not perceive any changes in value due to the takeover, the combined market value is R25 million, giving a new P/E ratio of 8,33. The increase in EPS may look attractive to the existing shareholders of Company A, but they need to be bear in mind that the quality of the earnings of the combined company, as reflected in the P/E ratio, has declined (from 10 to 8,33).

In a situation where Company B takes over Company A, Company B needs to issue 4 million ordinary shares at R5 per share (a purchase price of R20 million) to the shareholders of Company A. The total number of ordinary shares issued is then 5 million; with combined earnings of R3 million (as above), giving a new EPS of R0,60. The new P/E ratio is also 8,33 (R25 million ÷ R30 million). In this situation, the shareholders of Company B may not be satisfied with the potential decrease of the EPS from R1 to R0,60, but they should not overlook the fact that the quality of the earnings of the combined company, as reflected by the P/E ratio, has improved from 5 to 8,33.

From these examples it can be concluded that one should not be fooled by the expected changes in the EPS when the acquisition of another company is considered. Irrespective of which company takes over which (whether Company A takes over Company B or *vice versa*), the newly formed combined company will be the same in terms of assets, earnings, risks and value. The direction in which the takeover is done should not affect the value of the new group. From an economic point of view, all that matters is whether the value acquired is more than the value sacrificed to pay for the acquisition. The transfer of earnings as indicated by the change in EPS (up or down) should not dictate the decision whether to take over a company. Clearly, focusing on EPS as a measure of performance or value creation could lead to misguided decisions.

2.4.6 Earnings growth

When considering two companies with identical earnings and similar expected growth rates (in earnings), one might be inclined to reason that they would have similar P/E ratios and therefore similar share prices. This is not necessarily the case. It all depends on how the growth is achieved.

Growth attained by spending large amounts on assets and boosting sales by means of aggressive marketing could be unwise, because such policies could result in high levels of inventory and debtors. Such an approach would indeed lead to growth in sales and earnings, but only for a limited time. The build-up of inventory and debtors eventually causes the rate of return on assets to drop. New share issues (probably rights issues) and increased debt financing would inevitably be needed in order to keep up this growth and to counter increasing cash flow problems.

If, on the other hand, growth is accomplished by more efficient use of capital investments, the growth would be sustainable and should lead to a higher share price (and P/E multiple) for a company growing in this way. On its own, earnings growth as a performance measure does not pass the test of a reliable indicator of value. To summarize, growth only adds value if it is accompanied by adequate returns.

2.4.7 Dividends

Contrary to popular belief, dividends, whether as an absolute amount paid, or as dividend growth, do not play an important role in the determination of value. The well-known Gordon growth model of share valuation (Lintner, 1962:247; Correia *et al*. 2003:237; Gitman, 2003:326) was based on the assumption that the value of ordinary shares is determined by future dividends.

This model suggests that for a minority valuation, only future dividends matter and therefore any expected changes in future dividends would cause a change in the value of the shares. The arguments supporting the relevance of dividends were linked to the so-called “signaling theory”, which held that changes in the dividends paid by a company would send, or signal, some information about the future prospects of the company to shareholders.

Research by Professors Miller and Modigliani (1961) has shown that under perfect market conditions (where there are rational investors, no taxes and no transaction costs), the payment of dividends is irrelevant and that the value of a company is unaffected by the payment of dividends. They have concluded that the value of a company is determined purely by the earning power and risk of its assets and that the way in which it splits its stream of earnings between dividends and internal re-investment does not affect that value.

The economic model supports the view that dividends do not have any noteworthy impact on the share value of a company. Paying dividends is seen as an acknowledgement by management that it cannot find enough profitable projects in which to invest all of the company's available funds (cash). It is argued that companies should only pay out dividends if they have no more suitable capital projects to invest in (the so-called "residual approach") and that shareholders can "make" their own dividends by selling some of their shares (or adding more cash-yielding investments in their portfolio) when they need cash.

However, it must be admitted that dividend announcements have often had a significant effect on share prices in the past. The explanation given by those who support the economic model is that share prices did not move because of the change in dividends, but because of some other event (like the expected collapse of a certain market). Therefore the model does not deny the historical correlation between dividends and share prices, but it argues that this correlation is not a causal relationship (the change in dividends does not cause the change in the share price). In support of the economic model, Stewart (1991:54) comments on the irrelevance of dividends as follows: "So long as there is a sufficient number of investors with sufficient wealth who are not seeking dividends, companies that pay few or no dividends have no cause for concern. Their stocks will sell for their fair value."

Black and Scholes (1974:21) found in their research that the return to investors was explained by the level of risk and was not affected by how the return was divided between dividends and capital gains. They concluded that investors would be better off if they assumed that dividends do not matter in the choice of shares to be included in their investment portfolio. Factors such as value, risk, taxes and diversification should be taken into account by investors, but not dividends *per se*. Black and Scholes (1974:21) advise the management of companies not to formulate dividend policy in order to influence the returns to shareholders. The dividend policy should instead be chosen according to the company's own investment needs and financing options.

2.4.8 ROE

A perennial favourite overall corporate performance measure is ROE. It is calculated by taking the net income after tax (earnings) of a given year and dividing it by the book value of equity (ordinary shares) at the beginning of the year. Alternatively, the average equity can be used. Equity would consist of the issued ordinary share capital, plus the share premium and reserves.

The calculation of ROE can be broken up into three separate ratios, as follows:

$$\text{ROE} = \frac{\text{Earnings}}{\text{Sales}} \times \frac{\text{Sales}}{\text{Assets}} \times \frac{\text{Assets}}{\text{Equity}}$$

The three components, or ratios, can be described (in sequence) as profitability, asset turnover and financial leverage. The ROE can therefore be improved by improving profitability, by using assets more efficiently and by increasing financial leverage.

One important problem with ROE is that the flaws inherent in earnings also affect ROE. Furthermore, the book value of equity is not a good approximation of the capital invested into the company, because it needs to be adjusted for the same reasons that adjustments must be made to earnings (as discussed in Sections 2.4.1 to 2.4.4).

ROE is very sensitive to changes in financial gearing. ROE increases with more financial gearing, as long as the returns earned on the borrowed funds exceed the cost of the borrowings. The danger inherent in increasing the financial gearing beyond a certain level is that the increased financial risk may cause the value of the company (and the share price) to drop. Pursuing higher ROE's may lead to wealth destruction, which is obviously not in line with the economic principles of shareholder value creation.

Rappaport (1986:43) has pointed out that the second component of ROE (as shown above), namely asset turnover, is affected by inflation in such a way that it may increase even when assets are not utilized better. He reasons that sales immediately reflect the impact of inflation, whereas the book value of assets, which is a mixture of new and older assets, does not adapt as quickly to the effects of inflation.

Rappaport's (1986:43) studies in the 1970's revealed that although the earnings of Standard & Poor's 400 companies decreased dramatically during the 1970's, their ROE's actually increased through increased levels of asset turnover and gearing. The markets, however, were not misled by this apparent "better performance". Consequently the market returns during this period were generally very poor, or "dismal", according to Rappaport.

Copeland *et al*. (1996:105) argue that ROE is a short-term performance measure and that too much focus on it can lead a company to overlook long-term growth opportunities that might increase shareholder value. A company may also be able to improve its ROE, while at the same time earning a return that is below its WACC, and thereby destroy value.

2.5 ECONOMIC METHODS OF VALUATION

In contrast with the accounting model of valuation based on earnings and its inherent flaws, as discussed in the preceding sections of this chapter, there are a number of economic models that emphasize cash flows, rather than profits, in the estimation of value. These economic methods have been widely used with varying levels of success. The models discussed here are the NPV approach, SVA and economic profit.

The continuous quest for value has led to critical evaluations of existing accounting measures of performance. As a result there is now a greater emphasis on economic profits, than on accounting profits. This shift has led to new insights and the refinement of existing methods. The process has culminated in the advent of EVA and MVA (as discussed in Chapter 3) as valuation models.

2.5.1 NPV

The NPV method is widely acknowledged to be the best approach to evaluating capital investment projects (Weston and Copeland 1992:313, Ross *et al*. 1996:200, Brealy and Myers, 2000:73, Correia *et al*. 2003:298). As a first step, an appropriate risk-adjusted discount rate is determined. For projects which pose normal risk this “cut-off” rate is the WACC, which usually consists of two components: own capital (equity) cost and borrowed capital cost. If the present value of all future net cash inflows over the estimated life of the project (discounted at the appropriate cut-off rate) is more than the initial outlay, the NPV is positive, and implementing the project should add value to the company (if the anticipated estimated cash flows materialize).

A company can be seen as consisting of a combination of current and future capital investment projects. Therefore the value of a business can be expressed as a current invested capital plus all future NPV’s to be generated by the company for as long as it exists. Although the NPV approach is highly recommended for capital investment decision-making, because it encourages maximization of shareholder value, it is of little value in performance measurement.

Very few companies track actual cash flows in relation to specific projects and compare these cash flows to the estimated cash flows on which the decision to invest was based. Furthermore, the NPV approach also has strong limitations as a method of valuation because it is almost impossible to know beforehand what capital projects a company may embark on in future, let alone estimate the associated cash flows.

2.5.2 SVA

SVA was originally developed and introduced by Rappaport (1986). His point of departure was that a company can be seen as consisting of a portfolio of capital investment projects. In order to maximize shareholder wealth, the future cash flows to be generated by these capital investments need to be estimated and maximized, while taking into account the risks involved. After the value of the business as a whole has been determined, the part of the value available to the shareholders is calculated as follows:

Shareholder value = Total business value – Market value of outstanding loans

The total business value is determined by the so-called "free cash flows" (FCFs) of the organization, discounted at the WACC. It is suggested that the expected future free cash flows of the business be estimated over a "planning horizon" of ten years or so and that a "residual value" (or terminal value) be estimated for the end of the planning horizon. The present value of the free cash flows over the planning horizon plus the present value of the residual value would result in the value of the business as a whole. The value available to ordinary shareholders can then be calculated by subtracting the market value of debt.

So, for example, assume that Company X has had sales of R400 million during the past year and the operating profit margin is 30% of sales. The depreciation charges for the year were R20 million and the cash tax rate for the year was 25% of the operating profit. During the year, R20 million was spent to replace fixed assets, while another R36 million was invested in additional fixed assets. A further R28 million was invested in additional working capital.

The free cash flows of the company can be calculated as follows:

	R million	R million
Sales		400
Operating profit (30% x R400 million)		120
Add Depreciation charge		20
Operating cash flows		140
Less Cash tax (25% x R120 million)		30
Operating cash flows after tax		110
Less Replacement of fixed assets	20	
Additional fixed assets	36	
Additional working capital	28	84
Free cash flows		26

When the reasonable assumption is made that the depreciation charge added back (an inflow of R20 million) is the same as the replacement cost of the fixed assets (an outflow of R20 million), the calculation of the free cash flows can be shortened to exclude these two items. The key variables or drivers of free cash flows can then be identified as

- sales;
- the operating profit margin;
- the cash tax rate;
- the additional investment in fixed assets; and
- the additional investment in working capital.

It is clear that key business decisions, namely operational, investment and financing decisions, all have an impact on these value drivers. In order to extend the example above to determine the value available to shareholders, some further assumptions need to be made.

So, for example, assume that the WACC is 20% and the planning horizon is five years. The terminal value of the business after five years is estimated at R300 million and the market value of borrowed capital is R60 million. The free cash flows (FCF's) for the next five years are as follows:

	year 1	year 2	year 3	year 4	year 5
	R million	R million	R million	R million	R million
Free cash flows	22	24	26	29	32

The value of the business as a whole can then be calculated as follows:

Total business value = $\sum[Cf_t/(1 + WACC)^t]$ + Residual value/$(1 + WACC)^5$

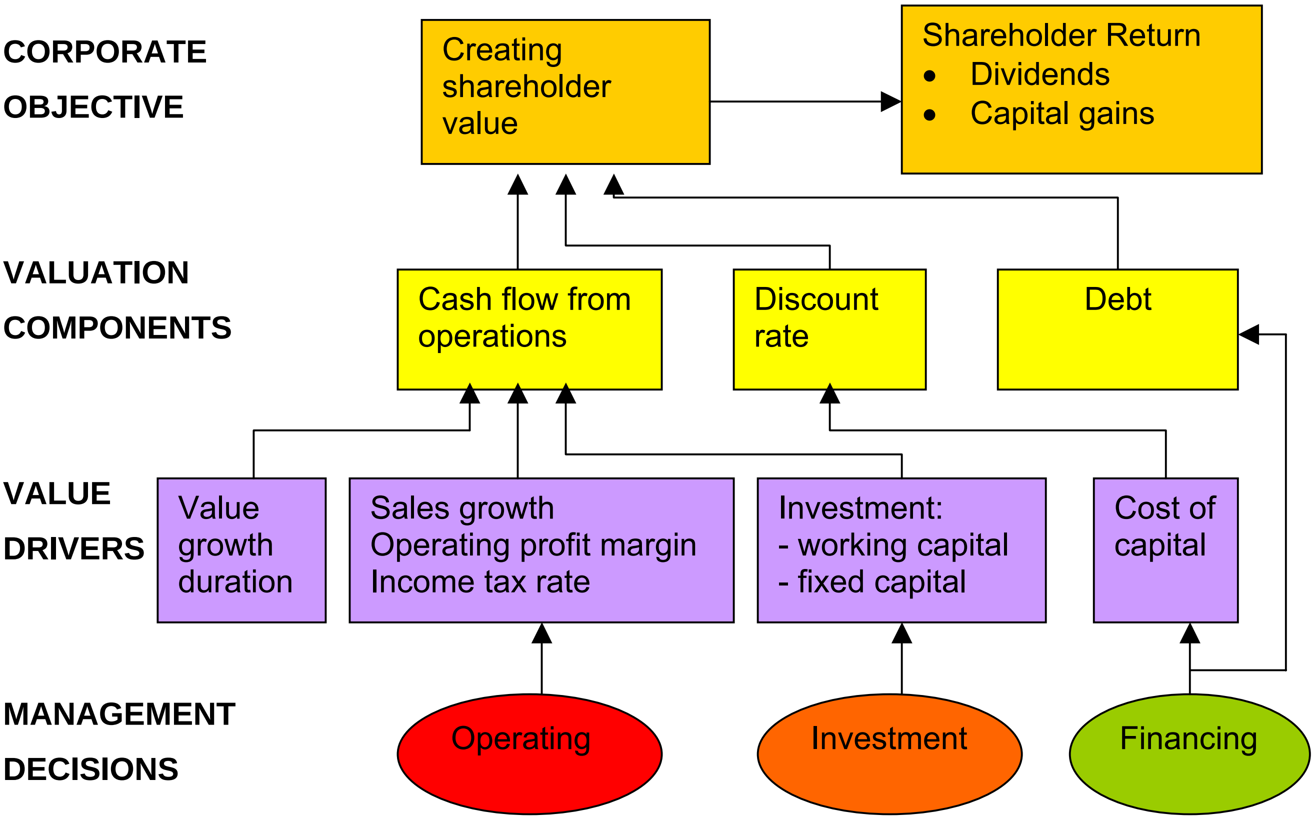
	R million
Total business value	197,46
Less Market value of debt	60,00
Shareholder value	137,46

SVA is of great value when important decisions that will have an impact on shareholder value are considered. Typical strategic decisions include

- acquiring new businesses;
- selling existing businesses;
- developing new products or markets; and
- reorganizing or restructuring the business.

Rappaport (1986:76) illustrates the link between shareholder value creation, value drivers and management decisions as set out in figure 2.1.

Figure 2.1: The Shareholder value network



Source: Rappaport (1986:76)

The work of Fruhan (1979:65) on shareholder value creation preceded the findings of Rappaport and provided a foundation for the principles of SVA. Fruhan (1979:65) recognized that the value of an investment is linked to its expected future cash flows and its cost of capital: "The economic value of any investment is a function of the future cash flows anticipated from that investment, and the cost of capital required to finance that investment."

Although SVA is radically different from the accounting measures of value creation, it provides a very helpful strategic framework to identify the value drivers in a business that have the biggest impact on shareholder value. Atrill and

McLaney (2002:316) comment: “If SVA is implemented, it can provide the basis of targets for managers to work towards, on a day-to-day basis, that should promote maximization of shareholder value.”

Apart from defining the SVA approach to value creation, Rappaport (1986) also linked SVA with a competitive strategy framework along the lines of the framework developed by Michael E. Porter (1998) in his book *Competitive Strategy*. Furthermore, Rappaport (1986) extended the application of SVA to incorporate performance evaluation and executive remuneration as well.

The SVA approach, however, is not without its drawbacks. These include the difficulty of forecasting the future cash flows and determining the terminal value for the end of the planning horizon and the comprehensive information needed. The approach also does not provide a uniform performance measure which remuneration can be linked equitably to.

2.5.3 The economic profit model

The economic profit model described by Copeland *et al*. (1996:149) expresses the value of a company as the amount of capital invested plus a premium equal to the present value of the value created each year going forward.

The concept of economic profit dates back as far as 1890 when the economist Alfred Marshall (cited in Copeland *et al*. 1996:149) stated that the value created by a company during any period must take into account not only expenses recorded in its accounting records, but also the opportunity cost of the capital employed in the business.

Compared to the FCF model used in SVA, the economic profit model has the advantage that economic profit is a valuable measure of performance in any given single year. The problem with FCF is that it is affected by highly discretionary investment in fixed assets and working capital, which makes comparing actual FCFs with estimated FCFs in a specific year meaningless.

The formula for the determination of economic profit is the following:

Economic profit = Invested capital x (ROIC – WACC)

It shows that the economic profit is equal to the invested capital multiplied by the difference (or spread) between the ROIC and the cost of capital. If the invested capital of a company is R100m, the return on invested capital is 24% and the cost of capital is 20%, the economic profit is calculated as follows:

Economic profit = R100 million x (24% - 20%)
= R100 million x (4%)
= R4 million

The economic profit can be stated in another way. It is also the after-tax profit, less a charge for the capital used to earn those profits:

Economic profit = NOPLAT – Capital charge
= NOPLAT – (Invested capital x WACC)

where
NOPLAT = Net operating profit after adjusted tax

Using the same information as above:

Economic profit = R24 million – (R100 million x 20%)
= R24 million – R20 million
= R4 million

What is clear from this approach is that the economic profit is almost the same as the net income, but with the difference that there is a charge for all the capital used, not only the interest on the debt.

The value of a business can be determined using economic profit as follows:

Value = IC + Present value of projected economic profit

From this definition of the value of a business, one can deduce that if the returns that a company earns on its assets are exactly the same as the cost of capital, there is an economic profit of zero, and the value of the business remains at the value of the amount invested. In other words, there is no value added.

If one looks at the example where the economic profit was calculated at R4 million, and one adds the assumption that it will remain the same in future, the present value of the economic profit can be calculated as a perpetuity as follows:

Present value of economic profit = R4 million / 20%
= R20 million, therefore

Value of the business = invested capital of R100 million
+ R20 million

= R120 million

It can be shown that the present value of the future expected FCFs gives the same answer:

Present value of FCF = R24 million / 20%
= R120 million

2.6 CONCLUSION

The helpfulness of accounting measures such as earnings, EPS, earnings growth, dividends and ROE has been criticized with growing intensity for some time. In a chapter entitled "Marketing Myths", Stewart (1991:66) remarks: "Earnings, earnings per share and earnings growth are misleading measures of corporate performance... Many investors are fooled by accounting shenanigans, but the investors who matter, are not."

Ehrbar (1998:161) clearly describes the growing ineffectiveness of accounting measures in determining value: "The association between accounting data and market values is not only weak, but appears to have been deteriorating over time. Overall, the fragile association between accounting data and capital market values suggests that the usefulness of financial reports… is rather limited… The widening gap, as it were, between GAAP and reality grows out of an extreme conservative bias in the accounting profession."

Rappaport (1986:43) is slightly less severe in his criticism of accounting measures, but still made the following point: "The demonstration here that accounting-based numbers such as earnings per share and ROI are not reliable indicators of shareholder value should not be interpreted as a failure of accounting. The problem lies not so much with accounting but rather its use by managers for unintended, inappropriate purposes." He also points out that the role of top management is to assess the relationship between investment now and the magnitude and timing of uncertain future cash flows. Decisions should not be influenced by arbitrary conventions that do not affect cash flow.

Stern (1993:36) points out that none of the popular accounting indicators pass the test of a reliable performance measure. He cites a survey which shows that not one of a selected number of accounting measures (including earnings and ROE) showed any significant correlation with changes in share value.

The most important criticism leveled at an earnings-oriented approach to value relates to the accounting treatment of various items that cause earnings to diverge from cash flows and lead to a general understatement of the amount invested in the assets of a company. What investors are most interested in is not necessarily profits, but the company's ability to generate future cash flows, as well as the risks associated with the projects undertaken to generate them.

Because of the inadequacy of accounting performance measures, finding new, reliable indicators of value creation is a top priority for researchers, business managers and investors. The prerequisites for a reliable measure of performance would have to include strong correlation with changes in share values, a cash flow approach, flexibility in application, measurability over different financial periods and the ability to be linked to manager performance evaluation and remuneration.

The following chapters endeavour to address and describe an appropriate performance measure of shareholder value, its application and its ramifications for top management in dealing with the process of share value maximization. Apart from generally simplistic, but popular accounting methods of valuation, there are a number of economic methods based on underlying cash flows rather than on profits. These economic methods include the NPV approach to capital investment decision-making and valuation, the SVA approach and the economic profit model.

The NPV method works very well when it is applied to capital investment decision-making. It is still regarded as superior to all other capital investment techniques, but it fails as a tool of valuation for an organization as a whole and as a performance measure.

SVA, first developed and introduced by Rappaport (1986), is based on the organization’s expected future FCFs, discounted at the WACC, which is adjusted for the risk involved. Rappaport has identified the main drivers of shareholder value and incorporated a strategic perspective into a strategic framework for the evaluation of management decisions regarding takeovers, mergers and the sale of some investments.

To date, SVA has proved its worth as a management tool. The criticism leveled at SVA revolves around the fact that too much uncertain information is needed to estimate future FCFs as well as the terminal value. Also, it does not provide an adequate performance measure on which to base executive remuneration.

The Economic Profit Model, as defined by Copeland *et al*. (1996), calculates the “actual” or economic profit after taking into account the full cost of all sources of capital used. It uses the WACC to determine a “capital charge”, which is subtracted from the profit before interest, but after tax. This incorporates an important correction of the accounting profit, which does not take into account the opportunity cost of own (equity) capital used.

In this chapter the weaknesses of the accounting measures of performance have been discussed, as well as some alternative measures of economic profits. In the next chapter, the concept of EVA (based on economic profits) and MVA are explored more fully.

CHAPTER 3

EVA AND MVA AND ADJUSTMENTS TO FINANCIAL STATEMENTS TO REFLECT VALUE CREATION

3.1 INTRODUCTION

The concept of economic profit was introduced in Chapter 2 and it was explained why it was preferred to accounting profit as a shareholder value performance measure. Applying this cash flow based view of performance measurement, the concepts of EVA and MVA were developed in order to reflect corporate performance more accurately. These two concepts are described and explained in this chapter. Different approaches or equations are used where possible in order to gain different perspectives on the subject, and the link between EVA and MVA is explained. The chapter shows that MVA is basically the present value of all the EVA that a company is expected to generate in future.

The discussion of EVA and MVA is followed by an overview of the latest research supporting EVA as the best internal determinant of MVA. After initial strong support for EVA and MVA, researchers and practitioners who argue that claims of the superiority of EVA and MVA are unfounded have increasingly begin to criticize these concepts.

A summary of the most important benefits of the implementation of an EVA system is given and in conclusion there is a discussion of some criticisms offered by different researchers and practitioners on EVA as a measure of shareholder value creation.

3.2 DEFINITION OF EVA AND MVA

A company's total market value is equal to the sum of the market value of its equity and the market value of its debt. In theory, this amount is what can be "taken out" of the company at any given time. The MVA is the difference between the total market value of the company and the economic capital (Firer, 1995:57, Reilly and Brown, 2003:591). The economic capital, also called IC, is the amount that is "put into" the company and is basically the fixed assets plus the net working capital.

MVA = Market value of company – IC

From an investor's point of view, MVA is the best external measure of a company's performance. Stewart (1991:153) states that MVA is a cumulative measure of corporate performance and that it represents the stock market's assessment from a particular time onwards of the NPV of all a company's past and projected capital projects. The MVA is calculated at a given moment, but in order to assess performance over time, the difference or change in MVA from one date to the next can be determined to see whether value has been created or destroyed.

EVA is an internal measure of performance that determines MVA. Stewart (1991:153) defines EVA as follows: "A company's EVA is the fuel that fires up its MVA." EVA takes into account the full cost of capital, including the cost of equity. The concept of EVA is a measure of economic profit and was popularized and originally trade-marked by Stern Stewart Consulting Company in the 1980's.

The calculation of EVA is very similar to that of the well-known "residual income" measure used as a benchmark of divisional performance for some time. Horngren, Datar and Foster (2003:790) and Garrison, Noreen and Seal (2003:616) compare EVA to residual income and other performance measures and describe the growing popularity of EVA.

EVA is calculated as follows:

$$EVA = (ROIC - WACC) \times IC$$

where

ROIC = Return on invested capital

WACC = Weighted Average Cost of Capital

IC = Invested Capital (at the beginning of the year)

The ROIC minus the WACC is also called the "return spread". If the return spread is positive, it means the company is generating surplus returns above its cost of capital and this translates into a higher MVA. Lehn and Makhija (1996:34) describe EVA as follows: "EVA and related measures attempt to improve on traditional accounting measures of performance by measuring the economic profits an enterprise – after-tax operating profits less the cost of the capital employed to produce those profits."

Millman (2003:40) refers to the difference between accounting profits and EVA as follows: "GAAP ignores the cost of capital, the money that stockholders have invested in a company. EVA, by contrast, measures success as delivering a return above the cost of capital."

EVA can also be defined as the difference between the net operating profit before interest, but after tax (NOPAT) and a capital charge based on the WACC multiplied by the IC:

$$EVA = NOPAT - (WACC \times IC)$$

The link between MVA, the cumulative measure, and EVA, which is an incremental measure, is that MVA is equal to the present value of all future EVA to be generated by the company.

$$MVA = \text{present value of all future EVA}$$

So, for example, Company Z has invested capital amounting to R100 million at the beginning of the year. This is financed by 60% equity and 40% debt. The debt has an interest rate of 12% before tax. The tax rate is 30% and the WACC 15%. The net income for the year before interest and tax is R30 million.

ROIC is R30 million / R100 million x (1 – tax rate of 30%) = 21%.

EVA = (ROIC – WACC) x IC
= (21% - 15%) x R100 million
= 6% x R100 million
= R6 million

Applying the second formula given for EVA, the result is the same:

EVA = EBIAT – (WACC x IC)
= R21 million – (15% x R100 million)
= R6 million

where

EBIAT = Earnings before interest, after adjusted tax

If the future EVAs are expected to remain indefinitely at R6 million per year, the MVA can be calculated as follows:

MVA = EVA / WACC
= R6 million / 15%
= R40 million

If the future EVA is expected to improve, the present value of the future improvement in EVA can be defined separately. For the majority of new companies, the biggest component of their current value will be the “future growth value” (FGV). Stern *et al*. (2001:214) define total value as follows:

Total value = Capital + PV (EVA)
= Capital + EVA/c + PV (Expected improvement)
= COV + FGV

where

PV	=	Present value
c	=	Cost of capital
COV	=	Current Operations Value
FGV	=	Future Growth Value

The formula above basically replaces MVA with the present value of future EVA and then splits the PV (EVA) into two components: the current portion of EVA added to invested capital to give COV and the future growth portion of EVA called FGV. This specific formula is useful when new companies are evaluated, as they may not necessarily have a high current EVA, but do have a high future expected EVA.

Adsera (2003:82) has suggested an adjustment to the EVA to value start-up companies that typically destroy value before they create it. He points out that these companies may be very valuable and that an appropriate valuation model should take into account changes in financial structure and a drop in the cost of debt once financial risk diminishes and the company matures.

Berry (2003:95) discusses the application of EVA in the IT environment where investments with an initial negative EVA, combined with strong expectations of a positive future EVA are typical. He points out the difficulty of quantifying and justifying the returns from IT investments in such a way that they are ”intellectually honest.”

The use of the formula Value = COV + FGV provides new insights regarding market expectations, because the market value of listed companies is available and their COV can be determined after calculating the current EVA. Eedes (2001:4) points out that if the market value is higher than the COV, this indicates that the FGV is positive and that the market has a positive expectation about future EVA growth.

This assertion is borne out by the example of the local company M-Cell, which had a market value of R46,9 billion on 31 December 2000. It had a COV of R7,8 billion and an FGV of R39,1 billion. The high (positive) proportion of the FGV relative to the market value of 83% indicates that the market had very high growth expectations for M-Cell's future EVA. In a follow-up survey by Eedes (2002:2), the FGV ratio to market value for M-Cell was found to be 63%. This was perhaps due to the increase in market price and an adjustment of market perceptions regarding M-Cell's future EVA growth.

Eedes (2001:5) also investigated companies with a negative FGV. He cites Sappi as an example of a company with a current positive EVA in 2001 and a large negative FGV. From this, he deduces that the market is not misled by a current positive EVA, but does indeed expect dramatic decreases in EVA in future.

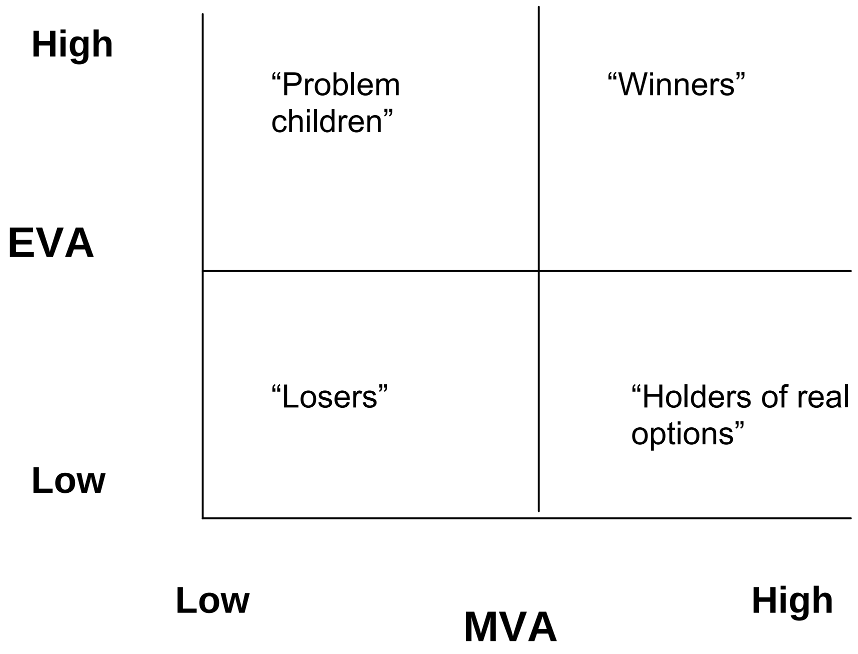
It can also be concluded from the discussion above that there are basically only three ways in which a company can increase its MVA (Stewart 1991:137; Ernst & Young 1994:10; Firer 1995:57; Davidson 2003:49):

- by making new investments in projects with a positive return spread (a positive EVA);
- by expanding current projects earning a positive EVA; and
- by scaling down or eliminating projects that have a negative EVA.

If a company is not operating at its optimal financial gearing level, the WACC can be lowered by changing the proportion of debt relative to equity, so that the capital structure is closer to optimal. This also unlocks value for the company as a whole, including shareholders.

Fatemi *et al.* (2003:14) have investigated the link between the remuneration of top management and EVA and MVA. They categorize companies according to their ability to generate EVA and MVA. Companies with a high EVA and MVA are called "winners", companies with a high EVA and low MVA are "problem children", companies with a low EVA and a high MVA are "holders of real options", and companies with a low EVA and MVA are typified as "losers". The four categories are set out in Figure 3.1.

Figure 3.1: EVA and MVA grid



Source: Adapted from Fatemi *et al*. (2003:14)

Fatemi, *et al.* (2003:14) have found that when EVA is achieved at the expense of MVA (the "problem children" group), there is a penalty in the compensation for top management.

3.3 RESEARCH IN SUPPORT OF EVA AS A DRIVER OF MVA

3.3.1 The pioneering studies of Stewart

According to Stewart (1991:215), financial analysts Stern Stewart & Co. started tracking the best 1000 industrial and services companies in the USA in 1989 after he had become disillusioned with the rankings of the magazine *Business Week* at the time. These rankings were based on market capitalization and not on performance. Stern Stewart & Co. began to rank companies based on MVA. As they had expected, the new rankings were dramatically different from the *Business Week* rankings.

Taking the Stern Stewart 1000 companies as a point of departure and eliminating some companies for various reasons, such as incomplete information, some research was performed by Stern Stewart & Co. on the EVA and MVA of 613 companies in the USA. The companies were ranked in terms of average EVA for 1987 and 1988. The study was based on the average EVA and MVA for each of 25 groups of companies (making up the 613), as well as on changes in EVA and MVA. The groups were made up according to the rankings in terms of average EVA.

The research found that for companies with a positive EVA, there was a very high level of correlation (as indicated by r^2) between the level of EVA and the level of MVA, both for the average values used and the changes in values. The averages (per group of 25 companies) of the 1987 and 1988 EVA values showed an r^2 of 97% relative to the 1988 MVA values. The relationship for the changes in values was even better than that for the average values.

For the groups of companies with a negative EVA, the correlation between the EVA and MVA levels was not as good. Stewart's (1991) explanation for this is that the market value of shares always reflects at least the value of net assets, even if the company has low or negative returns. The potential for liquidation, recovery, recapitalisation or a takeover sets a floor on the market value (in other words, the market value does not drop far below the net asset value).

3.3.2 Finegan's extensions of the EVA and MVA applications

Finegan (1991:36) extended the initial analysis discussed above to include other measures. He focused on the middle 450 companies (actually 467 companies out of the original 613) where the MVA's were "tightly clustered" and compared the exploratory power of EVA to that of more conventional measures such as EPS, growth in capital, return on capital and even growth in cash flow.

The results of the regression of MVA against EVA and other common performance measures showed that EVA outperformed the other measures quite considerably with an r^2 of 61% compared to the second best other measure, which was return on capital with an r^2 of 47%. The exploratory power of EVA was found to be six times better than that of growth in EPS.

Finegan (1991:36) then repeated the analysis on changes in MVA and again found EVA to be superior to the other measures. The r^2 of changes in EVA was 44% compared to an r^2 of 35% for changes in return on capital, which was the measure that came closest to EVA in terms of its explanatory power. In this analysis, the r^2 of EVA was about three times better than that of changes in EPS growth.

3.3.3 Stern's comparison of EVA with popular accounting measures

Stern (1993:36) argues that the key operating measure of corporate performance is not popular accounting measures such as earnings, earnings growth, dividends, dividend growth, ROE, or even cash flow, but in fact EVA. The changes in the market value of a selected group of companies (specifically their MVAs) were shown to have a relatively low correlation with the above accounting measures.

His research showed that the r^2 for the relationship between MVA and different independent variables ranged from 9% for turnover growth to 25% for ROE rates. In comparison, the r^2 for EVA relative to MVA was 50%. All the results were based on averages and they are set out in Table 3.1.

Table 3.1: MVA *vs*. other financial performance measures

Correlation with MVA:	r^2
EVA	50%
ROE	25%
Cash flow growth	22%
EPS growth	18%
Asset growth	18%
Dividend growth	16%
Turnover growth	09%

Source: Adapted from Stern (1993:36)

3.3.4 Lehn and Makhija's work on EVA, MVA, share price performance and CEO turnover

Lehn and Makhija (1996:36) conducted a study to find out how well EVA and MVA relate to share price performance and also to see whether chief executive officer (CEO) turnover (the number of new CEOs during a given period) is related to EVA and MVA. They selected 241 large US companies and gathered information about them for the four years 1987, 1988, 1992 and 1993. About two thirds of the companies were operating in the manufacturing industry.

Six performance measures were computed per company for each of the four years, namely three accounting rates of return; ROA, ROE and return on sales (ROS), share returns (dividends and changes in share price) and EVA and MVA.

Both EVA and MVA were expressed as ROE values. All six measures showed a positive correlation with share returns. EVA showed a slightly better correlation with share returns than the other measures.

Their findings regarding EVA, MVA and CEO turnover revealed that the CEOs of companies with high EVAs and MVAs have much lower rates of dismissal than CEOs responsible for low EVAs and MVAs. As expected, a strong inverse relationship was found between share prices and CEO turnover. The CEO turnover rate for companies with share returns above the median was found to be 9,6%, compared to a 19% turnover for companies with share returns below the median.

In their study of the relationship between EVA, MVA and corporate focus, Lehn and Makhija (1996:36) differentiated between companies that focus on their core business and ones that diversify and become conglomerates in the hope of exploiting economies of scale. Their research showed that companies with an above median focus earn an average share return of 31,2%. Firms with a below median focus earn 25%. These findings prove that a greater focus on business activities leads to higher levels of EVA and MVA.

Lehn and Makhija (1996:36) have concluded that EVA and MVA are effective performance measures that contain information about the quality of strategic decisions and serve as signals of strategic change.

3.3.5 O'Byrne's findings on EVA's link to market value and investor expectations

O'Byrne (1996:119) used nine years of data (for the period from 1985 to 1993) for companies in the 1993 Stern Stewart Performance 1000 to test the exploratory power of capitalized EVA (which is EVA divided by the cost of capital), NOPAT, and FCFs relative to market value divided by IC. Initial findings showed that FCF explained 0% of the change in the market value divided by the capital ratio, while the r^2 was 33% for NOPAT and 31% for EVA. It looked as if NOPAT and EVA had almost the same explanatory power.

Two adjustments were made to the original model. The first adjustment allowed for the fact that the EVA multiples were bigger for companies with a positive EVA compared to companies with a negative EVA. The second adjustment allowed for different capital multiples for different capital sizes, in other words, a bigger multiple was used for companies with more invested capital. This adjusted model showed that EVA explained 31% of the variance in market values, compared to the 17% explained by NOPAT.

After making a further adjustment by analysing the changes in the variables, changes in EVA explained 55% of the five-year changes in market value, compared to the 33% explained by NOPAT. The corresponding figures for ten-year changes in market value were 74% explained by changes in EVA compared to 63% explained by NOPAT.

O'Byrne (1996:119) concluded that EVA, unlike NOPAT or other earnings measures, is systematically linked to the market value and that EVA is a powerful tool for understanding the investor expectations that are built into a company's current share price.

3.3.6 Uyemura *et al*.– EVA and wealth creation

Uyemura *et al*. (1996:98) used a sample of the 100 largest USA banks for the ten-year period from 1986 to 1995 to calculate MVA and to test the correlation with EVA as well as four other accounting measures, namely net income (amount), EPS, ROE and ROA. The results of their regression analysis are set out in Table 3.2.

Table 3.2: Correlation of different performance measures with shareholder wealth

Performance measure	r^2
EVA	40%
ROA	13%
ROE	10%
Net income (amount)	8%
EPS	6%

Source: Uyemura *et al*. (1996:98)

The analysis above clearly shows that EVA is the measure that correlates the best by far with shareholder wealth creation. In an alternative approach where changes in the performance measures were regressed against standardized MVA, the results were not very different. Standardized EVA (EVA divided by capital) again had an r^2 of 40%, while for ROA it was 25%, for ROE 21%, for net income 3% and for EPS 6%.

3.3.7 Grant's analysis of relative EVA and relative capital invested

Grant (1996:44; 1997:39) studied the relationship between MVA divided by capital and EVA divided by capital for 983 companies selected from the Stern Stewart Performance 1000 for 1993 and 1994. The results for 1993 showed an overall r^2 of 32% for all the companies. For the 50 largest USA wealth creators, the r^2 was 83%. For the 50 biggest USA wealth destroyers, it was only 3%.

When the same tests were repeated for 1994 it showed that the r^2 was 74% for the 50 largest wealth creators and 8% for the 50 largest wealth destroyers. This is in line with the findings of other researchers. These findings revealed a high level of correlation between MVA and EVA for companies with a positive EVA, but low levels of correlation for companies with a negative EVA.

Grant (1996) found that the real corporate profits should be measured relative to the amount of capital needed to generate that level of profitability. This insight led him to use standardized values for EVA and market value, instead of absolute values. He concluded that his empirical results indicate that EVA has a significant impact on a company's MVA. The value of a company responds to variations in both the near-term EVA outlook and movements in the long-term EVA growth rate.

3.3.8 Dodd and Chen's investigation of the explanatory power of EVA

Dodd and Chen (1996:27) used the 1992 Stern Stewart 1000 database as a starting point and added some supplementary data for the ten years from 1983 to 1992. They gathered complete data for 566 USA companies and set out to test the claim that EVA is a superior measure of shareholder value performance.

Although they did find a correlation between share returns and EVA (an r^2 of 20%), it was not as high as the r^2 of share returns and ROA, for which the r^2 was 25%. The r^2 for the other accounting measures tested, namely EPS and ROE, were very low (between 5% and 7%).

Based on the data of this large number of companies over as long a period as 10 years, it appears that EVA does not relate well to share returns. The results obtained imply that 80% of changes in share returns could not be accounted for by changes in EVA. In this specific study, and bearing in mind that unadjusted data were used, the ROA showed a better explanatory ability than EVA did.

Dodd and Chen (1996:27) also found that residual income, which is similar to EVA, except for the adjustments required to deal with the so-called accrual accounting distortions, gave results almost identical to those achieved using EVA. The r^2 of residual income relative to share returns was 19%, compared to EVA's r^2 of 20%.

Even when more complete multiple regression models were used, the results for the two measures were almost the same. The r^2 for EVA-based measures was 41%, compared to a similar r^2 of 41% for residual income based measures. Dodd and Chen concluded that EVA and residual income performance measurement systems would, in general, yield similar results.

3.3.9 Milunovich and Tsuei's study on the use of EVA and MVA in the USA computer industry

Milunovich and Tsuei (1996:111) investigated the correlation between frequently used financial measures (including EVA) and the MVA of companies in the USA computer technology industry (so-called "server-vendors") for the period from 1990 to 1995. The results of the study are set out in Table 3.3.

Table 3.3: Correlation of different performance measures with MVA in the USA computer technology industry

Performance measure	r^2
EVA	42%
EPS growth	34%
ROE	29%
Free cash growth	25%
FCF	18%

Source: Milunovich and Tsuei (1996:111)

Cleary EVA demonstrated the best correlation and it would be fair to infer that a company that can consistently improve its EVA should be able to boost its MVA and therefore shareholder value.

Milunovich and Tsuei (1996:111) argue that the relatively weak correlation between MVA and FCF is due to the fact that FCF can be a misleading indicator.

They point out that a fast-growing technology startup company with positive EVA investment opportunities and a loss-making company on the verge of bankruptcy can have similar negative cash flows. They concluded that growth in earnings is not enough to create value, unless returns are above the cost of capital. They are of the opinion that EVA works best as a supplement to other measures when one is evaluating shares and that EVA sometimes works when other measures fail.

3.3.10 Makelainen's evidence in support of EVA and related measures

Makelainen (1998:15) studied the evidence of the correlation between EVA and share prices and reviewed the work of Stewart (1991:215) and several other researchers up to 1997. However, she concentrated primarily on the study done on Finnish data by Telaranta (in Makelainen, 1998:15). Teleranta (in Makelainen, 1998:15) used 42 Finnish industrial companies, of which 26 were listed for the full period between 1988 and 1995, to test the ability of different measures to explain market movements.

Teleranta (in Makelainen, 1998:15) used MVA, market-to-book ratio and excess return on shares as dependent variables. As independent variables he used two versions of economic profit (residual income) and three versions of the Eduard-Bell-Ohlson figure (close to residual income) as well as traditional accounting based performance measures such as earnings before interest, taxation, depreciation and amortization (EBITDA), operating profit, NOPAT, net earnings and cash flow.

The results of Teleranta's (in Makelainen, 1998:15) study showed that the level of economic profit (as expressed by the r^2) explained 31% of the level of MVA. Of all the measures used by Teleranta (in Makelainen, 1998:15), economic profit was the measure closest to EVA. The next best measure was NOPAT, which explained 30% of MVA. When the changes in the measures were considered, the change in economic profit was still correlated best with changes in MVA with an r^2 of 17%. NOPAT was second best again, with an r^2 of just below 17%.

Teleranta (in Makelainen, 1998:15) concluded that economic profit was the best variable to use to explain market movements, but that there was little difference compared to other measures. Although the explanatory power revealed by his results is lower than that shown in the results of other earlier research by other researchers, the general result was more or less in line with their findings. It must also be borne in mind that Teleranta (in Makelainen, 1998:15) used data for a period that included a recession, and therefore the data included a considerable bias against EVA. Makelainen (1998:15) mentions that many Finnish corporate managers took the results of Teleranta's (in Makelainen, 1998:15) study very seriously.

3.3.11 Hall's study of the relationship between MVA and EVA for South African companies

Hall (1998:198) investigated the relationship between MVA and EVA, as well as other financial ratios such as ROA, ROE and EPS in South Africa. The study was done on the top 200 companies listed on the JSE for the period from 1987 to 1996. The sample included only industrial sector companies (financial, investment and mining sector companies were excluded). Companies with thinly traded shares were also not included in the sample, as this would have affected the reliability of the estimated WACC calculations.

Hall's (1998:198) study found relatively low correlation coefficients on the whole. The highest correlation was that between MVA and discounted EVA, with inflation adjustments to the data. He ascribes the low correlation to the fact that no distinction was being made between companies that create wealth and those that destroy wealth. He cites Grant (1997:44), who had done a similar regression exercise and found a more significant correlation after splitting his sample between the top 50 wealth creators and the worst 50 wealth destroyers.

Based on his findings that EVA shows the best correlation with MVA, Hall (1998:198) also analysed the value drivers of EVA and proceeded to do stepwise regression between EVA and a number of independent variables. The value drivers (building blocks of EVA) contributing most to the value of EVA were found to be profit ratios such as return on capital employed (ROCE), NOPAT divided by sales, and earnings before interest and tax divided by sales. The investment rate (change in the capital employed divided into the NOPAT), WACC and the company tax rate were all found to have a meaningful impact on EVA. Interestingly, the impact of balance sheet ratios was found to be insignificant.

Hall (1998:205) recommends that companies develop a "value-based management framework" through which management can improve shareholders' wealth most efficiently. Based on the findings of his study, he asserts that profitability ratios play the biggest role in determining the value of EVA and therefore suggests that all possibilities for improving these profitability ratios should be exploited first, as a matter of priority, before other remedial actions are embarked upon.

3.3.12 Kleiman's findings supporting better performance where EVA is adopted

Kleiman (1999:80) argues that research on EVA and other accounting performance measures up to 1999 could not conclusively prove whether EVA or EPS affected market returns most. He judged both EVA and EPS to be more or less equally effective in explaining share returns.

The study of Kleiman (1999:80) set out to determine whether companies that adopt EVA as a performance measure add more value for their shareholders than their industry competitors do. He limited his study to companies that had implemented EVA. His sample was 71 companies that had adopted EVA during the period from 1987 to 1996. For the sake of comparison he also identified the "closest-matched industry firm", namely the firm that was the closest in sales to the EVA company in the year prior to the adoption of EVA.

The results of the study showed that EVA companies earned an extra total return of 28,8% over four years versus the median industry competitor. In total, EVA companies created USA $124 billion more in share market value than their median competitors. This evidence was found to be robust (at a 99% confidence level) across the entire sample.

Companies that had adopted EVA showed greater improvement in operating profit margins. These improvements were attributable more to a decrease in assets, for example, sales of property, plant and equipment) rather than extensive cost cutting. In summary, the improvement in the financial ratios of EVA companies was consistent with improvements in EVA and superior share market performance.

3.3.13 Gates's study on strategic performance measurement systems

Gates (2000:44) performed a study on companies that had adopted strategic performance measurement (SPM) systems in order to evaluate management's success in improving operating efficiency and adding value for shareholders. The survey focused on the SPM practices of publicly traded industrial and service companies based (mainly) in the USA and Europe. Of the 113 companies that responded, more than a half said they had formal SPM systems and more than two thirds said they expected to have such systems in place within three years.

Gates (2000) wanted to find out what the most popular measures in these SPM systems were. For instance, were those measures mainly financial or were they non-financial or a mix of both? Regarding the emphasis of the SPM system, companies were almost evenly divided: 41% said they used a value-based approach and 40% said they used a balanced scorecard approach. There was also no significant difference between the share price performance of companies with "value-based" SPMs and those with balanced scorecard-type systems.

The balanced scorecard approach introduced by Kaplan and Norton (1996:9) suggests that companies should not only look at financial performance, but also that they should have a balanced approach consisting of the following critical performance areas:

- financial (how should we appear to our shareholders?);
- customer (how should we appear to our customers?);
- internal business process (to satisfy our shareholders and customers, what business processes must we excel at?); and
- learning and growth (to achieve our vision, how will we sustain our ability to change and improve?).

It was significant that, according to the response to the survey, most, if not all, companies wanted to adopt SPM systems that are strongly correlated with their shareholders' return on their investment. The most frequently mentioned SPM's that respondents expected to use during the following three years were cash flow, ROCE, economic profit and total shareholder return.

The percentage of respondents who wanted to adopt operating margin for the next three years dropped from 35% to 21%, while that of those who mentioned earnings fell from 23% to 16%. This bears out the increasing preference for EVA and EVA surrogate measures such as economic profit and ROCE.

3.3.14 Milano: EVA in the "new economy"

Milano (2000:119) investigated the use of EVA in the so-called "new economy", which is characterized by the expansion of the Internet and the advance of telecommunications technologies. These in turn provide new channels for media distribution and communication. With the ever-increasing emphasis on information, the rules of business are constantly changing. New market entrants break into existing markets at a much more rapid rate than before and talented human capital is flowing into businesses.

EVA has increasingly come under fire from critics who claim that EVA is not suited to a new knowledge-based environment where companies operate without buildings and machinery, with very little working capital (sometimes with a negative balance) and very little or no current profits. However, Milano (2000:119) argues that EVA is indeed suitable for new emerging companies, even more so than was the case with their older predecessors. He points out that although the nature of the companies is changing, the principles of economic valuation remain the same.

In valuing a new economy company such as Yahoo (worth US $100 billion in 2000; about twice the value of McDonalds), EVA presents a much simpler approach than the FCF method. The difficulty in applying the FCF method lies mainly in determining the terminal value of the company being valued at the end of the “planning horizon”, which could be, for example, 15 years. This is very hard to do for a new economy company such as Yahoo.

Milano (2000:119) argues that the EVA approach to valuation is much more straight-forward than the FCF method because it shows a greater percentage of the value occurring in the earlier years, when forecasting can be done with greater accuracy. His studies showed that in a typical FCF analysis of a new economy company, 80% to 99% of the value is determined by the terminal value. When the EVA approach is applied to the same company and time horizon, only 20% to 50% of the value was in the terminal value.

Milano (2000:119) highlights the importance of the FGV in the determination of the value of new economy companies and points out that it is mainly driven by four factors:

- EVA margins (EVA as a percentage of sales, for example, 59% for Yahoo and 44% for Microsoft in 2000);
- high growth rates (in EVA);
- low current market shares; and
- the ability to differentiate.

Milano (2000:119) concludes that the future of EVA appears to be promising as the new economy unfolds. He claims that EVA would be the tool used by successful companies moving towards decentralized decision-making, rapid innovation and the sense of ownership.

3.3.15 Kramer and Peters: EVA as a proxy for MVA

Kramer and Peters (2001:41) tested the ability of EVA to serve as a proxy for MVA across 53 industries in the USA. They wanted to discover whether the criticism that EVA was not suited to a new economy company with a small asset base was justified. Data obtained (purchased) from Stern Stewart & Co. for the period from1978 to 1996 was used and the 1000 large non-financial companies were divided into 56 industries. Three industries were left out because of outlier values.

The results of the study showed that for only 11 industries the correlation of EVA and MVA was better than for NOPAT and MVA, when the coefficient for EVA (in the linear regression function) was positive at the same time. This means that no marginal benefit accrues from using EVA as a proxy for MVA, instead of NOPAT, which is readily available.

Regarding the question about the suitability of EVA for new economy companies, the measure "fixed asset turnover" (FAT) was used as a determinant of the kind of company involved. A low FAT ratio would indicate a more industrial type of business with more tangible assets, while a high FAT ratio would indicate a more knowledge-based business. The study showed that there was no support for the contention that EVA is less likely to capture the performance of knowledge-based organizations.

3.3.16 Hatfield: How EVA affects R&D

Hatfield (2002:41) argues that EVA changes the accounting landscape fundamentally by treating R&D as a strategic capital cost rather than as an expense. As indicated in Section 2.4.3, R&D expenses are normally written off in the period when they are incurred, in accordance with the conservative accounting convention, GAAP. However, in determining EVA, R&D is capitalised and written off over the period during which there are expected to be benefits from successful research efforts. This change in the treatment of R&D has reinforced its role as an investment. The capitalisation of R&D is seen a visible sign that a company views R&D as a bridge to the future, not as a cost centre that needs to be limited or reigned in.

The focus on EVA encourages scientists and engineers to concentrate their efforts and ideas on projects that have a well-defined EVA-based payoff and can create value for the organisation. For a scientist, an EVA approach emphasises the importance of the cost of capital in R&D efforts such as product and process development.

EVA not only affects the way in which R&D is budgeted, it also provides a framework for technology valuation, affects R&D portfolio management and influences the generation of technical ideas. To summarize, Hatfield (2002:47) states that the real value of EVA to R&D lies in the fact that one system, EVA, can be utilized to manage a diverse set of issues confronting technology management, from financial metrics to portfolio decisions and people issues.

3.4 CRITICISMS OF EVA AND MVA

3.4.1 Kaplan and Norton's preference for the balanced scorecard

Kaplan and Norton (1996:47) developed the "balanced scorecard" approach to performance measurement in order to encourage business units to link their financial objectives to corporate strategy. This approach emphasizes the importance of performance at different levels, which includes financial performance, but does not focus exclusively on the financial results.

The vital areas of performance suggested by Kaplan and Norton (1996) are financial, customer, internal business process and learning and growth performance. They do acknowledge the fact that using EVA is a uniform, consistent and feasible approach that treats all managers fairly because the same measure is used for all of them. Their criticism of EVA and other financial measures is that these measures fail to recognize that different business units may have quite different strategies. Therefore it is highly unlikely that one financial measure, such as EVA, will be appropriate for all the business units in a company.

3.4.2 De Villiers's view of the effects of inflation on EVA

De Villiers (1997:285) studied the effects of inflation on EVA while using different weights for three classes of assets, namely non-depreciable assets, depreciable assets and current assets. He contends that it is one of EVA's disadvantages that EVA is based on accounting profit. Because accounting profit is a poor proxy for economic profit, this discrepancy is magnified by inflation, resulting in inaccurate EVA calculations.

Working on the premise that a company consists of a number of projects, its "true EVA" can be determined by subtracting the WACC from the internal rate of return (IRR). The IRR of a project represents its true economic return. Using a theoretical company consisting of different projects, each with the same IRR, De Villiers has demonstrated that the calculated EVA differed from the "true EVA" to varying degrees, depending on the rate of inflation and the mix of assets used.

Given that the EVA measure is widely used for strategic decisions such as resource allocation and manager performance measurement and remuneration, De Villiers (1997:285) cautions managers about the use of EVA in times of inflation. He suggests the use of a variation of EVA, AEVA (Adjusted EVA), but acknowledges that more research on the topic is needed in order to "operationalise" the concept.

3.4.3 Kramer and Pushner's findings against EVA

Kramer and Pushner (1997:41) studied the strength of the relationship between EVA and MVA, using the Stern Stewart 1000 companies for the period between 1982 and 1992. They found that although MVA and NOPAT were positive on average, the average EVA over the period was negative. This illustrated the significant impact of the cost of capital and the high future growth expectations for EVA.

The regression between the levels of MVA and the levels of EVA yielded an r^2 of 10%, which was significant, but left a large part of the MVA unexplained. Kramer and Pushner (1997:41) then proceeded to run regressions of MVA for the same period and lagged levels of EVA and NOPAT. They found that in all cases, NOPAT explained more of the total variation in market value than EVA did.

When the regression above was expanded to incorporate changes in MVA and changes in EVA and NOPAT, it was found that changes in EVA were negatively related to changes in MVA, while the correlation between changes in MVA and changes in NOPAT was positive. These authors suggest that this means that the market is more likely to react favourably to profits than to EVA, at least in the short term. They found no clear evidence to support the general idea that EVA is the best internal measure of shareholder value creation. In fact, from their studies it seems as if the market is more focused on profits than on EVA. They also suggest that compensation schemes must rather be tied to profits than to EVA.

3.4.4 Makelainen's criticism regarding EVA and wrong periodization

Makelainen (1998:21) criticizes EVA (and ROI) on the basis of "wrong periodization" of the returns of a single investment. EVA underestimates the return in the beginning and overestimates the return at the end of the period. For this reason, growth companies with heavy initial investment and long payoff periods, such as high-tech, telecommunication and pharmaceutical companies, may initially have a negative EVA. This negative current EVA is expected to change over into positive EVA and add to shareholder wealth in the long run.

Makelainen (1998:21) also criticized EVA with regard to the fact that it is distorted by inflation and quotes the work of De Villiers (1997:285) to support her arguments. Makelainen (1998:21) concludes her criticism of EVA by stating that in most cases, the impact of wrong periodization and inflation is relatively small and that it can be overcome by making some adjustments.

3.4.5 Biddle *et al's* lack of support for EVA

Biddle *et al*. (1999:69) state that numerous claims have been made about EVA and MVA, most based on "anecdotal evidence" or "in-house studies". They endeavored to present "independent research" covering a sample of more than 600 companies for the period from 1984 to 1993.

Their findings showed that current period accounting earnings (also called net income, or NI) is significantly more highly associated with market-adjusted annual share returns (an r^2 of 13%) than are residual income (an r^2 of 7%) and EVA (an r^2 of 6%). The r^2 of cash flows from operations was an almost insignificant 3%. Their results do not support EVA as being superior to earnings in its association with share returns.

Biddle *et al*. (1999:69) actually reworked some previous research by O'Byrne (1996:119) (see Section 3.3.5) when they applied some adjustments in a consistent manner; they found a better correlation between net income and firm value (r^2 of 53%) than with the EVA regression (an r^2 of 50%). Again no support was found for the contention that EVA dominates earnings in terms of its relevance for value.

The median values of EVA and residual incomes calculated for the period from 1988 to 1997 was not very different from the above results. Biddle *et al*. (1999:69) conclude that the net effect of Stern Stewart Consulting Company's accounting adjustments is not significantly large on average.

3.4.6 Brealy and Myers: EVA's bias towards certain projects

Brealy and Myers (2000:329) state that one of the main problems with EVA is the fact that it does not measure present value. EVA depends on current (adjusted) earnings and therefore favours projects with quick paybacks relative to those that have paybacks over longer periods. This criticism of EVA is similar to that by Makelainen (1998:21), who termed this attribute of EVA "wrong periodization".

Companies in the pharmaceutical sector are typical examples of this problem. It normally takes 10 to 12 years from the time when a new drug is discovered to the time when it is finally approved and starts yielding its first revenue. The same criticism is valid for startup companies that have a big initial outlay in research and development. These companies may have a negative EVA in the startup years, even if the expected NPV of the future cash flows is positive.

Brealy and Myers (2000) also criticize EVA because it requires accurate measurement of economic income and investment, which in turn, require considerable changes to income statement and balance sheet amounts.

3.4.7 Keef and Roush's comments on the incompatibility of EVA and MVA

Keef and Roush (2002:20) call MVA a "hybrid statistic" on account of the fact that the two measures used to determine it, namely market value and equity book value (invested capital), do not share the same attributes. They assert that the book value of equity is an *expost* measure because it consists of investments made in the past. On the other hand, market value is an *exante* statistic because it is the present value of future cash flows. What matters most is not the amount invested, or the value created or destroyed in the past, but in fact the current wealth (market value) and how it will change in future.

Keef and Roush (2002:20) also point out that MVA does not accommodate size and therefore underrates smaller companies that add a lot of value relative to the amount invested in assets, for example, Dell Computer, which had a 1998 MVA of US $25,7 billion on an asset base of only US $0,5 billion. Based on this argument they suggest that a standardized MVA would be more appropriate.

Another criticism they level at MVA is that the MVA is actually different for each shareholder, depending on when the shares are acquired. Even Stern Stewart Consulting Company acknowledges that there is no such thing as an MVA applicable to all shareholders.

Keef and Roush (2002:20) advise CEOs not to use MVA, but rather to seek to maximize the risk-adjusted return, as “this is what interests shareholders and measures wealth creation in a competitive market” (Keef and Roush, 2002:21).

3.4.8 Ramezani *et al*.: EVA’s failure to account for growth opportunities

Ramezani *et al.* (2002:56) investigated the relationship between growth, corporate profitability and value creation. They acknowledge that modern “value-based approaches” such as EVA and MVA reduce ambiguity about the question of whether growth enhances shareholder returns. However, they believe that whether the value-based performance measures are truly in line with shareholder interests remains an open question.

Ramezani et al. (2002) argue that MVA was introduced to overcome some of the criticism of EVA. They mention, for instance, that EVA does not account for growth opportunities inherent in a company’s investment decisions. They criticize MVA on the grounds that it may be biased by over- or under-valuation of a company’s growth opportunities as reflected in its stock price.

3.4.9 Paulo: Questionable basis for the calculation of EVA

Paulo (2002a:52; 2002b:500) argues that EVA is based on the capital asset pricing model (CAPM), which relies on the efficient market hypothesis (EMH). In an efficient market, the real rate of return (RRR) theoretically equals the internal rate of return (IRR), resulting in an EVA of zero. Therefore EVA attempts to measure something that, by definition, cannot exist.

Paulo (2002a:53) states that arbitrage and competitive forces ensure that abnormal profits cannot occur consistently. On average, a positive EVA is offset by a negative EVA and the occurrence of EVA would be random and statistically non-significant. Within an EMH world, EVA is regarded as a fiction.

Even in a non-EMH world, the basis for the calculation of EVA is questionable, because it relies on the CAPM and beta to calculate the cost of equity. The historic volatility of security markets has proved to be much higher than what could be justified in terms of the CAPM. Using the CAPM and beta is therefore an undesirable way to calculate the cost of capital and is not a method that should be used for valuation purposes.

Paulo (2002a:54) argues that WACC was originally developed by the legal fraternity to ensure that all contributors of financial capital obtained a fair return. WACC is not concerned with the value of the firm or with maximizing shareholder value. He concludes that the validity of EVA should be questioned because it relies on an inappropriate input, namely WACC.

3.4.10 Ooi and Liow: Some limitations of EVA for property companies

Ooi and Liow (2002:29) found in a survey of property companies in Singapore that the EVA of property assets and businesses tends to be understated if the capital appreciation component is not taken into account. If they rely solely on EVA as a performance measure, companies may make the poor decision of divesting themselves of their property businesses.

A too narrow focus on the EVA of property companies (which may have a low or negative EVA) would result in a situation where top managers' compensation would be very low, if it is tied to EVA. Ooi and Liow (2002:29) argue that over-reliance on EVA could deter the long-term sustainable growth of a property company. They state that EVA is merely a measure of capital efficiency and that it reveals nothing about a company's relative capacity to create new wealth within its industry.

3.4.11 Copeland's preference for expectations-based management to EVA

Copeland (2002:48) did a survey on data from the S&P 500 companies from 1992 to 1998 and found little correlation between their short-term total return to shareholders and their short-term EPS, growth in earnings, EVA, and their percentage change in EVA. However, he found a highly significant correlation between the total return to shareholders and analysts' expectations of earnings. This expectations-based measure (expected earnings) showed an r^2 of 42% relative to the total shareholders' return.

Copeland (2002:51) argues that a business unit that earns more than its cost of capital (one that has a positive EVA), only creates value (in terms of market value) if it earns more than expected. So, for example, if a company has a WACC of 15% and it is expected to earn 30% but actually earns 25%, it under-performs in terms of the expectations and therefore destroys value. The reason for this is that the expectation of a 30% return has already been discounted into the current share price.

Copeland's (2002:53) concludes that EVA can still be used in setting up a budget that includes a capital charge for own capital, which in turn provides the incentive to manage both the income statement and the balance sheet. However, he cautions against overly optimistic or pessimistic claims based on EVA alone.

Furthermore, Copeland (2002:53) has found that attempts to establish objective measures of company or business unit performance are useless. In the application of expectations-based management, he suggests that the communications between company management and investors and analysts be done in an objective, unbiased way in order to facilitate value maximization and a long-term focus.

3.5 ADJUSTMENTS TO FINANCIAL STATEMENTS

In the calculation of EVA and MVA, it is a basic requirement that the investor's point of view is taken, rather than that of the accountant. This means that the full cost of IC should be taken into account in determining EVA and MVA. NOPAT needs to be adjusted accordingly in order to apply the investor's perspective consistently. Stern (1993:36) refers to these adjustments as "accounting anomalies".

The asset values and profits reflected by the accounting statements – drawn up according to GAAP – do not conform to the investor's point of view due to the (mostly conservative) accounting treatment of a number of accounting items. Some of these accounting items were discussed in Chapter 2 when the reasons for the vulnerability and weaknesses of accounting measures were given.

The adjustments required to the book values of assets in order to convert them to the amount of IC (taking the investor's point of view) stem from the fact that the accounting items mentioned in the previous paragraph do not reflect the investor's point of view. The same applies for the adjustments to NOPAT. The accounting figures have a conservative bias that causes both the IC and the profit to be understated.

According to Ehrbar (1998:164), about 160 adjustments can be made to the financial statements in order to calculate EVA, but for most companies just a few important ones (not more than ten), those that have the most significant impact, will suffice. In the following sections the necessary adjustments for each accounting item are discussed. The most important adjustments are:

- R&D costs;
- marketing costs (related to launch of new products);
- strategic investments;
- accounting for acquisitions (goodwill);
- depreciation;
- restructuring costs;
- taxation;
- marketable investments;
- off-balance sheet items;
- free financing; and
- intangible capital.

After the adjustments required have been explained, an example is given to illustrate typical adjustments applied to the financial statements of a company. In conclusion, the link between EVA and MVA, as well as the link between EVA, MVA and NPV is presented.

3.6 SPECIFIC ITEMS TO BE ADJUSTED

In this section the background to and reasoning behind the most important adjustments are discussed, as well as the way in which the financial statements are affected by these adjustments.

3.6.1 R&D costs

According to GAAP, research costs should be written off in full during the financial period when they are incurred. The same applies for development costs, which may only be deferred, or capitalized, if there is a strong expectation that they may lead to significant cash benefits in future. The result of this requirement is that the bulk of the total amount of R&D costs of any given company is written off immediately, which could create the erroneous impression that the investment is worthless.

This conservative outlook causes both invested capital and profits to be understated. For companies with a high proportion of R&D costs, for instance those in the pharmaceutical sector or high-tech companies, the understatement of assets and profits using GAAP could be substantial.

The EVA approach requires R&D expenditure to be capitalized in the balance sheet as an asset and amortised over an appropriate period. It is suggested that the capitalized amount should be written off over the payoff period for projects that prove to be financially viable (Stewart 1991:116).

Research quoted by Ehrbar (1998:168) has concluded that the appropriate period of amortisation could be as short as three to four years for scientific instrument companies, but up to eight years or more for pharmaceutical companies. He also states that Stern Stewart Consulting Company use five years – which is the average useful life of R&D expenditure for all industries – in making adjustments for the Performance 1000 companies. (As indicated in Section 3.3.1, the Performance 1000 companies are the top American companies rated according to MVA by Stern Stewart Consulting Company).

It is important to note that the impact of the adjustment tends to be greater for fast-growing companies that invest heavily in R&D. For such companies there is a substantial difference between the full R&D expense (incurred), written off while applying GAAP, compared to the amount amortised based on the capitalized R&D amount. The adjustment becomes insignificant when the company reaches a steady-state growth, in which case the R&D incurred and the amount amortised would be equal.

Another argument in favour of the R&D adjustment is that chief executive officers (CEOs) whose bonuses are based on earnings have a disincentive to invest in

R&D. On the other hand, if bonuses and pensions are based on EVA instead of earnings, there is little or no temptation to cut R&D expenditure, as this would have no immediate effect on EVA. As a matter of fact, Ehrbar (1998:169) states that the initial capitalization and subsequent amortisation of R&D expenditure in future years tends to make managers feel accountable for results and to ensure that researchers evaluate prospective projects objectively.

3.6.2 Marketing costs

In applying the same principle as with R&D expenditure, Stewart (1991:116) reasons that the new product development and up-front marketing costs incurred to capture an initial market share should also be capitalized and amortised over an appropriate period. He suggests that the lives of successful new products can be used as the amortisation period.

Security companies, for instance, install security systems “for free”, expecting the monthly fee paid by the home-owner on an ongoing basis to more than make up for the initial cost. Cellular phone companies also sell cellular phones at selling prices below cost, but in doing so, gain new customers using the same principle. GAAP requires these marketing costs to be written off as incurred, but from an investor’s point of view, they should be capitalized.

Other examples include the cost of designing and promoting luxury cars, such as the Infinity (Nissan) and the Lexus (Toyota). These costs should be capitalized and amortised, instead of being written off when incurred. Another example is the huge amount – “hundreds of millions of dollars” – (Stewart 1991:116) that Gillette spent to develop and market the new spring-suspended razor, the Sensor. Stewart (1991:116) asserts that the full amount which has been written off by Gillette should be seen as a form of capital investment. He is of the opinion that the fact that there was uncertainty about the future payoff of the projects was irrelevant on the grounds that “management’s strategy, if successful, anticipates and requires a payoff over an extended period of time” (Stewart 1991:116).

3.6.3 Strategic investments

Strategic investments are investments that normally yield no immediate increase in profits and EVA, but that are expected to have some payoffs only from a certain point in future. Typical examples are investments to establish new developing markets and investments in new technologies and capabilities to exploit the worldwide web and e-commerce opportunities.

There is some reluctance on the side of managers to go ahead with an investment, for example, the construction of a plant that may take a number of years to complete and thereafter will take another few years to begin operating at full capacity. The capital charges on an investment like this will reduce EVA dramatically in the years before the plant becomes profitable.

The problem with strategic investments is that if the immediate impact on profitability and EVA is ignored, there is no guarantee that discipline will be exercised in making the investment (while capital discipline is one of the hallmarks of EVA). Companies hardly ever determine whether the returns on strategic investments in later years live up to the initial expectations. For this reason the term "strategic" has become a byword for unsuccessful projects that never pay off.

The adjustment for strategic investments suggested to overcome the peculiarities of this item is firstly to "hold back" the investment in a "suspension account". If this is done, the capital charge on the investment (or balance in the suspension account) is not taken into account determining EVA until the time when the investment is expected to deliver operating profits.

In the interim, before the investment becomes profitable, the capital charges that would have been calculated on the investment (now in the suspension account), are simply added (or deferred) to the suspension account. The suspension account then reflects the full opportunity cost of the investment, including an "accrued interest".

As soon as the investment starts producing NOPAT, the capital in the suspension account is taken into account in the EVA calculation. This approach encourages managers to expand their long-term view and to explore investments with deferred payoffs. The managers are still accountable for the capital they invest, even though they are not penalized in the short term. It is suggested that companies formulate their guidelines for strategic investments beforehand and do not diverge from them.

3.6.4 Accounting for acquisitions (goodwill)

Goodwill usually refers to an intangible asset that may be bought (like a patent), or developed internally by a company, or it may originate from an acquisition transaction. Goodwill on acquisition is defined as the excess amount a company pays above the “fair value” of the assets of the acquired company. The amount of goodwill may typically be payable for technological knowledge, patents, R&D projects in progress or simply the good standing the company and its brands have established with customers.

The accounting treatment of goodwill is the following: in the USA the amount of goodwill is capitalized if the “purchase” method is used and than it is amortised over a maximum period of 40 years. The accounting treatment for South African companies is the same, but the maximum amortisation period is 20 years.

The problem with the amortisation of goodwill is that profits and ROA and ROE are initially understated because of the amount written off against profits annually. In subsequent years, the ROA and ROE are ultimately overstated when the capitalised goodwill in the balance sheet is written off completely.

Stewart (1991:114) suggests that the proper economic treatment of goodwill is to write it off over its estimated economic life. However, because goodwill consists mostly of assets with indefinite lives such as brands, reputation and market position, they recommend that it is kept on the balance sheet at the original amount and not written off at all.

From the investor's point of view, the full capital cost of the acquisition investment should be shown if the goodwill is capitalized and not amortised. The cash flow value of the investment is then reflected irrespective of the accounting treatment and managers are allowed to concentrate on earning returns above the cost of capital on the investment in the long run (indefinitely).

In the USA, another approach is allowed in dealing with goodwill, the "pooling-of-interest" method. When this approach is used, the balance sheets of the two companies are added together and goodwill is not accounted for at all. In this instance, it is also recommended that goodwill be capitalized and not written off, so that the full capital costs of the acquisition are recorded for the purposes of calculating EVA.

3.6.5 Depreciation

For most companies, the straight-line method of depreciation, applied according to GAAP, does not distort profits or the calculation of EVA. However, where a company has a significant proportion of older, long-lived equipment, the situation becomes more complicated. Under this scenario, using the straight-line method of depreciation can cause a strong bias against investment in new equipment.

Using the straight-line method of depreciation, the EVA capital charge becomes smaller and smaller as the book value of the assets decreases, causing the old assets to look much "cheaper" than new ones. Managers tend to be reluctant to replace old assets with new ones because of the higher cost attached to the new assets.

Using the sinking-fund depreciation method, instead of the straight-line method, can eliminate this distortion. When depreciation is calculated according to the sinking-fund method, the annual amounts of depreciation start small and then get progressively bigger, much like the capital portion of a mortgage payment.

The sum of the annual sinking-fund depreciation and the EVA capital charge will then remain constant from one year to the next, as with a mortgage payment. This change in the method of depreciation eliminates the bias against investment in new assets. It also more closely reflects the real-life situation where a plant and equipment with a long lifetime depreciate little in the first few years and then lose value at an accelerating pace.

3.6.6 Restructuring charges

Restructuring charges refer to the loss made on an investment that fails to live up to expectation. According to GAAP, the loss on the investment should be written off in the income statement, normally causing a large decrease in profits. It can be said that the GAAP treatment in restructuring charges focuses on past mistakes.

According to Ehrbar (1998:175), the investor's view is much more positive: "Viewed from the executive suite, a restructuring should be thought of as a redeployment of capital that is intended to improve profitability going forward by reducing ongoing losses from past mistakes." The appropriate treatment of restructuring charges can best be described by way of an example.

Company X has (among other assets) a factory of R100 million that yields no (zero) operating profits. The factory can be sold for only R40 million and this amount can then be paid out to shareholders as a dividend. The loss on the sale of the factory (R60 million) is written off to reduce earnings. If the cost of capital is 20%, the capital charge for the factory is R20 million (R100 million x 20%) and the EVA is minus R20 million (zero profit less the capital charge of R20 million).

From a manager's point of view, it does not make sense to sell the factory, as this would cause GAAP earnings to drop by R60 million, fixed assets to decrease by R100 million and a decrease in the scope of operations. If the factory is not sold, it is still breaking even profit-wise, so there is no incentive to sell.

From an EVA point of view, the treatment of the potential loss on the factory changes as follows: it is now called “restructuring charges” and is shown as an investment in the balance sheet at R60 million, instead of being written off. The capital decreases by the amount of the dividend to be paid out, R40 million, and not by the full R100 million. The EVA changes as follows: operating profits remain at zero, while the capital charge is 20% on R60 million (R12 million), giving a negative EVA of R12 million.

Selling the factory would cause the EVA to improve from R20 million negative to R12 million negative. Hence, a manager whose remuneration is linked to changes in EVA would be inclined to sell.

3.6.7 Taxation

Most companies determine profits in one way for financial reporting and then present a different taxable profit, on which the tax payable is based, to the Receiver of Revenue. The taxable profit is usually lower than the accounting profit, mainly because of timing differences, of which depreciation is a good example.

If a company uses accelerated wear and tear for income tax purposes (or qualifies for tax allowances on capital assets) while using straight-line depreciation for accounting profit purposes, the taxable profit is lower than the reported accounting profit. Timing differences like these give rise to deferred tax, which is reflected on the balance sheet. The result of this is that the actual tax paid in a given year is not the same as the tax charge or debit in the income statement (normally it is lower).

From an investor’s point of view, a growing, going-concern company will probably never actually pay deferred tax. When calculating NOPAT and EVA, only tax actually paid in cash must be taken into account. The adjustment required therefore entails determining the amount of all deferred tax deducted from earnings in the past and then adding it back to equity, so that the IC and the cost of capital can be calculated.

When managers are charged for tax actually paid, there is an incentive for them to do proper tax planning in collaboration with the tax department in the company before they take investment decisions. This ensures optimal tax management early on in the process, instead of involving the tax experts at a later stage when the decisions have already been made.

3.6.8 Marketable investments

Some companies may hold investments in cash, marketable securities, loans or shares. These passive investments should not be included as part of the invested capital because they do not contribute to the operating profit. It follows logically that the income from these investments should not be included in operating profits, but should be added to profits after the calculation of NOPAT.

3.6.9 Off-balance sheet items

Although GAAP limits off-balance sheet financing, for instance, by requiring the capitalization of financial leases, there are still some items that do not appear on the balance sheet, when in fact they should. These off-balance sheet items should be included in the amount of invested capital. Typical items such as uncapitalised (operational) leases and securitized debtors should be brought back into the balance sheet to reflect the full amount of IC for the purposes of determining EVA.

If managers consider only the interest rate on an uncapitalised lease, the lease will appear to be cheaper than it really is at the WACC. In this instance, managers should be careful not to confuse the financing decision with the investment decision.

3.6.10 Free financing

In determining the amount of IC, all free financing items, such as accrued expenses and non-interest-bearing accounts payable, should be subtracted from the total assets. The cost of capital is then applied to the net assets used in operations in order to calculate the capital charge and EVA.

3.6.11 Intangible capital

Recent developments in finance and the circumstances under which firms operate (so-called new economy) require a fresh approach from modern companies – an approach which is quite different from the traditional approach that helped companies to be successful in the past. Glassman (2000:119) puts it as follows: "In sum, new tools, new accounting, and a new mindset are necessary to promote the kinds of capital investments – in software, capabilities, customers, people, and brands – that create value in today's marketplace."

Heavy investment in IT infrastructure and real-time communications are common characteristics of leading American companies such as Dell Computer, Wal-Mart, Cisco and eBay. Although the investment in hardware (equipment) is capitalized, the greater part of such outlays consists of project development, training, documentation and maintenance, all of which are written off in the income statement.

However, managers are often discouraged from making such value-creating investments because their compensation is still linked to traditional accounting measures such as earnings. As with the treatment of goodwill (as discussed in Section 2.4.2), it is recommended that intangible investments in IT infrastructure, capabilities and training be capitalized in the balance sheet. This ensures that managers are not penalized in the short term and that they remain accountable for returns in the long term.

Only adjustments that have a significant impact on EVA and MVA need to be made. The adjustments most likely to be made (as is shown by the practical experience of EVA consultants) have been discussed above, along with their impact on financial statements.

3.7 EXAMPLE OF EVA ADJUSTMENTS

Below, a hypothetical company is used to illustrate how some of the most important adjustments to the financial statements are made in order to determine EVA.

Assume Company Z started doing business at the beginning of 2001 and presented the following financial statements at the end of 2002:

Balance sheet for the year ended 31 December 2002

	R million	R million	R million
Non-current assets			
Plant and equipment		160	
Motor vehicles		72	
Marketable investment		20	
Goodwill		48	300
Current assets			
Inventory		100	
Debtors		90	
Cash		5	
		195	
Current liabilities			
Trade creditors	83		
Tax payable	12	95	100
			400

Equity and liabilities

Share capital	200
Reserves	66
Deferred tax	14
Long-term loan (15% interest p.a.)	120
	400

Income statement for the year ended 31 December 2002

	R million	R million
Sales		480
Cost of sales		240
Gross profit		240
Other expenses:		
Amortisation of goodwill	6	
Depreciation on plant and vehicles	32	
Marketing costs	60	
Provision for doubtful debts	15	
Salaries and wages	53	166
Operating profit		74
Income from investments		2
		76
Interest on loan	18	
Restructuring costs	4	22
Profit before tax		54
Taxation *(Calculation 1)		18
Profit after tax		36

***Calculation 1**

Profit before tax	54
Add amortisation of goodwill	6
Taxable income before timing differences	60
Tax allowances minus depreciation on plant and vehicles	20
Taxable income after timing differences	40
Taxation – current year 30% x R40 million	12
– deferred tax 30% x R20 million	6
Tax charge in income statement	18

Further information

1. The restructuring costs originated from a loss on an investment that went bad. However, the benefits of restructuring the business are expected to continue indefinitely.
2. An initial amount of R60 million was brought into the books for goodwill when another company was taken over just after Company Z started doing business two years ago. The goodwill is to be written off over a period of ten years.
3. A provision for doubtful debts was created for the first time during 2002. The amount provided of R15 million is considered to be too high by R10 million.
4. The total amount for marketing costs was incurred to launch a new product and the benefits of the marketing effort are expected to last for four years, which include the current year (2002).
5. The company tax rate is 30% and it is assumed that the amortisation of goodwill is not tax deductible.
6. The WACC is 20%.

Based on the information given, the required adjustments to NOPAT to determine EVA are the following:

Adjustments to NOPAT

	R million	R million
Operating profit before tax		70
Less tax		18
NOPAT		52
EVA adjustments:		
Add deferred tax provision	6	
Add goodwill amortised	6	
Add marketing costs capitalised (60 x 3/4)	45	
Add excess provision	10	67
Adjusted NOPAT		119

Adjustments to net assets

	R million	R million
Net assets per balance sheet		400
Adjustments:		
Add restructuring costs now capitalised	4	
Add goodwill written off (6 x 2)	12	
Add excess provision for doubtful debts	10	
Add marketing costs now capitalized	45	
Less marketable investment	(20)	51
Adjusted invested capital		451

Calculation of EVA

EVA for 2002 = Adjusted NOPAT – (WACC x Adjusted IC)
= 119 – (20% x 451)
= R29 million (rounded to nearest R million)

The result of R29 million indicates that the company was able to generate a positive economic profit after taking into account all the cost of capital. It is expected that the market will react favourably to this result and internal measure of value creation if it is higher than the original expectations of shareholders. The impact that current EVA may have on the MVA of a company is discussed in Section 5.4 below when the link between EVA and MVA is investigated.

3.8 LINK BETWEEN EVA AND MVA

In this section, the relationship between EVA and MVA is expressed using different assumptions about the expected future growth of EVA. MVA is defined as the present value (PV) of all future EVA. Therefore it can be expressed as follows:

MVA = PV (All future EVA)

The link between EVA and MVA is determined by expectations about the future growth in EVA. It may be that the current EVA of a company does not reflect future expectations and MVA very well. A newly established company with high growth expectations may have a negative current EVA and a large positive MVA at the same time.

Other companies may have positive current profits and a positive EVA, combined with poor future prospects and expectations, and therefore have a low or negative MVA. For companies with a positive current EVA, which is reflected in a positive MVA, the relationship between EVA and MVA can be described for the following three scenarios:

- no future growth in EVA;
- constant future growth rate in EVA; and
- abnormal growth initially, then constant growth in EVA.

Each of these scenarios is discussed in turn below and it is illustrated by means of examples of what effect the different growth assumptions have on shareholder wealth, as reflected by the MVA.

3.8.1 No future growth in EVA

When no future growth in EVA is expected, the current EVA is perpetuated indefinitely. Therefore the MVA (the PV of all future EVA) is a perpetuity and is calculated as follows:

MVA = Current EVA / WACC

Using the information of the example set out in Section 3.7, the MVA calculation for 2002 is R145 million.

It must be borne in mind that the EVA is a total amount that indicates the performance of the company for a given year, while MVA is an incremental measure at the end of a given period, indicating the cumulative value added from the inception of the company up to the present time.

3.8.2 Constant future growth rate in EVA

Where the future EVA is expected to grow at a constant rate, it would be appropriate to measure MVA using a formula similar to the well-known Gordon (constant) growth model. The Gordon model uses dividends as well as the expected future growth rate and the cost of equity to determine the value of ordinary shares.

Value of share = $D_o (1 + g) / (k_e – g)$

where

D_o = Current dividend per share

g = Expected future growth rate

k_e = Component cost of equity

Using an adjusted version of this formula, the MVA can be determined as follows:

$$MVA = \text{Current EVA } (1 + g) / (WACC - g)$$

where

$$g = \text{Constant expected future growth rate in EVA}$$

Applying this formula to the information in Section 3.7 and adding an assumed constant future growth rate in EVA of 10%, the MVA for 2002 is R319 million.

3.8.3 Abnormal growth initially followed by constant growth

Where it is expected that future growth in EVA will be abnormally high in the first few years and then level off to a constant rate, an adjusted version of the Gordon constant growth model formula can be used to determine MVA. The formula is merely adjusted to accommodate the abnormal growth in the first few years and then adds the present value of EVA with constant growth. Assuming that the abnormal growth in EVA will be 20% per year in each of the first three years and that thereafter the growth rate will level off to a constant 10% per year, the formula is the following:

$$MVA = PV\,(EVA_1) + PV\,(EVA_2) + PV\,(EVA_3) + PV\,[EVA_3 \times (1 + g) / (WACC - g)]$$

Again using the information in Section 3.7, the MVA for 2002 is R406 million.

As stated before, the current EVAs of new, fast-growing companies may not be a good basis on which to project their future EVAs and the value of their MVA. The reason for this is that the bulk of the value of these companies is contained in their FGV.

Stern *et al*. (2001:214) gave the following alternative definition of value:

Value = Capital + PV (EVA)

= Capital + EVA / c + PV (Expected improvement in EVA)

where

c = Cost of capital

The second line of the formula above can be rewritten as follows:

(Value – Capital) = EVA / c + PV (Expected improvement in EVA)

Thus, MVA = EVA / c + FGV

If this formula is applied to the information in Section 3.7 and the scenario in Section 3.8.2 and where there is constant expected future growth in EVA, MVA can also be calculated as follows:

MVA_{2002} = R29 million / 0,2 + FGV

= R145 million + PV (EVA growth above R29 million p.a. in perpetuity)

At this point, it may be helpful to analyse the FGV. For this specific example, it can be calculated as follows:

FGV = (R2,9 million p.a. with no growth in perpetuity, plus the discounted value of R2,9 million in the first year and constant growth of 10% for each year in perpetuity)

= R29 million / 0,2 + [R2,9 million (1 + 0,1) / (0,2 – 0,1)] / 0,2

= R14,5 million + R31,9 million / 0,2

= R174 million

And MVA_{2002} = R145 million + R174 million

= R319 million

This is the same as the result in Section 3.8.2.

3.9 LINK BETWEEN EVA, MVA AND NPV

A question of vital importance is whether the use of the NPV approach in the evaluation of capital investment projects does indeed lead to a maximization of shareholder value and therefore of MVA.

The answer to this question only becomes clear when a comparison of the results of MVA and NPV is done for a specific company.

For example, Company M is considering the acquisition of an item of equipment for R12 million. The expected useful lifetime of the equipment is three years and there will be no residual value at the end of the period. The annual depreciation will be R4 million on a straight-line basis and the book value of the equipment is therefore R8 million at the beginning of the second year and R4 million at the beginning of the third year.

The equipment is expected to yield additional sales of R12 million in the first year, R16 million in the second and R20 million in the third year. The working capital required to support the sales will be 10% of the sales amount and it must be available at the beginning of the year. Increases in sales will cause increases in the working capital required and the total amount of working capital will be a cash inflow at the end of the third year.

The working capital required at the beginning of the first year is R1,2 million (10% of the R12 million), while the increase required at the beginning of the second year will be R0,4 million [10% of (R16 million – R12 million)]. The increase in working capital will be R0,4 million [10% of (R20 million – R16 million)] at the beginning of the third year, with an inflow of R2 million at the end of the third year.

It is assumed that the operating expenses, other than the depreciation, amount to 50% of sales; the tax rate is 40% and the WACC is 20%. The NOPAT is R1,2 million in the first year, R2,4 million in the second year and R3,6 million in the third year.

PERIOD	**0**	**1**	**2**	**3**
Amounts in R millions				
INVESTMENT CASH FLOWS				
Initial outlay for equipment	(12,0)			
Working capital required	(1,2)	(0,4)	(0,4)	
Inflow of working capital				2,0
Investment cash flows (A)	(13,2)	(0,4)	(0,4)	2,0
CALCULATION OF NOPAT AND CASH FROM OPERATIONS				
Sales		12,0	16,0	20,0
Less operating expenses (50%)		(6,0)	(8,0)	(10,0)
Less depreciation		(4,0)	(4,0)	(4,0)
Profit before tax		2,0	4,0	6,0
Tax (40%)		(0,8)	(1,6)	(2,4)
NOPAT		1,2	2,4	3,6
Add depreciation		4,0	4,0	4,0
Cash flow from operations (B)		5,2	6,4	7,6

CASH FLOWS FROM INVESTMENT & OPERATIONS (A + B)	(13,2)	4,8	6,0	9,6

NPV = R522 222

The IRR is 22,23%, which exceeds the WACC of 20% and leads to a positive NPV. The same information as given in the example is now used below to calculate EVA and MVA and to show that, theoretically, NPV and MVA yield the same results.

PERIOD	**1**	**2**	**3**
Amounts in R millions			
CALCULATION OF EVA AND MVA			
NOPAT	1,20	2,40	3,60
Invested capital			
– Equipment book value beginning	12,00	8,00	4,00
– Working capital beginning	1,20	1,60	2,00
	13,20	9,60	6,00
Capital charge @ 20%	2,64	1,92	1,20
EVA (NOPAT – capital charge)	(1,44)	0,48	2,40

The MVA using a discount rate of 20% is R522 222.

The obvious conclusion from the example above is that the MVA (the PV of all future EVAs) is exactly the same as the NPV (the PV of all future cash flows).

A comparison of the cash flows using the NPVs and the EVAs in the determination of MVA shows that the EVA at the end of the first year is negative, while the cash flow is positive. There is therefore no value creation in the first year, although the investment does create a positive cash flow.

The difference between the annual cash flows using the NPV method and the annual EVAs stems from the treatment of the IC. With the NPV approach, the IC is taken as an outflow (in full) at the beginning of the first year. With the EVA/MVA approach, the cost of the initial investment is taken into account in two separate components, namely in the depreciation charge of R4 million per year and in the capital charge of R2,4 million (R12 million x 20%) for the first year, R1,6 million (R8 million x 20%) for the second year and R0,8 million (R4 million x 20%) for the third year.

The calculation below illustrates why NPV and MVA give the same results, by proving that the PV of the annual depreciation plus the capital charge (used in the EVA and MVA calculation) is equal to the initial cost of the new investment (used in the NPV calculation).

PERIOD	**1**	**2**	**3**
Amounts in R millions			
Depreciation	4,0	4,0	4,0
Capital charge	2,4	1,6	0,8
Total	6,4	5,6	4,8

The PV of the sum of the depreciation and the capital charge is equal to R12 million, which in turn, is equal to the original investment.

Drury (2000:806) confirms that NPV and MVA yield exactly the same results and states that if maximizing NPV is equivalent to maximizing shareholder value, then Stern Stewart Consulting Company's claim that the maximization of EVA also leads to the maximization of shareholder value, is justified.

The main advantage of the NPV approach is that it allows managers to take into account the cash flow impact of non-financial issues such as health and safety, as well as operations' impact on (and restoration costs of) the environment.

Managers can ignore the amount of IC at the beginning of the period and concentrate on the cash flows from the project.

The biggest advantages of MVA and EVA in comparison to NPV are that they can be determined for a project on its own or for an organization as a whole and that they are based on the principle of economic profits, as represented by EVA. Furthermore, EVA and MVA are much more suitable than the NPV approach for performance measurement and compensation because they provide an incentive for managers to act as if they were the owners of a business.

3.10 CONCLUSION

The concepts of EVA and MVA have been widely embraced by academics, investors and business managers alike. EVA and MVA represent new benchmarks that enable financial managers to align and deploy their efforts in such a way that shareholder value is maximized. These concepts have been popularized and marketed effectively by Stern Stewart & Co. and have been implemented by high-profile companies world-wide, including Coca Cola Company, Siemens, AT & T, DuPont, Eli Lilly and Quaker Oats.

Wood (2000:9) found that, by 2000, more than 400 South African organizations had already implemented EVA and “that it seems likely that it will gain increasing prominence in South Africa in the years ahead.” In further support of EVA, Fatemi *et al*. (2003:175) found that EVA and MVA were better predictors of top management pay than other performance measures. Abdeen and Haight (2002:35) emphasized the use of average EVA over three to five years as a target, rather than the EVA of one year, because of business cycles and seasonal fluctuations.

Although EVA and MVA cannot be regarded as the final answer to the challenge posed by the quest to evaluate and manage company performance objectively, it is acknowledged that no better alternative measures exist at the moment. Proponents of EVA advocate its superiority to other financial performance measures and point out the following outstanding features (Ehrbar and Stewart, 1999:20):

- EVA is the performance measure that is tied most directly (theoretically and empirically) to the creation of shareholder wealth;

- EVA is the only measure that always gives the “right” answer, in that more EVA is always better for shareholders (this is not always the case with profits and earnings);

- EVA provides a framework for a comprehensive new system of corporate financial management, encompassing operational budgets, capital budgets, strategic planning and acquisitions and divestitures;

- EVA is a simple but effective method for teaching business literacy to less sophisticated workers;

- EVA is the key variable in a unique incentive compensation system that causes managers to think like owners;

- EVA provides a framework that companies can use to communicate their goals and achievements to investors; and

- EVA is part of an internal system of corporate governance that motivates all managers and employees to work cooperatively and enthusiastically to achieve the very best performance possible.

Several studies, most of which has been conducted by Stern Stewart Consulting Company, support the view that EVA is superior to other earnings-based measures in explaining changes in MVA. By contrast, other researchers have questioned the validity of Stern Stewart Consulting Company’s initial claims. Some have even provided evidence that earnings, and specifically NOPAT, are superior to EVA in explaining changes in MVA (Kramer and Pushner, 1997:41; Biddle *et al*., 1999:69).

Some authors, such as De Villiers (1997:285), Makelainen (1998:21) and Brealy and Myers (2000:329) have criticized EVA directly, mostly on the grounds of wrong periodization and being inaccurate under conditions of inflation. The initial "hype" about EVA and MVA has died down somewhat. As more research evidence regarding EVA becomes available, the alleged advantages of EVA appear to be less clear-cut than was initially reported. The balanced current view is that the evidence supporting EVA is not conclusive and that more research is required to clarify this issue.

It can, however, not be denied that EVA does take into account the full cost of capital of all sources of finance used by the company and therefore makes economic sense. EVA is based on accounting earnings and the adjustments required cause some ambiguity. The ambiguity is caused by the fact that a large number of possible adjustments can be made to the financial statements in order to determine reliable values for EVA and MVA.

There is subjectivity involved in the process of making these adjustments because different analysts could make different adjustments to the same financial statements and also do specific adjustments differently. However, to date, EVA is still the best internal performance measure available to management to enhance shareholder value.

The financial statements of a company, particularly the income statement and the balance sheet, provide the basis for the determination of EVA and MVA. It must be recognized that the financial statements are drawn up according to GAAP, in order to conform to accounting constraints such as prudence (conservatism), consistency and the principles of realization and accrual.

The users of the financial statements of a company are a diverse group, which includes current and potential shareholders, lenders (banks and creditors), the Receiver of Revenue and others. As a result of the way in which the financial statements are set up, the figures contained in them are not presented primarily from an investor's point of view.

In order to determine the IC and operating profit as seen from an investor's point of view, the financial statements, which normally have a conservative accounting bias regarding capital and profits, must be adjusted appropriately. In this chapter the major adjustment items that have the most significant impact were discussed. These items typically include R&D costs, marketing costs, goodwill, strategic investments and deferred taxation.

For each of the adjustment items discussed, the adjustment required regarding the income statement (and specifically operating profits) and the balance sheet (and specifically the invested capital) was indicated. An example was given of how the most prevalent adjustments are done for a hypothetical company and of how the adjusted NOPAT and adjusted IC and EVA are calculated.

This was followed by a discussion of the link between EVA and MVA, showing that the value of MVA is equal to the PV of all expected future EVA the company will generate. In order to make the calculation for a given situation, an assumption about the expected future growth in EVA was made.

The discussion included the calculation of MVA under three different scenarios: no growth in EVA; constant expected growth in EVA; and initial abnormal growth, followed by constant growth. It was shown how MVA could be determined by using a different formula that calculates the expected future growth in EVA (FGV) separately. This formula, which incorporates the FGV, was shown to yield the same result as the normal formula.

The chapter concluded with a discussion of the link between MVA and NPV, showing that MVA and NPV give exactly the same answer. Both indicate the increase in shareholder wealth expected from investment in a certain project, or from investment in a company as a whole. NPV may be more appropriate for investment decision-making, while MVA (and EVA) is better suited to performance measurement and reward that leads to the maximization of shareholder wealth.

After the discussion of the concepts EVA and MVA, as well as the adjustments required to calculate their value, it is now appropriate to investigate further where EVA fits into the process of internal value management and how it relates to other financial management concepts. In the next chapter, the link between EVA, MVA and leverage is discussed.

CHAPTER 4

RELATIONSHIP BETWEEN LEVERAGE AND EVA AND MVA

4.1 INTRODUCTION

The objective of this chapter is to link management accounting techniques such as variable costing and cost-volume-profit analysis with financial management techniques such as leverage analysis and value analysis in order to determine how decisions or changes in input will affect the shareholder value. The leverage effect of the cost of equity is introduced as a new concept and it is illustrated how it reacts in conjunction with operating leverage and financial leverage to determine the total overall leverage of the company.

This new approach would be useful for decision-making purposes in assessing the impact of different decision alternatives such as the viability of marketing campaigns, changes in product combinations and capital expansion projects. Furthermore, the new approach will be useful in determining the effect of changes in internal factors like production costs or external factors like inflation and tax rates on profits and shareholder value. The findings of this analysis could be of value to managers at all levels in a business organisation, but especially to financial managers. Existing shareholders and potential investors would also benefit from the use of these techniques, but the company data required as inputs for the model would not be available to shareholders.

The determination of EVA and MVA was discussed in Chapter 3. The concept of leverage is now discussed briefly, followed by an illustration of the development and use of a spreadsheet model to extend the leverage analysis of profits to EVA and MVA. The leverage effect of the cost of equity on EVA and MVA is investigated. The initial hypothesis is that, similar to fixed costs and interest, the cost of equity also has a leverage effect on the profits (and EVA and MVA) of a business. It should be possible to quantify this leverage effect and to use it, together with the well-known operating leverage and financial leverage factors, to determine the total leverage for a company. Once the total leverage has been determined, it would be possible to predict what effect any change in input would have on profits, EVA and MVA.

An attempt is made to derive a formula (given certain assumptions) to predict what effect a particular change in volume (sales) would have on EVA and MVA. Finally, the impact of different levels of operating and financial leverage on profits, EVA and MVA is evaluated.

4.2 OPERATIONAL LEVERAGE, FINANCIAL LEVERAGE AND TOTAL LEVERAGE

“Operational leverage” (Correia *et al.* 2003; Gitman 2000; Ross *et al.* 1999) refers to the effect that fixed costs have on the volatility (and risk) of operating profits, given fluctuations in sales. The degree of operating leverage (DOL) is calculated as follows:

DOL = Contribution/Operating profit (after fixed costs)

where

Contribution = Sales minus all variable costs

The answer is a factor equal to one (in the case of zero fixed costs) or greater than one. A DOL factor of 1,8 means that for every 10% change in sales, the operating profit will change by 18% (all other things being equal).

Similarly, "financial leverage" refers to the effect of interest on debt on profits after interest, given fluctuations in sales. The degree of financial leverage (DFL) is calculated as follows:

DFL = Operating profit / Profit after interest

The answer is a factor equal to one (no interest) or greater than one and a DFL factor of 1,5 means that for every 10% change in operating profit, profit after interest changes by 15% (all other things being equal).

The combined effect, or "total degree of leverage" (TDL), is

TDL = DOL x DFL

or

TDL = Contribution / Profit after interest

A TDL of 1,8 x 1,5 = 2,7 means that for every 10% change in sales, the profit after interest changes by 27%.

4.3 LINK BETWEEN EVA, MVA AND LEVERAGE

In Section 3.9 of Chapter 3 it was indicated that, theoretically, MVA is equal to the PV of all future EVAs. On the assumption that there will be no future growth in the current EVA, or that the expected future growth in EVA will be at a constant rate, g, the theoretical MVA can be calculated as a perpetuity. The result shows that MVA is a multiple of the current EVA.

So, for example, Company A has a current EVA of R100 million. Its WACC is 20%. If no future growth in EVA is expected, the theoretical MVA can be calculated as follows:

MVA = PV (future EVA)
= current EVA / WACC

= R100 million / 0,2

= R500 million

In this instance, the MVA is five times the current EVA, or R500 million/R100 million.

If the EVA is expected to grow at a constant rate of 10% in future, the theoretical MVA can be calculated as follows:

MVA = PV(future EVA)

= current EVA / (WACC – g)

= R100 million / (0,2 – 0,1)

= R1000 million

With the assumption of 10% future growth in EVA, MVA is ten times the current EVA, or (R1000 million / R100 million). The fact that MVA is theoretically a multiple of the current EVA means that any percentage change in EVA should cause the same percentage change in MVA.

In Section 4.1 it was shown how the leverage effect of fixed costs and interest causes profits to change more dramatically than sales for a given percentage change in volume. If the cost of equity is subtracted from profits (after interest and tax), one gets EVA. If one assumes that the capital structure and the cost of equity percentage remain unchanged, the amount debited as the cost of equity in the calculation of EVA is a fixed amount. This fixed amount of the cost of equity also has a leverage effect that causes the EVA (and the theoretical MVA) to change more dramatically than profits when there are changes in the sales volume. The leverage effect of the cost of equity (referred to as EVA leverage) can now be investigated and combined with operational and financial leverage to study the effect on the profits and value of a business as a whole.

4.4 SPREADSHEET MODEL

A spreadsheet model was developed using different levels of operating leverage and financial leverage. The relationship between profits (after interest and tax) and EVA was determined. This was done by using the cost of own capital (equity) and this fixed amount can therefore be described as a leverage factor for EVA.

Furthermore, the EVA leverage factor was combined with the operating and financial leverage. It then became possible to illustrate how the expected percentage change in EVA and MVA can be predicted, given a certain percentage change in sales (or profits). The results of the model, using different scenarios (levels of leverage) were then analysed to reach conclusions and to allow some recommendations to be made.

4.5 MODEL ASSUMPTIONS AND INPUTS

The model assumptions and inputs are contained in Schedule A and are discussed briefly below. It was assumed that a company has "operational assets" consisting of fixed assets and net current assets of R2 million. These are financed by 60% equity capital and 40% long-term debt. This model is described as "average" financial gearing and it is also the optimal capital structure, yielding the lowest WACC of 17,4 %. The cost of equity at this level of gearing is assumed to be 22% and the after-tax cost of debt is 10,5%.

A tax rate of 30% and a return on assets before tax of 35% (24,5% after tax) are assumed. Furthermore, an asset turnover of 1 is assumed; meaning that the total assets of R2 million will yield sales of R2 million. The cost structure of variable costs of 40% of sales and fixed costs of R500 000 per year are considered "average".

In order to look at the effect of different cost structures (operational leverage), a high fixed cost structure was regarded as one where the variable costs are only 25% of sales and fixed costs are R800 000 per year. A "low" fixed cost structure was one where the variable costs are 55% of sales and the fixed costs are R200 000 per year.

The financial structure was also changed to illustrate the effect of different levels of financial leverage. As mentioned above, the optimal structure of 60% equity and 40% debt (WACC = 17,4%) is called “average” financial gearing. “High” financial gearing is the situation where 40% equity and 60% debt are used, giving a WACC of 18,1%. “Low” financial gearing was indicated by 80% equity and 20% debt, also giving a WACC of 18,1%. This points toward the fact that the WACC increases when the financial gearing changes to levels above or below the optimal level.

The model was based on the assumption that operating efficiencies, as indicated by measures such as the asset turnover, remain the same and that there is no inflation. Fixed costs therefore remain the same in the total amount and variable costs remain the same percentage of sales.

Different scenarios (as specified in Table 4.1) were created to identify the effects of gearing on profits, EVA and MVA.

Table 4.1: Assumptions and input items of spreadsheet model

1.	Capital structure (ave. fin. gearing)	Amount	Weight	Cost	Weighted
	Equity	R1 200 000	60%	22,00%	13,20%
	Debt	R800 000	40%	10,50%	4,20%
	Total assets	R2 000 000		**WACC**	17,40%
2.	Tax rate				30,00%
3.	Return on assets before interest and tax				35,00%
4.	Return on assets after tax				24,50%
5.	Interest rate before tax				15,00%
6.	Interest rate after tax				10,50%
7.	Asset turnover (total sales / total assets)				1
8.	Variable costs as percentage of sales				40,00%
9.	Fixed costs per year (for average level of operating leverage)				R500 000
10.	MVA assumption 1: EVA remains same in perpetuity (no growth)				
11.	MVA assumption 2: Constant EVA growth, growth percentage (note 1)				5,00%
12.	MVA assumption 3: Abnormal growth year 1-5, growth percentage				15,00%
13.	Total assets = Fixed assets + net current assets				
14.	Average capital structure: 60% equity and 40% debt is optimal (WACC 17,4%)				
15.	“High leverage” 40% equity and 60% debt (K_{equity} = 29,5%; WACC = 18,1%)				
16.	“Low leverage” 80% equity and 20% debt (K_{equity} = 20%; WACC = 18,1%)				
17.	Fixed costs “Average” = R500 000, Variable costs 40% of sales =				R800 000
	“High” = R800 000, variable costs 25% of sales =				R500 000
	“Low” = R200 000, variable costs 55% of sales =				R1 100 000

18. Scenarios:

	Fixed costs	Financial gearing
1	Average	Average (optimal)
2	High	Low
3	High	High
4	Low	Low
5	Low	High

Note 1: If EVA is negative at the outset (base case), constant growth causes EVA to become more negative in future.

4.6 MODEL OUTPUT AND LEVERAGE FACTORS

Table 4.2 shows the calculation of profits, EVA, MVA as well as the leverage factors for Scenario 1 where average levels of operating leverage and financial leverage are maintained.

- Sales minus the variable costs give the contribution. When the fixed costs are subtracted from the contribution, the result is net operating profit.
- Next the interest is subtracted to give profit before tax and after subtracting the tax, the profit after tax remains. In order to calculate the EVA, the cost of own capital is subtracted from profit after tax.
- The cost of equity is calculated as 22% x R1 200 000 = R264 000. An alternative calculation, using the WACC, is used to confirm the EVA.

The MVA is calculated in three ways, allowing for three different assumptions about future growth in EVA. The first version of MVA (MVA_1) is calculated as if there will be no future growth in EVA. The calculation is simply this:

MVA_1 = EVA / WACC, or R142 000 / 0,174 = R816 092.

The second version of MVA (MVA_2) assumes a constant future growth rate of 5% in EVA. The calculation is as follows:

MVA_2 = EVA (1 + g) / (WACC – g)

(R142 000 x 1,05) / (0,174 – 0,05) = R1 202 419.

The third version of MVA (MVA_3) assumes an abnormal growth rate in EVA of 15% for the first five years and a constant growth rate of 5% after that. The calculation of MVA_3 projects the future EVAs at the abnormal growth rate of 15% for the first five years and then at 5% in perpetuity.

MVA_3 = R142 000 $(1,15)$ / 1,174 + R142 000 $(1,15)^2$ / $1,174^2$ + R142 000 $(1,15)^3$ / $1,174^3$ + R142 000 $(1,15)^4$ / $1,174^4$ + R142 000 $(1,15)^5$ / $1,174^5$ + [R142 000 $(1,15)^5$ x (1,05) / (0,174 – 0,05)] / $1,174^5$ = R1 752 063.

As a check for the reasonableness of this calculation, the total market value of equity was calculated and divided by the book value to give the market : book ratio. The ratios calculated for all three versions of MVA range from 1,68 to 2,46 and are considered reasonable. Another test for reasonableness is the MVA/EVA multiple. It ranges from 5,75 for MVA_1 to 12,34 for MVA_3. This is in line with the research findings of Stern Stewart Consulting Company, cited by Ehrbar (1998:78) namely that “each $1 increase in EVA brings, on average, a $9,50 increase in MVA”.

Table 4.2a

Base case scenario 1: Average fixed costs and average financial gearing

Income Statement and EVA and MVA	**Current**
Sales	R2,000,000
Variable costs	R800,000
Contribution	R1,200,000
Fixed costs	R500,000
Net operating profit	R700,000
Interest	R120,000
Profit before tax	R580,000
Tax	R174,000
Profit after tax	R406,000
Cost of equity	R264,000
EVA	R142,000

Confirmation of EVA calculation:

EVA = Return Spread x IC
= (ROIC – WACC) x IC
= (24,5% - 17,4%) x R2 million
= 7,1% x R2 million
= R142 000

	Current	**MVA/EVA Multiple**	**Tot Assets**	**Tot MV**	**MV Debt**	**MV Equity**	**BV Equity**	**Market/ Book**
MVA_1 (Current EVA in perpetuity; no growth)	R816,092	5.75	R2,000,000	R2,816,092	R800,000	R2,016,092	R1,200 000	1.68
MVA_2 (Constant growth % in EVA)	R1,202,419	8.47	R2,000,000	R3,202,419	R800,000	R2,402,419	R1,200,000	2.00
MVA_3 (Abnormal growth in year 1-5; then constant)	R1,752,063	12.34	R2,000,000	R3,752,063	R800,000	R2,952,063	R1,200,000	2.46
Calculation: Period 1 EVA, abnormal growth	R163,300							
Period 2	R187,795							
Period 3	R215,964							
Period 4	R248,359							
Period 5	R285,613							
Period 5 Constant growth in perpetuity	R2418,495							
DOL = Contribution/ Operating profit	1.7143							
DFL = Operating profit/Profit after interest	1.2069							
TDL = DOL x DFL	2.0690							
EVA leverage factor = Profit after tax/EVA	2.8592							
Total leverage including EVA = TDL x EVA leverage	5.9155							

Table 4.2b

Scenario 1: Average fixed costs and average financial gearing

Income Statement and EVA and MVA	**Sales – 20%**	**Sales – 10%**	**Current**	**Sales + 10%**	**Sales + 20%**
Sales	R1,600,000	R1,800,000	R2,000,000	R2,200,000	R2,400,000
Variable costs	R640,000	R720,000	R800,000	R880,000	R960,000
Contribution	R960,000	R1,080,000	R1,200,000	R1,320,000	R1,440,000
Fixed costs	R500,000	R500,000	R500,000	R500,000	R500,000
Net operating profit	R460,000	R580,000	R700,000	R820,000	R940,000
Interest	R120,000	R120,000	R120,000	R120,000	R120,000
Profit before tax	R340,000	R460,000	R580,000	R700,000	R820,000
Tax	R102,000	R138,000	R174,000	R210,000	R246,000
Profit after tax	R238,000	R322,000	R406,000	R490,000	R574,000
Cost of equity	R264,000	R264,000	R264,000	R264,000	R264,000
EVA	-R26,000	R58,000	R142,000	R226,000	R310,000
MVA$_1$ (Current EVA in perpetuity; no growth)	-R149,425	R333,333	R816,092	R1,298,851	R1,781,609
MVA$_2$ (Constant growth % in EVA)	-R220,161	R491,129	R1,202,419	R1,913,710	R2,625,000
MVA$_3$ (Abnormal growth in year 1-5; then constant growth)	-R311,345	R694,539	R1,700,423	R2,706,308	R3,712,192
Calculation: Period 1 EVA, abnormal growth:	-R29,900	R66,700	R163,300	R259,900	R356,500
Period 2	-R34,385	R76,705	R187,795	R298,885	R409,975
Period 3	-R39,543	R88,211	R215,964	R343,718	R471,471
Period 4	-R45,474	R101,442	R248,359	R395,275	R542,192
Period 5	-R52,295	R116,659	R285,613	R454,567	R623,521
Period 5 Constant growth in perpetuity	-R421,736	R940,796	R2,303,328	R3,665,861	R5,028,393

Test: For every 10% change in Sales:

Operating profit changes by:	17.143% (leverage effect of fixed operating costs)
Profit after interest and tax by:	20.690% (leverage effect of fixed operating costs & interest)
EVA by:	59.155% (leverage effect of fixed operating costs, interest and cost of equity)
MVA (multiple of EVA) by:	59.155% (leverage effect of fixed operating costs, interest and cost of equity)

Table 4.3

All scenarios					
Income Statement and EVA and MVA	**Scenario 1**	**Scenario 2**	**Scenario 3**	**Scenario 4**	**Scenario 5**
Sales	R2,000,000	R2,000,000	R2,000,000	R2,000,000	R2,000,000
Variable costs	R800,000	R500,000	R500,000	R1,100,00	R1,100,00
Contribution	R1,200,000	R1,500,000	R1,500,000	R900,000	R900,000
Fixed costs	R500,000	R800,000	R800,000	R200,000	R200,000
Net operating profit	R700,000	R700,000	R700,000	R700,000	R700,000
Interest	R120,000	R60,000	R180,000	R60,000	R180,000
Profit before tax	R580,000	R640,000	R520,000	R640,000	R520,000
Tax	R174,000	R192,000	R156,000	R192,000	R156,000
Profit after tax	R406,000	R448,000	R364,000	R448,000	R364,000
Cost of equity	R264,000	R320,000	R236,000	R320,000	R236,000
EVA	R142,000	R128,000	R128,000	R128,000	R128,000
MVA_1 (Current EVA in perpetuity; no growth)	R816,092	R707,182	R707,182	R707,182	R707,182
MVA_2 (Constant growth % in EVA)	R1,202,419	R1,025,954	R1,025,954	R1,025,954	R1,025,954
MVA_3 (Abnormal growth in year 1-5; then constant growth)	R1,752,063	R1,489,520	R1,489,520	R1,489,520	R1,489,520
Calculation: Period 1 EVA, abnormal growth:	R163,300	R147,200	R147,200	R147,200	R147,200
Period 2	R187,795	R169,280	R169,280	R169,280	R169,280
Period 3	R215,964	R194,672	R194,672	R194,672	R194,672
Period 4	R248,359	R223,873	R223,873	R223,873	R223,873
Period 5	R285,613	R257,454	R257,454	R257,454	R257,454
Period 5 Constant growth in perpetuity	R2,418,495	R2,063,560	R2,063,560	R2,063,560	R2,063,560
DOL = Contribution / Operating profit	1.7143	2.1429	2.1429	1.2857	1.2857
DFL = Operating profit / Profit after interest	1.2069	1.0938	1.3462	1.0938	1.3462
TDL = DOL x DFL or Contribution / Profit after interest	2.0690	2.3438	2.8846	1.4063	1.7308
EVA leverage factor = Profit after tax / EVA	2.8592	3.5000	2.8438	3.5000	2.8438
Total leverage including EVA = TDL x EVA leverage	5.9155	8.2031	8.2031	4.9219	4.9219

The leverage factors were calculated as follows:

DOL	= contribution / operating profit
	= 1 200 000 / 700 000
	= 1,7143

This means that for every 1% change in sales (or contribution), the Operating Profit changes by 1,7143%.

DFL	= operating profit / profit after interest
	= 700 000 / 580 000
	= 1,2069

This means that for every 1% change in Operating Profit, Profit After Interest changes by 1,2069%.

TDL	= DOL x DFL
	= 1,7143 x 1,2069
	= 2,0690

This means that for every 1% change in sales (or contribution) the Profit After Interest changes by 2,0690%.

When EVA is calculated, the cost of own capital is a fixed charge that also represents a leverage factor that causes the EVA and MVA to fluctuate more drastically than a given percentage change in sales. This “EVA” leverage effect is caused by the cost of own capital (equity) and is calculated as follows:

EVA leverage	= profit after interest and tax / EVA
	= 406 000 / 142 000
	= 2,8592

This means that for every 1% change in profit after interest and tax, EVA changes by 2,8592%. If this is combined with the TDL already calculated, then

Total leverage including EVA	= TDL x EVA leverage factor, or
	= contribution x (1 – tax rate) / EVA
	= 2,0690 x 2,8592
	= 5,9155

This means that for every 1% change in sales (or contribution), EVA (and MVA) changes by 5,9155%. Because MVA is a multiple of EVA, the percentage change in MVA is the same as that for EVA, given a certain percentage change in sales.

In Table 4.2b the effect of changes of –20%; -10%; +10% and +20% on sales was calculated to verify the correctness of the leverage factors for Scenario 1. The inputs of the spreadsheet set out in Table 4.1 were then changed for each of the other scenarios (2 to 5). The results are summarised in Table 4.3. Due to the repetitive nature of the exercise for each scenario, the equivalent spreadsheets for the other scenarios are not included here.

4.7 RESULTS OF THE ANALYSIS

The different levels of operating leverage for each of the five scenarios are set out in Figure 4.1. It is obvious that the operational leverage factors (as a result of fixed costs) are highest for Scenarios 2 and 3. Figure 4.2a shows the DFL for each scenario. Scenarios 3 and 5 stand out as those with the highest DFL (on account of their high level of long-term debt).

Figure 4.1: DOL for each scenario

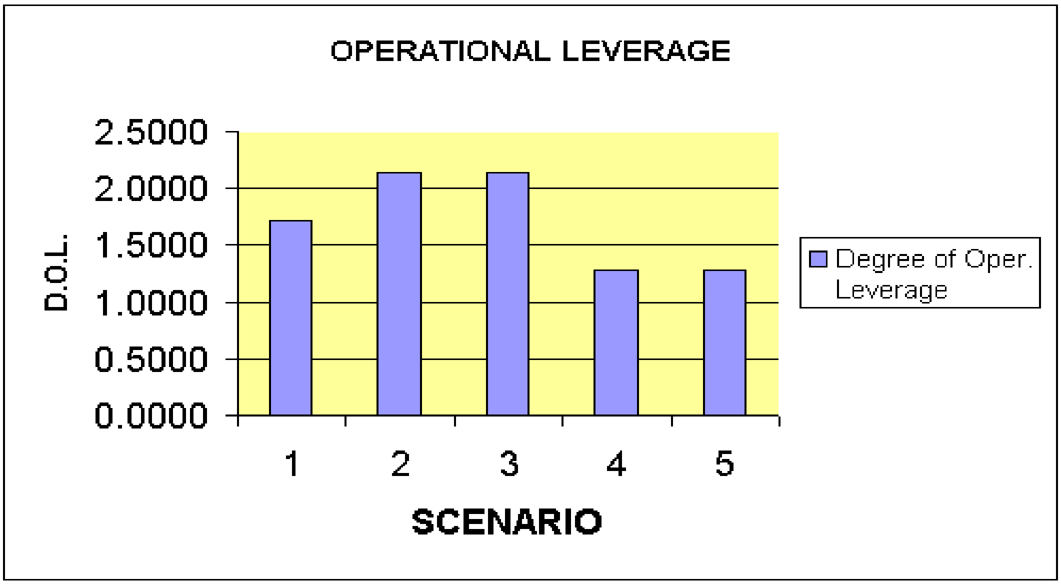
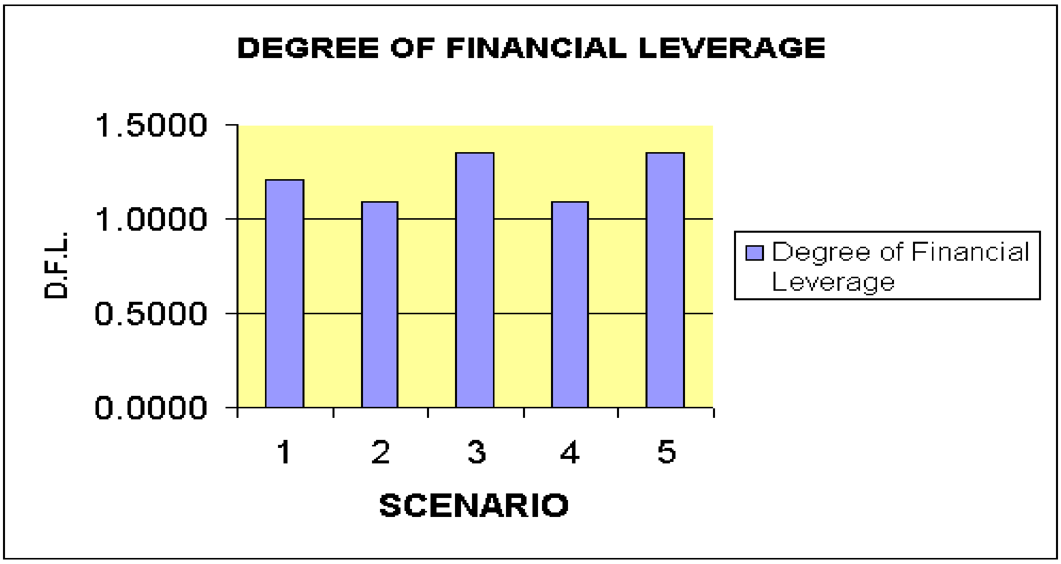


Figure 4.2: DFL for each scenario



As the degree of EVA leverage is dependent on the size of own (equity) funding, one would expect this leverage factor to contrast with the financial leverage situations. This expectation is borne out by Figure 4.3, which shows that the degree of EVA leverage is indeed highest for those scenarios where the financial gearing is low, namely Scenarios 2 and 4. It is interesting to note that the degree of EVA leverage is the same for the same level of financial gearing, Scenarios 2 and 4 (high) and Scenarios 3 and 5 (low).

Figure 4.3: Degree of EVA leverage for each scenario

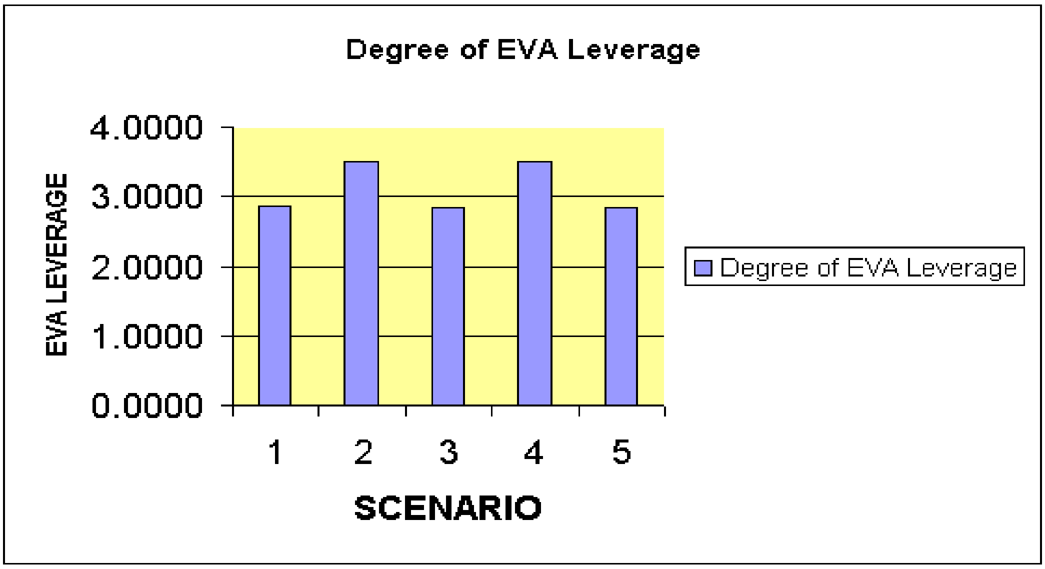


Figure 4.4: Total leverage including EVA for each scenario

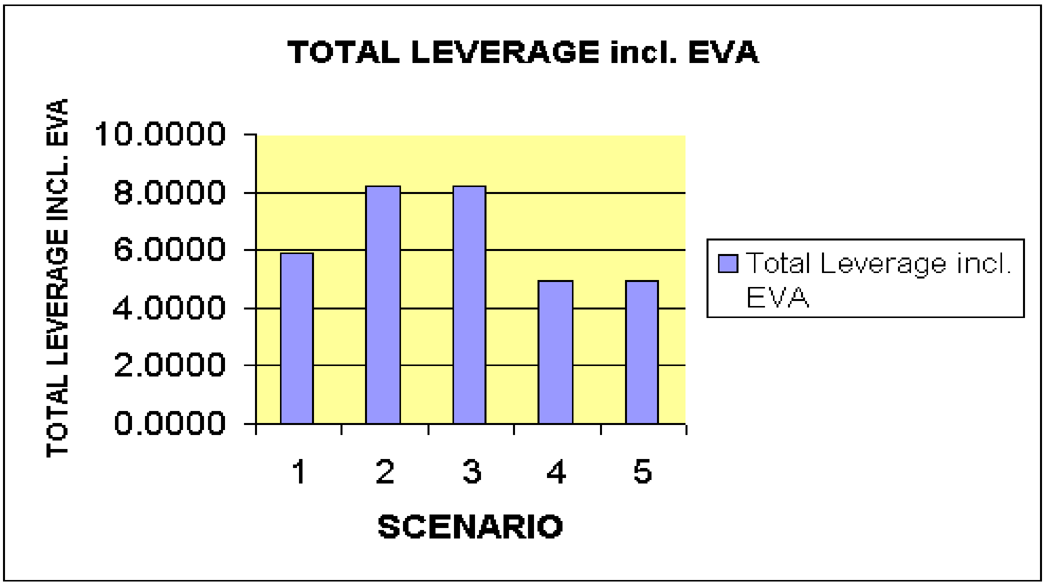


Figure 4.4 shows the total degree of leverage, including EVA. The scenarios with the highest total leverage, including EVA factors, are Scenarios 2 and 3, which also have the highest levels of fixed costs. Furthermore, the total leverage including EVA

factors is considerably lower for scenarios with low fixed costs, such as Scenarios 4 and 5. In addition, the factors are the same for scenarios with the same level of fixed costs, namely Scenarios 2 and 3 (high) and Scenarios 4 and 5 (low). From this one can conclude that the total degree of leverage including EVA is not affected by the financial gearing, but only by the operational gearing (given that the WACC is the same for the different levels of financial gearing).

Figure 4.5: Effect of changes in sales on net operating profit

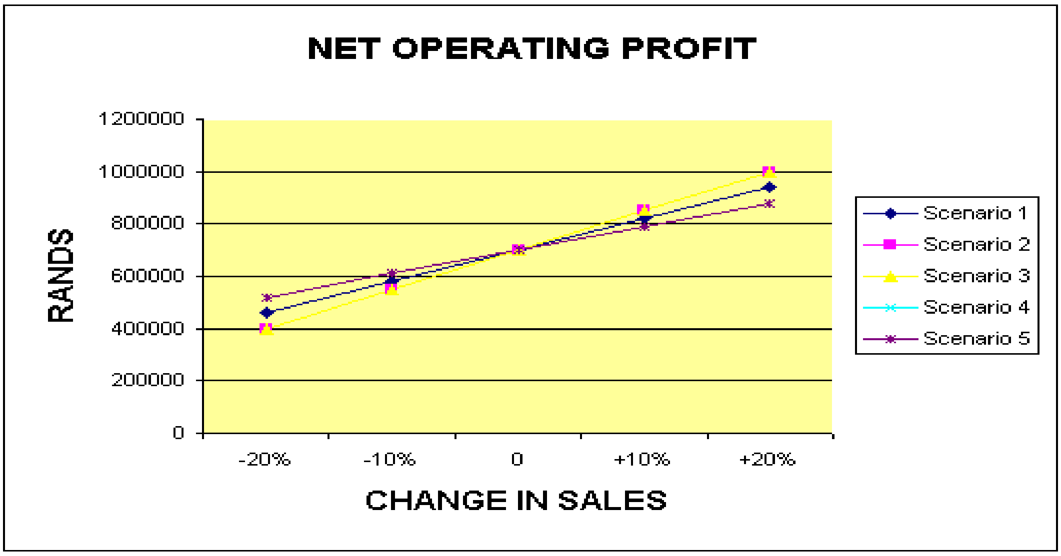


Figure 4.6: Effect of changes in sales on profit after tax and interest

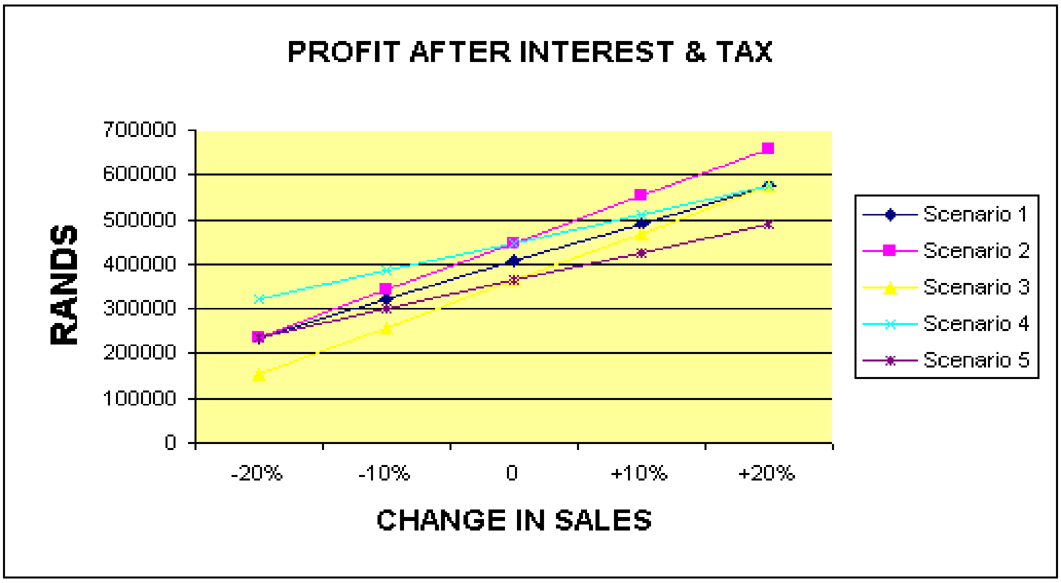


Figure 4.5 indicates the effect of operational leverage. It shows that the effect of a change in sales is more drastic for scenarios with higher fixed costs, namely Scenarios 2 and 3, than for the other scenarios. Figure 4.6 shows the combined effect of operational leverage and financial leverage on profit after interest and tax. As expected, the greatest volatility was found in the scenarios with the highest total degree of leverage, namely Scenarios 2 and 3.

Figure4.7: Effect of changes in sales on EVA

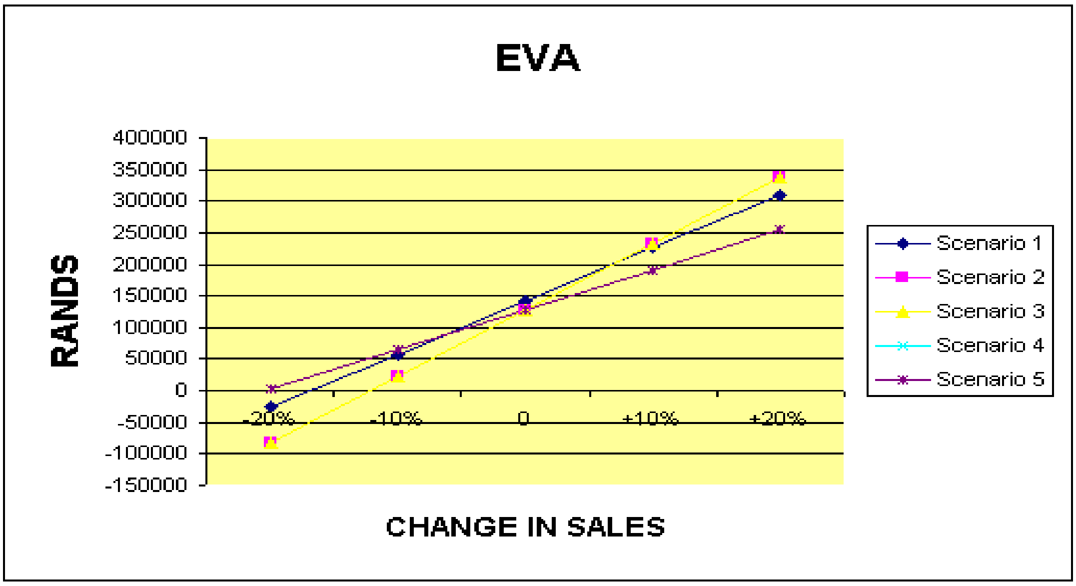


Figure 4.8: Effect of changes in sales on MVA

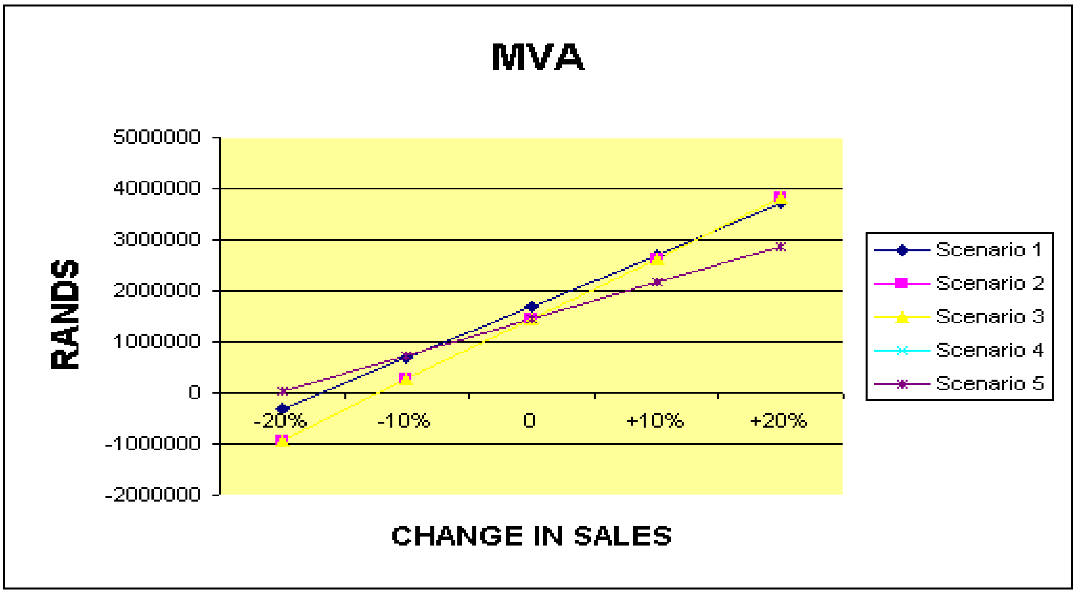


Figure 4.7 shows the effect of changes in sales on EVA. As expected, the scenarios with the highest total leverage including EVA, namely Scenarios 2 and 3, showed the greatest volatility in EVA for changes in sales. Finally, Figure 4.8 shows the effect of changes in sales on MVA_3. Again, the scenarios that were the most volatile were the ones with the highest total leverage including EVA, namely Scenarios 2 and 3.

4.8 CONCLUSION

The spreadsheet model was used to investigate the leverage effect of three items, namely fixed costs (DOL), interest on borrowed capital (DFL) and the cost of own capital (EVA leverage). Five different scenarios, each with a different level of DOL, DFL or EVA leverage, were assumed to determine the relationships (if any) between the different kinds of leverage as well as their impact on profits, EVA and MVA (and therefore, also the value of the firm).

The results indicated that the size of the total level of leverage including EVA is determined by all three elements causing the leverage. However, there was no difference in the total leverage including EVA for scenarios where only the financial gearing differed. The analysis showed that the effect of high financial leverage is offset perfectly by the lower cost of own capital (EVA leverage). Stated differently, the total leverage including EVA is the same for all scenarios with the same fixed costs (only if WACC remains constant).

Given the assumptions made, one can conclude that the organisation's sensitivity to changes in sales volume is determined by its degree of operational leverage and by its total cost of capital (as represented by the financial leverage and EVA leverage). The way the company is financed (assuming there is no change in the WACC) will not affect this total leverage effect.

It is recommended that companies make use of the suggested spreadsheet model in order to investigate and analyse the effects of changes in sales and other input items (such as selling prices, costs and the cost of capital) on the crucial performance measures of EVA and MVA. As illustrated, these changes in EVA and MVA represent a direct quantification of shareholder value creation. The techniques discussed can be applied in performance measurement, valuations, cost/volume/profit analysis, sensitivity analysis, value management and scenario planning. The techniques can even be used to develop a performance-based reward system for all the employees of a company that create value for its shareholders (a company that has a positive EVA).

Further research could focus on the effect that other factors, such as changes in the financial structure and costs, would have on EVA and MVA. Empirical studies could be conducted by using the data of listed companies to investigate these leverage effects in practice, and by using the suggested spreadsheet model.

This chapter has related the concepts of EVA and MVA to leverage and investigated the effect of changes in sales on operating profits, profit after interest, EVA and MVA. The next chapter discusses the components that determine EVA.

CHAPTER 5

CALCULATING EVA COMPONENTS

5.1 INTRODUCTION

In this chapter the various components that make up the EVA calculation are evaluated and quantified. EVA can be calculated in different ways, as discussed in Chapter 3. If one looks at EVA from a residual income point of view, the full cost of capital (consisting of own funds and borrowed funds) is subtracted from operating profits to yield the residual income or EVA. In this case, the following formula would be appropriate:

EVA = NOPAT – Capital charge based on IC
= NOPAT – WACC x IC

If the profit after interest and tax is taken as a point of departure, only the cost of own capital needs to be subtracted in order to get the residual income, as reflected by EVA. In this instance, the formula above can also be rewritten as follows:

EVA = Earnings after interest and tax – cost of own capital
= Earnings after interest and tax – (k_e x book value of equity)

where

k_e = component cost of equity

Using a different perspective (more specifically, one that compares the actual returns with the cost of capital), the company's internal success or failure in creating value can be measured by determining the performance spread between ROIC and WACC. The formula for EVA can then be stated as follows:

EVA = Performance spread x IC
= (ROIC – WACC) x IC

where
ROIC = NOPAT / IC

The components of this version of the EVA formula, which clearly shows whether the company is creating or destroying value, are analysed and discussed below. It is assumed that the required adjustments, as discussed in Chapter 5, have already been made. The components are:

- ROIC;
- WACC;
- the performance spread; and
- IC.

5.2 ROIC

The ROIC is calculated by taking the adjusted NOPAT and dividing it by the adjusted IC.

ROIC = NOPAT / IC

NOPAT is the profit that remains after subtracting all operating expenses, including depreciation and cash taxes, from sales revenue, but excluding interest on loans.

So, for example, assume the following financial results for a company:

	R million
Sales revenue	100
Cost of sales	(32)
Gross profit	68
Other operating expenses	(18)
Earnings before interest and tax (EBIT)	50
Less interest	(10)
Earnings before tax (EBT)	40
Tax (including deferred tax) 30%	(12)
Earnings after tax (EAT)	38

If it is furthermore assumed that the actual cash tax rate is 20% of EBIT, then NOPAT can be determined as follows:

EBIT	50
Less cash tax 20%	(10)
NOPAT	40

If the normal tax rate is 30%, then the tax debit in the income statement is 30% of EBIT. However, the cash tax rate is taken as 20% because tax allowances lead to a provision for deferred tax, which in turn means that the tax actually payable in the current year is less than the tax debit in the income statement. If the adjusted IC (at book value at the beginning of the period) amounts to an amount of R100 million, the ROIC can be calculated as follows:

ROIC = NOPAT / IC

= R40 million / R100 million

= 40%

The book value of IC at the beginning of the period is used because it is the basis on which the return is earned during the year.

The calculation of ROIC can also be divided into three components, as follows:

$$
\begin{aligned}
\text{ROIC} &= \text{EBIT / Sales} \times \text{Sales / IC} \times (1 - \text{cash tax rate}) \\
&= 50 / 100 \times 100 / 100 \times (1 - 0{,}20) \\
&= 50\% \times 100\% \times 80\% \\
&= 40\%
\end{aligned}
$$

This indicates that ROIC can be increased by means of the following:

- an improvement in the operating margin, by generating the maximum profit per Rand of sales;

- an increase in the asset turnover, by maximizing the amount of sales generated by the assets used to generate the sales (capital efficiency); and/or

- a reduction in the effective tax rate, by ensuring that all tax allowances and subsidies are utilised optimally.

This section can be concluded by asserting that ROIC is a function of three factors, namely the operating profit margin on sales, the asset turnover and the effective tax rate (Hawawini and Viallet, 1999:493).

5.3 WEIGHTED AVERAGE COST OF CAPITAL (WACC)

The cost of a company's capital depends on the sources of finance used, as well as the combination (or weights) of each source of finance. Typical categories for financial sources are equity (own share capital and reserves), preferred share capital and debt. The term "component cost" is used to describe the cost (as a percentage) of a specific source of finance.

Suppliers of finance, such as shareholders and financial institutions, require compensation for the risk they take in investing in a given company. Since the suppliers of debt are paid their interest first (before shareholders can get dividends) and the interest expense is tax-deductible for the company, the cost of debt is usually cheaper than the cost of equity.

The appropriate weights to be used depend on the target capital structure of a company (see Section 5.3.2), which may differ from current financial gearing as reflected in the balance sheet. Furthermore, market values, rather than book values, should be used to determine the weights because they reflect the economic values of the finance used.

The calculation of the WACC is calculated as follows:

$$\text{WACC} = w_1k_e + w_2k_p + w_3k_d$$

where

w_1	=	weight of equity;
k_e	=	component cost of equity;
w_2	=	weight of preference share capital;
k_p	=	component cost of preference share capital;
w_3	=	weight of debt; and
k_d	=	cost of debt.

The determination of the weights and the component cost of each source of capital are discussed below.

5.3.1 Weighting sources of finance

It is assumed that the following summarized balance sheet represents the target capital structure of a hypothetical company.

Balance Sheet on 30 June 2002	**R million**
Non-current assets	75
Net current assets	25
	100
Ordinary share capital and reserves (equity)	60
Preference share capital (12%)	10
Long-term loan (15% interest)	30
	100

The capital structure (in terms of the book values) as reflected by the ratio of equity to preference capital to debt is the following:

Book value of equity	:	Book value of preference capital	:	Book value of debt
R60 million	:	R10 million	:	R30 million

If all three elements of the ratio are divided by the hypothetical company's total net assets of R100m, the ratio becomes

0,6	:	0,1	:	0,3

From the ratio above, it is clear that the use of book values would result in weights of 0,6 for equity, 0,1 for preference shares and 0,3 for debt. However, market values are preferred to book values, because new capital has to be raised at market values. Copeland *et al.* (1996:248) support this view, saying: "Employ market value weights for each financing element because market values reflect the true economic claim of each type of financing outstanding, whereas book values usually do not".

The use of market values can be applied to the previous example and illustrated as follows: if there are 10 million issued ordinary shares (at a book value of R6 per share) and the current share price is R16, then the market value of equity is R160 million, which is ten million shares multiplied by the price of R16 per share.

If it is assumed that the current market rate on preference shares is 12% and the current interest rate is 15%, then the market value of the preference shares and debt is the same as the book value, which is R10 million and R30 million respectively. In terms of the market values, the equity : preference capital : debt ratio is the following:

Market value of equity : Market value of preference capital : Market value of debt

R160m	:	R10m	:	R30m

If each component of the ratio is divided by the sum total of the market value of equity, the market value of preference capital and the market value of debt, (R200 million in total), the ratio is

0,8	:	0,05	:	0,15

Therefore the correct weights to be used to determine WACC would be 0,8 for equity, 0,05 for preference capital and 0,15 for debt.

5.3.2 Optimal capital structure

The optimal (target) capital structure is the combination of equity, preference capital and debt that will maximize the value of the business as a whole, all other things being equal. The target capital structure is the combination of long-term sources of finance that leads to the lowest WACC. In this section, the principles and guidelines used to determine the optimal capital structure are evaluated and discussed.

The capital structure of a company is usually expressed in terms of a debt effect, for example, the debt : equity ratio, or the debt : assets ratio. While it is not possible to provide a formula for the most effective (optimal) capital structure for all companies, a framework can be provided along with the most important factors to be considered in estimating the optimal structure for a given company.

In order to approach the problem systematically, one needs to make some initial adjustments and then relax some of the assumptions in a stepwise way. The first scenario that is discussed is one where there are no taxes and no financial distress (bankruptcy) costs.

5.3.2.1 No taxes and no financial distress costs

When one compares the financial results of a fully equity-financed company with those of a company that uses debt, one sees that the financial results of a company with debt finance could be more volatile. This is so because of the interest cost, which remains unchanged, irrespective of the level of sales.

Financial gearing has the effect that when profit before interest (EBIT) is increased by a certain percentage, profit after interest (EBT) rises by an even bigger margin, because of the fact that the interest cost remains the same. If sales decrease, there is a negative gearing effect, because the interest expense again remains the same and the resulting percentage decrease in profits is more pronounced than that of sales.

The operational fixed costs have the same leverage effect as the interest expense. This is referred to as the operational leverage of the company. An astute financial manager seeks to balance the total leverage of the company, which consists of the operational leverage and the financial leverage. The effect of financial leverage is illustrated in the example below.

For example, assume a company with total assets of R200 million (100% equity-financed) and 10 million ordinary shares, forecasts the following:

State of economy	Recession	Moderate	Boom
	R million	R million	R million
Sales	80	100	120
Less variable operational costs (20%)	16	20	24
Contribution	64	80	96
Less fixed operational costs	20	20	20
Earnings before interest and tax (EBIT)	44	60	76
(assume there is no tax)			
Earnings per share (EBIT / 10m)	R4,40	R6,00	R7,60

If some debt is used and the following is assumed: total assets of R200 million (60% equity-financed), 6 million ordinary shares and 40% debt:

State of economy	Recession	Moderate	Boom
	R million	R million	R million
Sales	80	100	120
Less variable operational costs (20%)	16	20	24
Contribution	64	80	96
Less fixed operational costs	20	20	20
EBIT	44	60	76
Less interest at 10%	8	8	8
Earnings before and after tax (no tax)	36	52	68
EPS (EBIT / 6million)	R6,00	R8,67	R11,33

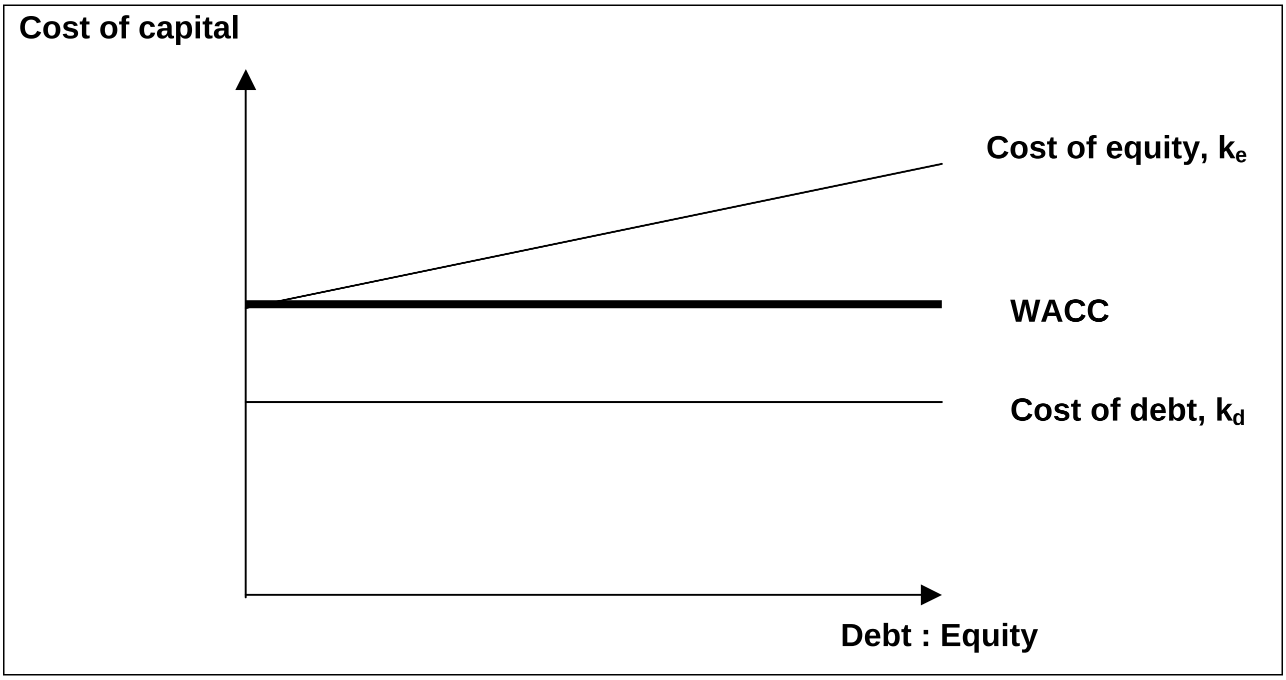
From the example it is clear that purely replacing equity finance with debt finance can increase the EPS of the hypothetical company. This financial leverage effect increases the volatility of profits (as measured by EPS). It works well when EBIT increases, but it also magnifies the decrease in EPS when EBIT drops.

In spite of the fact that the introduction of debt financing seems to increase the profitability of a company, Nobel Prize winners Miller and Modigliani (1961:411) assert that the value of a firm is not determined by the way in which it is financed. Assuming conditions of no taxes and no financial distress costs (for example, legal costs and losing customers because of the threat of liquidation), they argue that the component cost of equity simply adjusts upwards for the increased risk associated with higher levels of debt finance and, as a consequence, the WACC remains the same.

Since the cash flow stream generated by the assets does not change and the WACC remains the same, the value of the firm does not change. This phenomenon is in line with the so-called Pizza Theory that argues that the size of a pizza (the company) cannot be increased by slicing it into more pieces.

In the absence of taxes, the WACC at different levels of debt financing can be shown as in Figure 5.1.

Figure 5.1: WACC for different levels of financial gearing, no taxes



Source: Hawawini & Viallet (1999:350)

Figure 5.1 shows that the cost of equity increases as the debt : equity ratio increases, but that WACC remains the same for all levels of financial gearing. This is so because the increase in WACC due to the increase in k_e is offset perfectly by the decrease in WACC due to the greater weight given to the cheaper cost of debt, k_d.

5.3.2.2 Income taxes and no financial distress costs

When income taxes are introduced, the component cost of debt (k_d) is the after-tax cost, because the receiver of revenue finances part of the interest-expense by allowing a deduction for tax purposes. If the interest rate is 15% and the tax rate is 30%, the after-tax cost of debt is 10,5%.

In this scenario, the value of the firm increases by the present value of the annual amount of tax relief received on the interest. This can be calculated as follows:

$$\text{Annual interest tax shield} = t \times k_d \times \text{Debt}$$

where

t	=	tax rate
k_d	=	% cost of debt before tax

The value of the leveraged firm (with debt financing) relative to an unleveraged firm is calculated as follows:

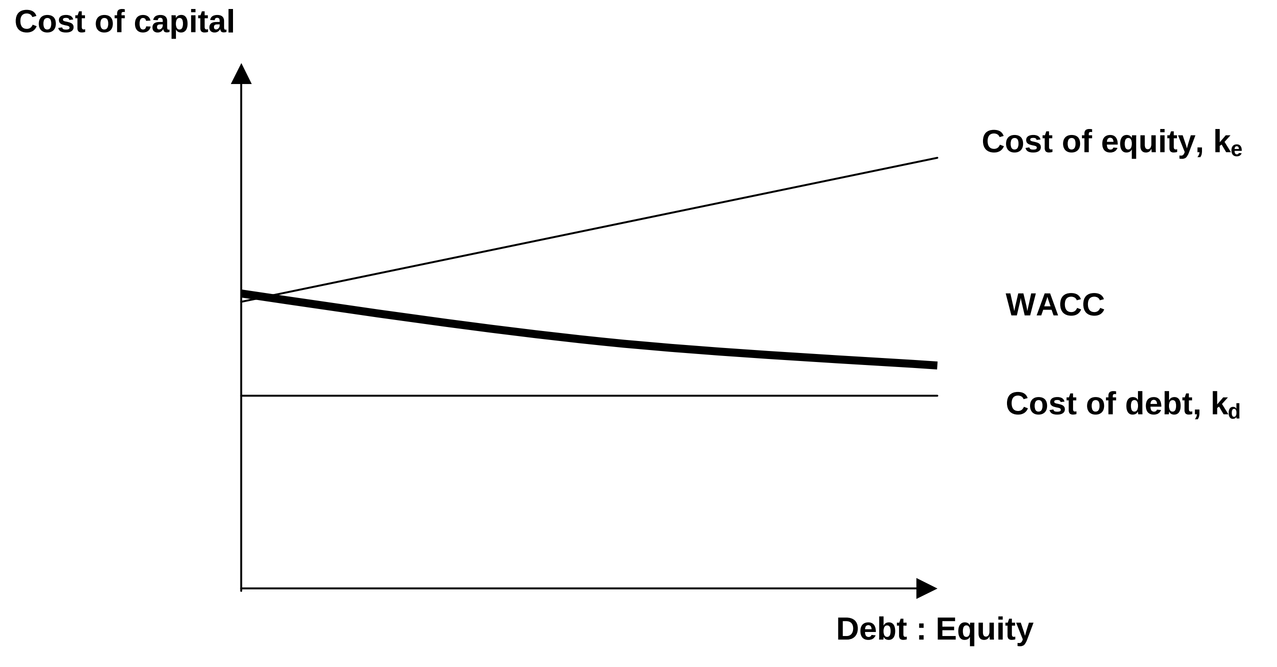
$$V_l = V_u + PV_{ITS}$$

where

V_l	=	value of leveraged firm
V_u	=	value of unleveraged firm
PV_{ITS}	=	present value of income tax shield

In this scenario, WACC does indeed decrease with higher levels of borrowed capital, as illustrated in Figure 5.2.

Figure 5.2: WACC for different levels of financial gearing, with taxes



Source: Hawawini and Viallet (1999:359)

When income tax is introduced, the lower after-tax cost of debt causes the WACC to decrease with higher levels of borrowings. If there are no financial distress costs, one can wrongfully conclude that 100% debt financing is optimal.

5.3.2.3 Taxes and financial distress costs

As a company uses more and more debt, its legal interest obligation becomes larger and larger, putting more and more pressure on the business to survive. Financial distress costs resulting from too much debt actually decrease the value of the firm (shrinks the pizza).

The direct financial distress costs are the costs of going bankrupt. They consist mostly of legal and administrative fees. There are also significant indirect costs of financial distress. These are associated with the danger that the firm may go bankrupt and they usually cause a firm to operate at a level lower than maximum capacity.

Profitable investment opportunities may have to be given up and discretionary costs such as research and development and marketing may have to be reduced. Important employees may leave the company; customers may switch to other companies and even suppliers may be hesitant to grant credit to the company.

The negative impact of these financial distress costs increases the risk and decreases the value of the firm as a whole. Taking this into account, the value of the leveraged firm can be calculated as follows:

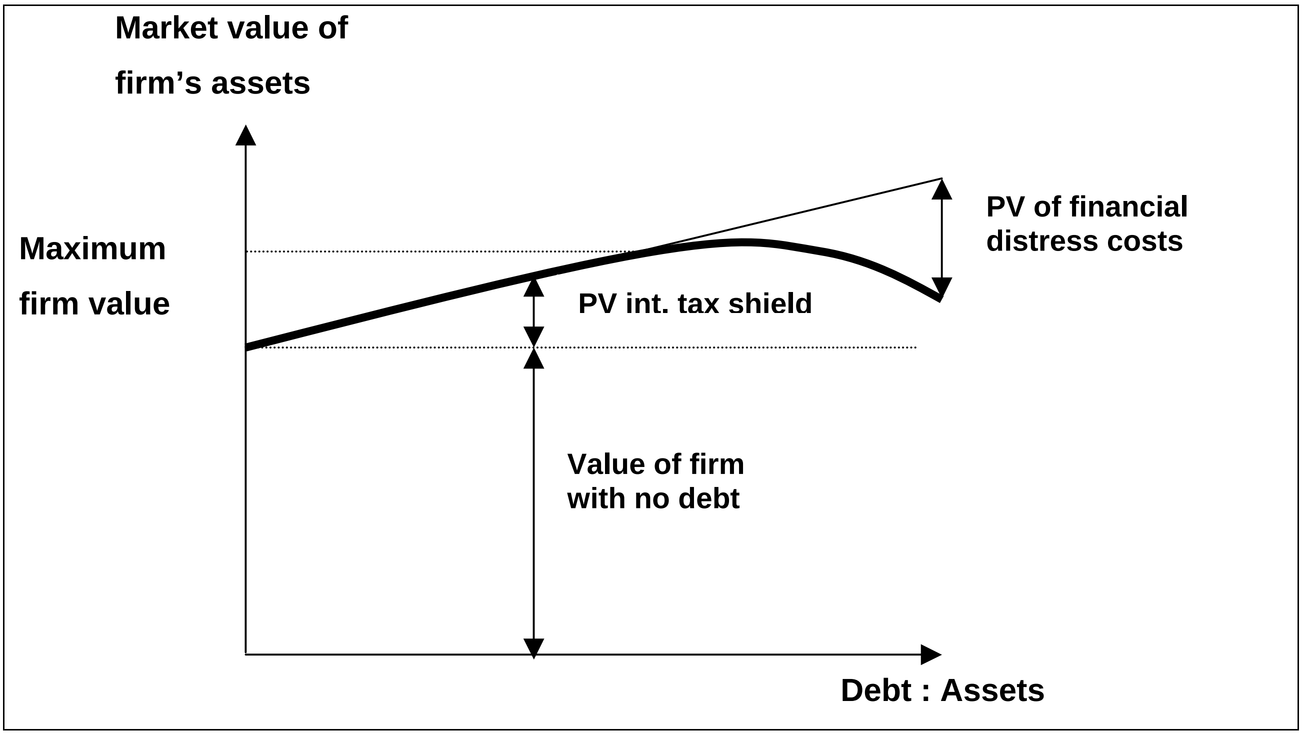
$$V_l = V_u + PV_{ITS} + PV_{CFD}$$

where

V_l	=	Value of leveraged firm
PV_{ITS}	=	PV of income tax shield
PV_{CFD}	=	present value of financial distress costs

The value of the firm relative to the level of financial gearing and in the presence of taxes and financial distress costs is illustrated in Figure 5.3.

Figure 5.3: Value of firm relative to financial gearing, with taxes and financial distress costs



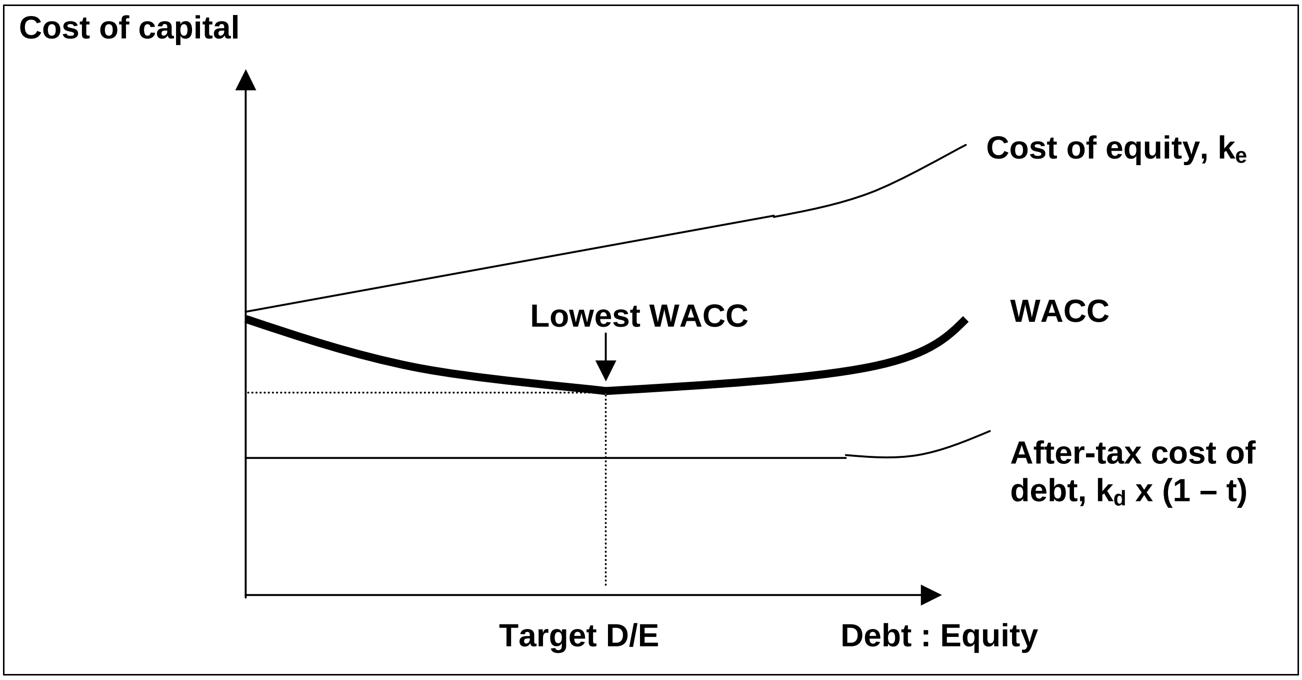
Source: Hawawini and Viallet (1999:361)

Figure 5.3 shows that the value of the firm as a whole can be increased by using higher levels of borrowings, up to a point where the benefits of gearing are offset by the disadvantages of financial distress.

Taking into account the tax benefits of debt financing on the one hand and financial distress costs on the other, one can conclude that the value of the firm is at its highest when the WACC is at its lowest. This level of financial gearing represents the optimal capital structure. This model of debt financing is known as the trade-off model of capital structure (Hawawini & Viallet 1999:362).

The cost of capital relative to the level of debt, incorporating tax and financial distress, is illustrated in Figure 5.4.

Figure 5.4: WACC for different levels of financial gearing, with taxes and financial distress costs



Source: Hawawini and Viallet (1999:362)

From the graph in Figure 5.4, it is evident that using more debt causes the WACC to decrease to a certain point (target ratio), until it starts to increase again because of the effects of financial distress. The dynamic nature of the inputs in determining the WACC must be recognized. So, for instance, the values of interest rates and tax rates change over time, and this in turn changes the WACC. It is therefore possibly more important to know in what interval of financial gearing the optimal level occurs than to know the exact level of gearing that would give the lowest WACC.

5.3.2.4 Factors affecting the capital structure decision

The factors that affect decisions about the level of financial gearing are, according to Hawawini and Viallet (1999:374), the following:

Factors in favour of borrowing:

- Income tax – the tax deduction allowed on interest payments means that the effective cost of debt is the after-tax cost of debt.
- Debt reduces the agency costs of equity – the servicing of the debt disciplines managers not to waste shareholders' funds.
- Debt allows owners to retain control of the company, because it is a means of raising finance without issuing more shares.
- Debt may prevent a possible drop in the share price when shares are issued (if outside shareholders think managers only issue shares when the share price is overvalued).

Factors against excessive borrowing:

- Financial distress costs – companies with high debt experience more financial distress.
- Agency costs of debt – lenders make borrowing agreements stricter to protect themselves against managers that do not manage debt well.
- Difficulty in maintaining a dividend policy – a huge debt burden may make it very difficult for a company to keep paying a steady, or increasing dividend.

- Loss of financial flexibility – large debt obligations may hinder a company in using value-creating investment opportunities.

Designing the right capital structure is more an art than just the application of the correct formula. There is a framework and there are some guidelines, but the process requires insight, good timing and, above all, sound judgment.

5.3.3 Component cost of equity

The cost of equity is indicated as k_e. It can be calculated or estimated using three different approaches. These approaches are:

- the dividend discount model;
- the capital asset pricing model (CAPM); and
- the arbitrage pricing model (APM).

The three approaches are discussed below.

5.3.3.1 Dividend discount model

The dividend discount model is based on the assumption that ordinary shareholders only have a residual claim against the company, once obligations (including interest and repayments of loans) have been met. Consequently, shareholders value their shares based on their expectation of future dividends, as well as their required rate of return.

According to the dividend discount model, the value of an ordinary share is equal to the present value of all the expected future cash dividends to be received. The model can be expressed as follows:

$$P_0 = D_1 / (1+ k_e)^1 + D_2 / (1+ k_e)^2 + \ldots\ldots D_t / (1+ k_e)^t + \ldots\ldots$$

where

D_1 = dividends in period 1

D_t = dividends in period t

k_e = required return from this share

If the market is in equilibrium and the shares appropriately priced according to the required risk, then the price, P_0, can be inserted in the formula in order to calculate the required return, k_e. The required return is also the cost of the equity capital.

The formula above presents a problem, in that it is impossible to forecast all future dividends. This difficulty can be overcome by making an assumption about the future growth in dividends. If the future growth in dividends is expected to remain constant, and it is indicated by the symbol "g", the so-called Gordon Constant Growth Model formula can be used. It is stated as follows:

$$P_0 = D_1 / (k_e - g)$$

This formula can be rearranged as follows:

$$k_e = D_1 / P_0 + g$$

When expressed like this, it is clear that the cost of equity, k_e, is a function of the next year's dividend, the current ex-dividend price per share and the future expected constant growth rate in dividends, g.

So, for example, assume that the current ex dividends share price of one ordinary share in a company is R40. The expected dividend at the end of the next year is R2 per share and the expected future constant growth rate in dividends is 15%.

The formula can be applied as follows:

$$\begin{aligned} k_e &= R2 / R40 + 15\% \\ &= 5\% + 15\% \end{aligned}$$

= 20%

From the calculation of k_e above, it is clear that the cost of equity consists of two components. The first is the expected dividend yield, as expressed by D_1 / P_0, and the second is the expected constant future growth rate, g.

The dividend discount model, however, has very limited application due to the underlying assumptions. While it is impossible to estimate future dividends for an indefinite period, it is also totally impractical to expect that dividends will remain constant (no growth) or that dividends will grow at a constant rate.

Further problems are encountered if it is assumed that there are no dividends and if the expected future growth rate exceeds the cost of equity. All these problems have led to the formulation of other models (discussed below) to determine a more reliable cost of equity. The first of these, namely the CAPM, is discussed below.

5.3.3.2 Capital asset pricing model (CAPM)

The CAPM was developed using the assumption that shareholders can only expect to be compensated for risk, which cannot be diversified away. This risk is called systematic risk. Oost (1988:5.13) and several others have expressed total risk as follows:

Total risk = Systematic risk + Unsystematic risk
= Non-diversifiable risk + Diversifiable risk

An investor is able to hedge against company-specific risk (also called unsystematic risk and diversifiable risk) by holding a portfolio of shares instead of investing in one kind of share alone. Consequently, shareholders can only expect to be compensated for systematic risk and the rate of return they require should only reflect this kind of risk.

The portfolio effect of diversification on the risk of a portfolio of shares is illustrated in Figure 5.5.

Figure 5.5: Portfolio effect of diversification

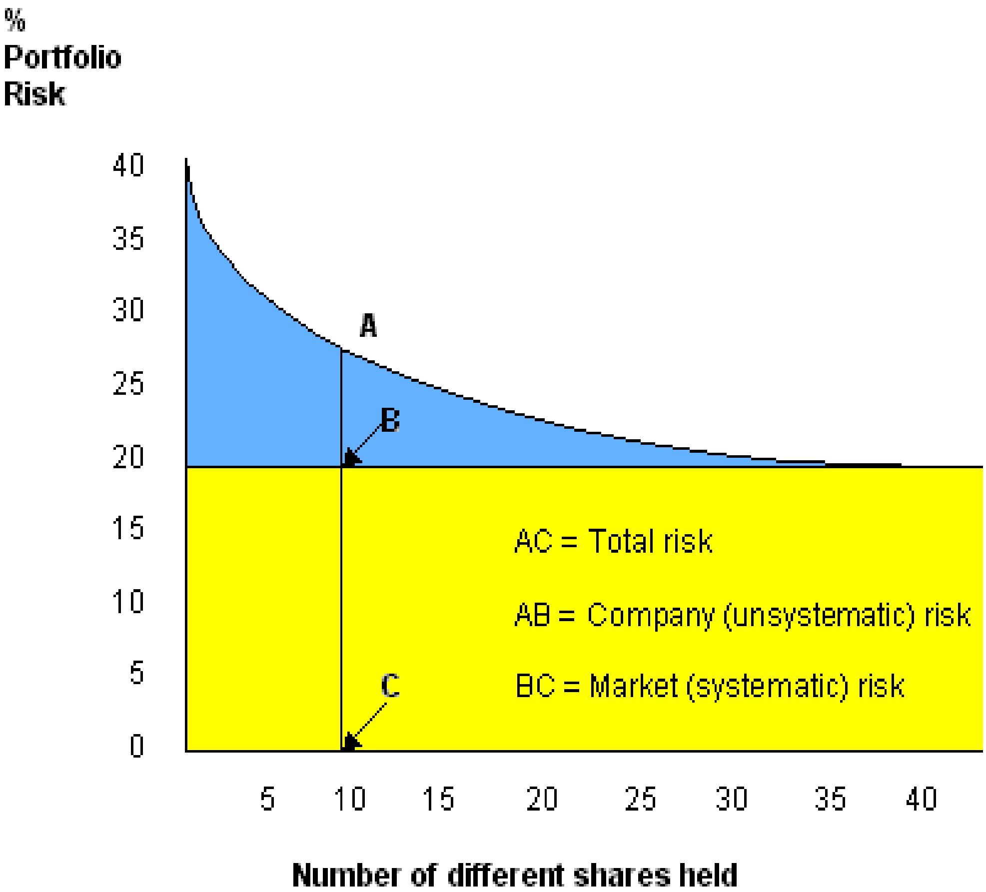


Figure 5.5 shows that increasing the number of shares in the portfolio decreases the portfolio risk, as indicated by the standard deviation of returns. However, increasing the number of shares only eliminates the company-specific risk (unsystematic risk) and not the systematic risk. Shareholders holding a fully diversified portfolio of shares expect (or require) compensation for the risk they cannot diversify away, namely systematic risk.

The CAPM calculates the cost of equity by starting off with the so-called risk-free rate and then adds a premium for systematic risk.

The CAPM formula is the following:

$$k_e = R_f + ß(R_m – R_f)$$

where

R_f = Risk-free rate

$ß$ = beta-factor

R_m = Market rate of return

The risk-free rate can be estimated by using the rate for government bonds for an appropriate maturity date. The beta-factor is a measure of systematic risk. It is determined for a specific company or for an industry by using the statistical method of least squares and by calculating the regression. The returns of the company (or industry) are taken as the dependent variable, y, and the returns of the market as the independent variable, x.

The beta-factor is therefore a measure of the volatility of the returns of the company shares, relative to the returns of the market. The calculation of the cost of equity by using the CAPM and the beta-factor is described by many academic sources, including Beneda and Colson (2003:66).

If the returns of a given company move in harmony with the market and show exactly the same volatility as the returns of the market, the beta-factor is 1. The beta-factor is greater than 1 if the returns of the company are more volatile than those of the market. If, on the other hand, the returns of the company are less volatile than those of the market, the beta-factor is less than 1.

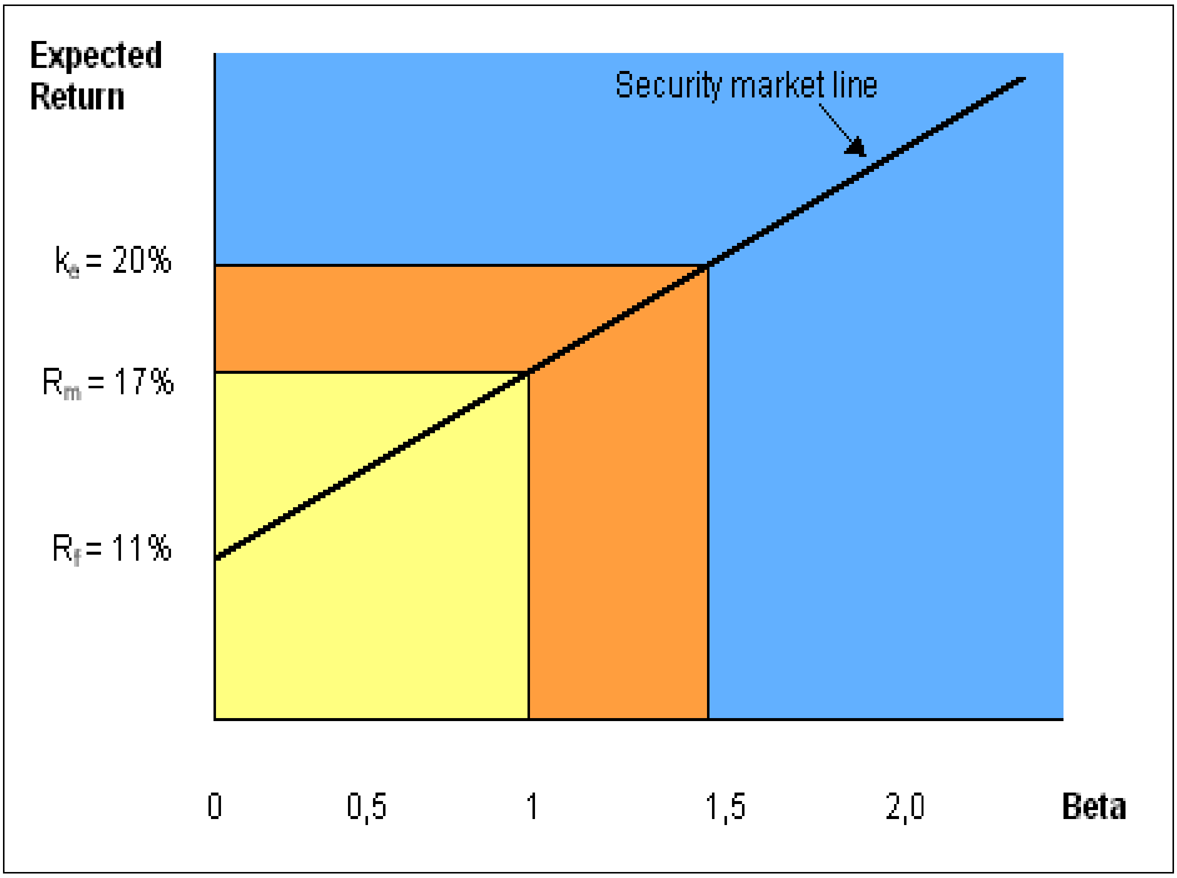
The market return is the average return of the market as a whole, which is normally the return of the securities exchange on which the shares are traded. The average returns of the sector in which the company operates can also be used as a proxy for the market as a whole. The market return minus the risk-free rate is the so-called market premium. The market premium multiplied by the beta-factor is added to the risk-free rate to determine the cost of equity.

So, for example, Company X has a beta-factor of 1,5 and the risk-free rate is 11%, while the market return is 17%. The cost of equity can then be determined as follows:

$$
\begin{aligned}
k_e &= R_f + ß\,(R_m – R_f) \\
&= 11\% + 1,5\,(17\% - 11\%) \\
&= 20\%
\end{aligned}
$$

The graph in Figure 5.6 uses the information from the example above. It shows how the risk-free rate, the beta-factor and the market premium are used to determine the cost of equity.

Figure 5.6: Beta and the security market line



From Figure 5.6 it is clear that, if the beta-factor is equal to 1, the cost of equity is the same as the market return (17%). If the beta is equal to 1,5, the cost of equity is 20%. If one uses a different beta-factor, the cost of equity changes according to the CAPM formula. In this way, the cost of equity can be determined for any beta-factor by moving along the so-called security market line, as indicated in Figure 5.6. The security market line shows the relationship between systematic risk as indicated by the beta, and the required return based on that risk.

The CAPM has been criticised by many researchers over a number of years, most notably by Fama and French (1992:464). They assert that their findings did not support the most basic assumption of the CAPM model, namely that average share returns are positively related to market betas. In the conclusion to their article, they comment: "We were forced to conclude that the SLB model (CAPM model) does not describe the last 50 years of average stock returns."

In spite of such criticism, the CAPM is still widely used to determine the cost of equity. Pettit (1999:113) confirms the popularity and robustness of the CAPM: "While there have been challenges to the CAPM, it remains the most practical approach available to determine the cost of equity. In fact, the perceived limitations of the model arise in large part from *applying* the model."

The application problems of the CAPM referred to by Pettit (1999:113) centre on the difficulty of estimating the market premium and measuring the beta. In his article, he suggests ways in which the risk premium can be estimated more accurately by using a truly risk-less rate, as opposed to a risk-free rate. Pettit (1999:118) has also suggested ways in which the calculation of the beta-factor can be adjusted to obtain a more reliable value.

In an attempt to overcome the limitations of the CAPM, the arbitrage pricing theory (APT) was developed, incorporating a range of factors that affect systematic risk. The APT is discussed below.

5.3.3.3 Arbitrage pricing theory (APT) model

The APT model was developed using the same principles that underlie the CAPM. However, instead of using one factor of risk, it uses a multifactor approach. The basic assumption of the APT is that competitive forces quickly eliminate arbitrage opportunities. It means that investors cannot earn a positive expected rate of return on any combination of assets without incurring some risk and without making some net investment (Berry, Burmeister and McElroy 1988:30).

According to Copeland *et al*. (1996:274), the definition of the cost of equity, using the APT, can be expressed as follows:

$$k_S \quad = \quad r_f + [\ E(F_1) - r_f]\ beta_1 + [\ E(F_2) - r_f]\ beta_2 + \ldots + [\ E(F_k) - r_f]\ beta_k$$

where

k_S	=	cost of equity
r_f	=	the risk-free rate
$E(F_k)$	=	the expected rate of return on a portfolio that mimics the k^{th} factor and is independent of all others
$beta_k$	=	the sensitivity of the stock return to the k^{th} factor

The APT uses different factors that influence the sensitivity of the share returns instead of only one factor as used by the CAPM. The five most important fundamental factors that have been identified in empirical research findings in the USA are changes in

- the industrial production index (a measure of how well the economy is doing in terms of actual physical output);
- the short-term real rate (measured by the difference between the yield on treasury bills and the Consumer Price Index);
- short-term inflation (measured by unexpected changes in the Consumer Price Index);
- long-term inflation (measured by the difference between the yield to maturity on long-and short-term USA government bonds); and
- default risk (measured by the difference between the yield to maturity on Aaa- and Baa-rated long-term corporate bonds).

The empirical evidence cited by Copeland *et al*. (1996:275) indicates that there are significant differences between the cost of equity calculated using the APM and the cost of equity calculated using the CAPM. It also shows that the APM explains expected returns better than the CAPM does. Another advantage of the

APT is that it provides more insight into the risks involved in investment in a specific share or industry. However, the application of the APT is even more difficult than that of the CAPM, because five factors for systematic risk need to be estimated when using the APT, instead of only one when using the CAPM.

The discussion above analyses the three models that can be used to determine the cost of equity, namely the dividend discount model, the CAPM and the APT. Taking into account all the available empirical evidence regarding the pros and cons of each model, one can conclude that the CAPM is still preferred as the most practical method to determine the cost of equity.

5.3.4 The component cost of preference share capital

The holders of preference shares are entitled to their preference dividends before any ordinary dividends are paid to ordinary shareholders. This legal requirement is entrenched in the South African company law, which stipulates that preference shareholders have the same voting rights as ordinary shareholders when preference dividends are in arrears.

Preference dividends are based on the nominal value of preference shares. Unlike interest payments, preference dividends are not tax-deductible. The value of preference shares depends on the percentage of preference dividends paid on the nominal value of the preference shares and that paid on current market rates.

If a preference dividend of 12% is paid on preference shares with a nominal value of R100 each and the current market rate on similar preference shares is also 12%, then the value of the preference shares is also R100. The cost of the preference capital is 12%.

If, for the same example, the current market rates on similar preference shares go up to 15%, the preference dividend received of R12 per preference share, discounted at a required rate of 15%, is calculated as follows:

Value of preference share = Preference dividend / Required rate
= R12 / 15%
= R80

The cost of the preference capital to the company is always the current market rates (assuming there are no flotation costs). This is so because if the issuing company only pays a preference dividend of 12%, it is only able to sell the preference shares at a market price of R80 per share when the market rate is 15%. Therefore the component cost of the preference share capital is calculated as follows:

Cost of preference share capital k_p = Current dividend / value per preference share
= R12 / R80
= 15%

If there are any flotation costs in the issue of new preference shares, the net amount to be received on the issue of the preference shares, namely the market value minus the flotation cost, is used to determine the cost of the preference share capital. Correia *et al*. (2003:6-7) suggest the following formula:

$$K_p = D_p / [V_p (1 – F)]$$

where

K_p = component cost of preference share capital
D_p = current preference dividend per share
V_p = current market value per preference share
F = flotation cost as a % of market value per preference share

So, for example, using the same information as in the previous example and adding the element of a flotation cost of 5% per share (R80 x 5% = R4 per share), the component cost of a new issue of preference shares is calculated as follows:

$$K_p = D_p / [V_p (1 - F)]$$
$$= R12 / [R80 (1 - 0{,}05)]$$
$$= R12 / R76$$
$$= 15{,}79\%$$

5.3.5 The component cost of debt

The component cost of debt is determined in a manner similar to that used for preference shares. The long-term debt can take the form of term loans, which pay a negotiated interest rate, or debentures, which have a coupon rate. Whatever the form in which the debt is issued, the effective interest rate would have to be in line with the current market rate.

If a loan for an amount of R1 million (unlimited duration) was originally acquired at 10% and the current market interest rate on similar loans is 12%, the market value of the loan drops to R833 333. This is calculated as follows:

Market value of debt = interest paid / current interest rate

= 10% R1m / 12%
= R100 000 / 0,12
= R833 333

If the company wants to take out a loan for the same amount and with similar risks, it has to pay interest at the market rate of 12%. If the company wants to raise the amount by way of a bond issue and it still wants to pay 10% interest, the issue has to take place at a discount, so that the effective rate that the investor receives is the market rate of 12%.

For a company that does not have assessed losses for tax purposes, the interest paid is tax-deductible. Therefore the actual effective cost of debt is the after-tax cost, after taking into account the tax benefit derived from the fact that the interest can be deducted in the calculation of the income tax payable. This can be expressed as follows:

$$K_d = I\,(1 - t)$$

where

K_d = the cost of debt

I = the interest rate payable

t = the marginal tax rate

So, for example, if the current interest rate on new debentures is 15% and the tax rate is 30%, the after-tax cost of debt is determined as follows:

$$\begin{aligned} K_d &= I\,(1 - t) \\ &= 15\%\,(1 - 0{,}3) \\ &= 10{,}5\% \end{aligned}$$

If there are issue costs involved in the issue of new debt, the net amount raised by the issue is lower and the effective cost of the debt is higher. Using the information from the example above, a coupon rate on the debentures of 12% and issue costs amounting to 5%, the cost of debt can be calculated as follows:

$$\begin{aligned} \text{Value of debenture} &= (\text{coupon rate / required rate}) \times \text{nominal value} \\ &= (12\% / 15\%) \times R100 \\ &= R80 \end{aligned}$$

After subtracting the issue costs, the net amount received per debenture is the following:

$$\begin{aligned} \text{Net receipt} &= V_d\,(1 - F) \\ &= R80\,(1 - 0{,}05) \\ &= R76 \end{aligned}$$

The interest cost before tax is R12 / R76, which is 15,79%. The after-tax cost of debt can now be determined as follows:

$$K_d = I\,(1 - t)$$
$$= 15{,}79\%\,(1 - 0{,}3)$$
$$= 11{,}05\%$$

Using the weights and components costs determined in the examples given above, the WACC can now be calculated as follows:

$$\text{WACC} = w_1k_e + w_2k_p + w_3k_d$$

It would be unwise to generalize expectations of benchmarks for WACC, because companies differ in respect of the industries they operate in and also with regard to their sensitivity to risk. Pettit (1999:120) comments: "Based on the current 30-year government bond rate of about 5,5%, our study implies an expected long-run return on U.S. equities of about 10,5%." This means that the average WACC of the shares included in his study was probably lower than 10,5%, because of the lower component cost of preferred capital and debt.

As far as the average WACC of South African companies is concerned, Eedes (2002:1) remarks: "A weighted average cost of equity and debt is taken to determine the overall cost of capital. This year [year ended 30 June 2002] the average cost of capital of SA's 200 largest companies excluding banks and other financial institutions was 15,75%, down from 17,7% last year." The higher local average WACC (compared to that of American companies) is to be expected because of the higher inflation rate and the number of risk factors in South Africa.

In this section, an attempt was made to illustrate how WACC is determined by the component cost of each source of long-term capital, as well as the weight of each source of capital. The weights to be used are determined by the optimal (target) capital structure of the company concerned.

5.4 THE PERFORMANCE SPREAD

The performance spread is a percentage differential that indicates internal value-creation (if it is positive) and value-destruction (if it is negative). It measures whether the after-tax return (before interest) earned by the company is more than its WACC and is determined as follows:

Performance spread = ROIC – WACC

Using the ROIC calculated in the example in Section 5.2 and an assumed WACC of 18,45%, the calculation of the performance spread can be calculated as follows:

Performance spread	=	ROIC - WACC
	=	40,00% - 18,45%
	=	21,55%

The positive return spread of 21,55% means that the hypothetical company used in the example was able to generate returns higher than its cost of capital. Therefore it created value for its shareholders. The extent of the value created in terms of EVA depends on the capital invested. Once the amount of IC has been determined, the EVA can be calculated.

5.5 IC

The IC consists of all the assets employed by a company, irrespective of the nature of the assets, or how the assets have been financed. Stewart (1991:70) describes capital as follows: ”Capital is a measure of all the cash that has been deposited into a company over its life without regard to its financing source, accounting name, or business purpose, much as if the company were just a savings account.”

Therefore all the assets of a company are seen as cash invested in the company. The question is not whether the assets are fixed assets or current working capital or even how the company was financed, but indeed how effectively the capital was used. The accounting values of the net assets of a company are adjusted in order to reflect the following three basic requirements:

- to convert from accrual to cash accounting (based only on actual receipts and payments);

- to convert from the liquidating perspective of lenders to the going-concern perspective of investors; and

- to convert from successful efforts to full-cost accounting.

The adjustments that are needed to the amount of net assets and operating profits in order to implement the above-mentioned requirements have been described in more detail in Chapter 3 and need not be repeated here.

From an operating perspective, the IC is the sum of the book value of the fixed assets plus the value of the company's net working capital and cash (if any). From a financial point of view, this amount of total net assets is also equal to the sum of the amounts of long-term finance used to finance the net assets. The long-term sources of funds used most often are equity and debt.

The operational perspective and the financing perspective tend to be equivalent, because changes in the amount of assets invested are also reflected in changes in the total amount of equity and debt. The following sequence of events would shed some light on this equivalence:

- As a first step [see (1) in Figure 5.7], a company raises capital using a mix of equity and debt. The capital is then invested in fixed assets and net working capital [see (2) in Figure 5.7].

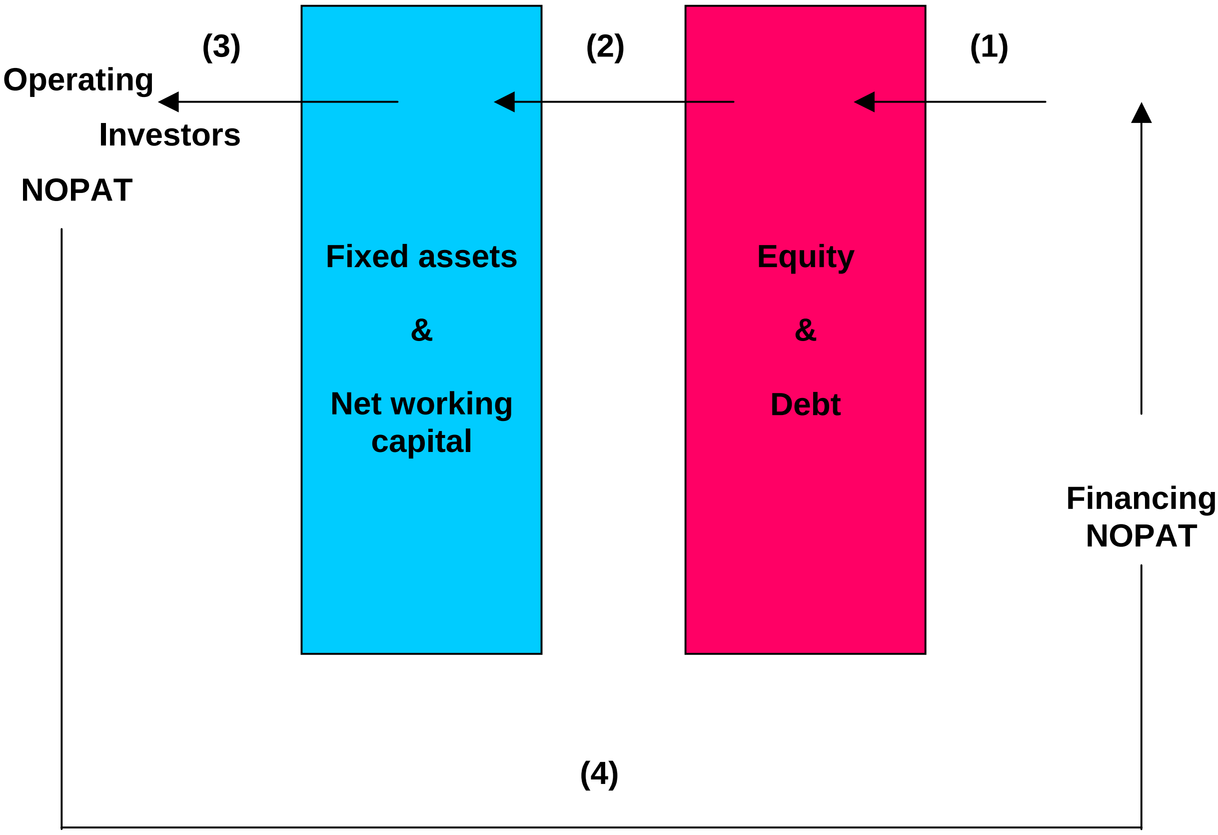
- Next, the business generates sales and incurs expenses, which leads to operating profits after tax (NOPAT). This step is indicated as (3) in Figure 5.7.

- These operating profits, in turn, constitute a pool of cash, which is available to the firm [see (4) in Figure 5.7].

- This pool of cash is paid out firstly to the suppliers of debt and preference share capital and then to ordinary shareholders. The remaining cash (retained income) becomes part of reserves to be re-invested in the business.

The practical implication of this equivalence is that the IC can be determined by using fixed assets plus net working capital (the operational approach), or by using equity plus long-term debt (a financing approach). The four steps explaining the equivalence of the operating perspective and the financing perspective are set out in Figure 5.7.

Figure 5.7: Four steps tying the operating perspective to a financial perspective



Source: Stewart (1991:94)

In determining the amount of invested capital, it is helpful to use the accounting balance sheet and to summarize and transform it into a managerial balance sheet. This process is illustrated by means of the following example:

The following accounting balance sheet is available for a company (the information is an expansion of the information given in Section 5.3.1:

Balance sheet on 30 June 2002		**R million**
Non-current assets		75
Land and buildings	25	
Plant and equipment (book value)	35	
Vehicles (book value)	15	
Current assets		45
Inventory	12	
Debtors	28	
Cash in bank	5	
		120
Equity and liabilities		
Ordinary share capital		30
Share premium		10
Reserves		20
Equity		60
Preference share capital (12% p.a.)		10
Long-term loan (15% interest p.a.)		30
Current liabilities		20
Creditors	13	
Other accruals	4	
Tax payable	3	
		120

The accounting balance sheet above can be summarized and presented as a managerial balance sheet. A managerial balance sheet is presented in such a way as to facilitate the determination of the IC, after making the necessary adjustments. The adjustments have already been dealt with in Chapter 3. The managerial balance sheet looks as follows:

Balance sheet on 30 June 2002	**R million**
Non-current assets	75
Net current assets (45 – 20)	25
	100
Ordinary share capital and reserves (equity)	60
Preference share capital (12% p.a.)	10
Long-term loan (15% interest p.a.)	30
	100

From an operational perspective, the IC is the sum of the non-current assets and the net current assets and it is calculated as follows:

IC	=	Non-current assets + net current assets
	=	75 + 25
	=	R100 million

From a financing perspective, the IC can be determined by adding all the long-term sources of finance, as follows:

IC	=	Book value of (equity + pref. share capital + debt)
	=	60 + 10 + 30
	=	R100 million

All the components of the formula for EVA have now been discussed and calculated for a hypothetical company. The final calculation can now be done, using the formula for EVA and all the values determined for its different components. The value of the EVA for the year ended on 30 June 2003 is calculated as follows:

EVA	=	Performance Spread x IC
	=	(ROIC – WACC) x IC
	=	(40% - 18,45%) x R100 million

= 21,55% x R100 million

= R21,55 million

The positive amount of EVA of R21,55 million indicates that internal value has been created by the company for shareholders, over and above the cost of capital. This value is recalculated for each period (typically a financial year) and has a direct bearing on the external value of the company.

The MVA is theoretically equal to the present value of all future EVAs. If the current EVA is a good indication of what future EVAs will be, the MVA would be a multiple of the current EVA. This multiple would depend on whether the company has a positive EVA and on the WACC, as well as on the growth expectations with regard to the future EVA.

5.6 CONCLUSION

The EVA of a company consists of different components, which must be calculated separately in order to calculate the value of the EVA. These components are:

- the ROIC;
- the WACC;
- the performance spread; and
- the IC.

Each component has been discussed in this chapter, with an example to illustrate the calculation needed to determine the value of the component.

It has been shown that the ROIC is determined by dividing the NOPAT by the IC and that the ROIC is a measure of the operating returns generated by the company. In determining the WACC, the optimal capital structure of the company determines the weighting to be used in the calculation of the WACC. Research by

Hall (1998:199) on listed South African companies indicates that a company's WACC makes a sizable contribution in the determination of EVA.

After the appropriate weights have been determined according to the market value of each of the main sources of capital, one can proceed to determine the component cost of each source of capital. The main long-term sources of capital are equity and debt, and perhaps preference share capital.

The component cost of equity is the most difficult variable to estimate. In this chapter, it has been shown how either one of three methods, namely the dividend discount model, the CAPM and the APT can be used to calculate the cost of equity. The CAPM is still preferred as the most practical approach to determine the cost of equity, in spite of a lot of criticism of this model over the last few years.

With regard to the determination of the component cost of preference share capital, it has been shown that the current preference dividend percentage approximates the real cost of preference capital, even if the actual rate differs from the current rate. This is so because the value of the preference shares is adjusted according to changes in the current preference dividend rates, so that new investors effectively receive the current rate.

In this chapter, it has also been shown how the flotation costs (issue costs) of new issues of preference shares can be incorporated in the calculation of the component cost. The effect of flotation costs would be to increase the component cost of preference shares, because the amount raised is smaller.

As far as the component cost of debt is concerned, the calculation is very similar to that for preference shares, with the difference that the interest paid on debt is tax-deductible. Therefore the effective component cost of debt is the after-tax cost (taking into account that the Receiver of Revenue subsidizes a part of the interest expense). The amount of the subsidy is the interest expense multiplied by the tax percentage, and it is only available to companies that have enough taxable income against which the deduction can be claimed.

The determination of the WACC was illustrated using the weightings and the component cost for each source of capital. As a next step, the performance spread could be determined by subtracting the WACC from the ROIC. The IC was determined after transforming the accounting balance sheet into a managerial balance sheet.

Finally, the chapter illustrated how the EVA is determined by multiplying the performance spread (a percentage differential) by the IC. The discussion concluded with an illustration of the multiplying effect of the EVA on the MVA of companies with positive EVAs. In the next chapter there is a discussion of the evaluation of companies according to value creation and cash management, followed by the placement of companies on a financial strategy matrix.

CHAPTER 6

GROWTH IN SALES AND VALUE CREATION IN TERMS OF THE FINANCIAL STRATEGY MATRIX

6.1 INTRODUCTION

It is very important for all companies to manage growth. It is possible for a company to grow without adding value, and the quality of the growth, or lack of it, is revealed by the calculation of the EVA for that particular company. A positive EVA (or NPV) for an expansion project indicates that the growth in assets and sales in terms of that project will add value after taking into account the full cost of capital. This issue has been dealt with in detail in previous chapters.

Another aspect of growth that is vital to an organization is the pace at which it grows. As long as a company has easy access to additional shareholders' funds or borrowed funds, it can increase its assets (and therefore also its sales) almost as rapidly as it likes, provided the demand is large enough. If the company does not want to raise new shareholders' funds to finance growth, it can use internally generated funds plus an amount of borrowings (limited by the target capital structure).

Managers are often reluctant to issue new shares for a number of reasons. The most important reasons are the possibility of a loss of control when new shareholders take up shares, and the fact that new issues are expensive due to flotation costs. Consequently, it is preferable to finance growth from retained income as well as an appropriate amount of debt, in order for the target capital structure to remain the same.

Hawawini and Viallet (1999:506) define the sustainable growth rate of a company as follows: "The self-sustainable growth rate is the maximum rate of growth in sales a business can achieve *without* changing its financing policy (same debt-to-equity ratio, same dividend payout ratio, and no new issue of equity or share repurchase) or modifying its operating policy (same operating profit margin and same capital turnover)."

In this chapter it is shown that the rate at which a company can (consistently) grow its sales is determined by its financial performance and its financial policies. The discussion shows that growing sales at a rate faster than the SGR could cause cash shortfalls and that sales growth at a lower rate than the SGR could lead to cash surpluses.

The discussion on sales growth is followed by the introduction of the financial strategy matrix as a financial tool, incorporating both value management and growth management (sales growth relative to the SGR percentage).

6.2 FINANCING REQUIRED FOR SALES GROWTH

It is a well-known axiom that it takes money to make money. This means that in order to increase sales, a company also needs to increase its fixed assets, debtors and inventory to produce and support the additional sales. There obviously also needs to be a spontaneous increase in trade creditors to provide the additional short-term finance needed. Consequently, additional finance is needed to finance extra fixed assets, plus extra net working capital. The total amount of net assets (referred to above) is also described as the "total net assets".

Many inexperienced and overly optimistic entrepreneurs have found that companies can actually "grow them to death" by increasing their sales too rapidly.

If sales grow too quickly, there is not enough spontaneous finance from retained income and debt (to maintain the target financial gearing ratio) to finance additional fixed assets and to supply the net working capital needed. This causes a cash shortfall that accumulates rapidly if the growth in sales is not limited to a sustainable level.

Cash shortfalls can be overcome by extra borrowings (which may weaken the financial structure) and/or by new issues of shares (new issues of shares are expensive and may have unwanted control implications). These remedies could provide temporary solutions, but they are not sustainable in the long term.

The SGR is a measure that financial institutions use for different purposes, such as to evaluate the creditworthiness of companies. If the actual growth rate in the sales of a company is greater than the SGR, financial institutions are prepared to advance loans to the company or to assist in the issue of shares in order to provide the capital needed. If the actual growth rate of sales is consistently lower than the SGR, the cumulative cash surpluses would need to be invested and the financial institution may offer investment products to the company.

6.3 SGR

Zakon, of the Boston Consulting Group, developed the SGR. The SGR is also referred to as Zakon's formula (Correia *et al*. 2003:6-14). The SGR formula is the following:

$$SGR = D/E\,(R - i)\,p + Rp$$

where

D	=	debt
E	=	equity
R	=	percentage return on assets after tax
i	=	percentage interest on debt after tax
p	=	proportion of earnings retained

When one analyses the components of the formula, it is clear that the SGR is determined in terms of a company's profitability, as well as its financial policies regarding financial gearing and dividends. The formula was derived as illustrated below, in a simple example, which is then expanded.

6.3.1 SGR with no debt and no dividends

The growth rate that a company can sustain when it has no debt and does not pay any dividends can best be described by using an example.

So, for example, assume a company has total net assets of R100 million at the beginning of the year and a rate of return of 30% on the assets before tax. The tax rate is 30%, therefore the earnings before interest, after tax (EBIAT) is 21%.

As there is no dividend payment, the retained income is R21 million and the total net assets at the end of the year amount to R121 million. The amount of total net assets at the end of the year is 21% larger than the amount at the beginning of the year. This means that the bigger investment in assets can be used to generate 21% more in sales. Therefore the SGR is 21%.

The formula can be used to determine the SGR as follows:

$$
\begin{aligned}
SGR &= D/E\,(R - i)\,p + Rp \\
&= 0/100\,(21\% - 0\%) \times 1 + 21\% \times 1 \\
&= 0\% + 21\% \\
&= 21\%
\end{aligned}
$$

The answer shows that if there is no debt and there are no dividends, the SGR is equal to the after-tax return on assets (the amount of assets at the beginning of the year).

6.3.2 SGR with no debt and some dividend payment

Using the same information as that used in the example in Section 6.3.1, one can investigate the effect of a dividend policy on the SGR. If all the after-tax earnings of R21 million were paid out as dividends, the retained earnings would be zero and the SGR would be zero as well.

If half of the profits are paid out as a dividend, the retained income is R10,5 million and the retention ratio, (p), is 0,5. The total net assets at the end of the year are R110,5 million, which is 10,5% higher than the amount at the beginning of the year. The bigger asset base therefore generates 10,5% more sales during the next year. The SGR in this case is 10,5%.

This example shows that the dividend policy plays an important role in the determination of the SGR. The smaller the portion of profits paid out as dividends (the dividend payout ratio), the higher the retention ratio and the higher the SGR.

6.3.3 SGR with debt and dividend payments

When a company uses borrowed capital, the SGR can be increased by means of the leverage effect on profits and the fact that some debt can be added to the retained income to maintain the target capital structure.

To illustrate this scenario, the same information is used as before. It is also assumed that 40% of the assets are financed by debt, with a 15% interest rate, and that the dividend payout ratio is 0,5. The financial position and results are the following:

	R million
Equity	60
Debt	40
Total assets – beginning of year	100
Earnings before interest and tax 30% x R100 million	30,0
Interest on debt 15% x R40 million	6,0
Earnings before tax	24,0
Tax 30% x R24 million	7,2
Earnings after tax	16,8
Dividends 50% x R16,8 million	8,4
Retained income	8,4

The amount of additional debt that can be added to maintain the target capital structure is calculated as follows:

Additional debt	=	Retained Income x Debt / Equity
	=	R8,4 million x 40 / 60
	=	R5,6 million

Therefore assets and sales can be increased by R14 million, (the retained income of R8,4 million plus the additional debt of R5,6 million). The SGR is therefore 14%.

The result of 14% shows that the company could increase its SGR (from 10,5% to 14% in this instance) by using more debt financing instead of equity. The main determinants of the SGR formula are discussed below.

6.3.4 Factors that determine the SGR

The SGR of any company is determined by the following four factors (Ross *et al*. 1996:94):

- profit margin (an increase in the profit margin increases the firm's ability to generate funds internally and thereby increases its sustainable growth);

- net asset turnover (an increase in the firm's net asset turnover increases the sales generated for each Rand in assets; this decreases the firm's need for assets as sales grow and thereby increases the SGR – notice that increasing the net asset turnover has the same effect as decreasing capital intensity);

- financial policy (an increase in the debt/equity ratio increases the firm's financial leverage; and since this makes additional debt financing available, it increases the SGR); and

- dividend policy (a decrease in the percentage of net profit after tax paid out as dividends increases the retention ratio, in turn increasing internally generated equity and thus increasing sustainable growth).

The SGR formula is a valuable planning tool because it emphasises the relationship between the four factors described above and the SGR. It is also clear that if a company does not want to issue shares or change its profitability, asset turnover, financial gearing or dividend policy, it has only one SGR.

The SGR formula can also be used to determine what a specific variable needs to be in order to attain a particular SGR. So, for instance, if the basic information from the last example in Section 6.3.3 is used and it is furthermore assumed that profitability will change so that the SGR increases to 18%, the required return on assets, (R), can be calculated.

The information can be inserted in the SGR formula. R can then be calculated as follows:

$$SGR = D/E\,(R - i)\,p + Rp$$

$$18\% = 40/60\,(R - 10{,}5\%) \times 0{,}5 + R \times 0{,}5$$

18%	=	0,33R – 3,5% + 0,5R
0,83R	=	21,5%
R	=	25,8%

The result from the example shows an SGR of 18% if the after-tax return on assets increases to 25,8%. This can be done by increasing the profitability relative to sales and/or increasing the asset turnover and/or decreasing the effective tax rate.

6.3.5 Short formula for SGR

The formula given for the SGR can be presented in a shorter version by multiplying the ROE by the retention ratio as follows:

SGR	=	ROE x p

Using the information in Section 6.3.3, the ROE can be calculated as follows:

ROE	=	Earnings after interest and tax / Equity at beginning of the year
	=	R16,8 million / R60 million
	=	28%
SGR	=	28% x 0,5
	=	14%

An even shorter version of the SGR formula uses the retained income and divides it by the equity, as follows:

SGR	=	Retained income / Equity
	=	R8,4 million / R60 million
	=	14%

The shorter versions of the SGR formula are valuable when an answer is required quickly and there is no need to highlight the main factors that play a role in the determination of the rate. These short formulae can also be used when there is not sufficient information available to allow the use of the longer formula. In the next section, it is shown how sales growth at rates above or below the SGR cause shortfalls or surpluses in cash.

6.4 SALES GROWTH RATES ABOVE AND BELOW THE SGR

Knowing the percentage of the SGR, and the main SGR determinants, is critically important to a company. The information in Section 6.3.3 and 6.3.5, with an SGR of 14%, allows the impact on cash flow of growing sales at different rates to be investigated. The different sales growth rates explored are

- equal to the SGR, which is 14%;
- above the SGR, say, at 17%; and
- at a rate below the SGR, say, at 11%.

Amounts in R millions

Actual growth rate in sales		11%	14%	17%
Additional assets required	(A)	11,0	14,0	17,0
Available financing resources:				
Retained Income		8,4	8,4	8,4
Additional debt		5,6	5,6	5,6
Total	(B)	14,0	14,0	14,0
Surplus / (shortfall) (A) – (B)		3,0	-	(3,0)

The example above shows that if the company grows more slowly than the SGR, there is a surplus of cash, which builds up cumulatively if this scenario continues.

If sales increase by 11%, and the SGR is 14%, there is a cash surplus of 3% of net total assets (or R3 million).

If a company wants to grow its sales at a rate higher than the SGR, there is a shortfall of cash, which also builds up continuously if that scenario is perpetuated. If sales increase by 17%, and the SGR is 14%, there is a cash shortfall of 3% of the net total assets (or R3 million).

6.5 VALUE CREATION AND GROWTH MANAGEMENT

In the preceding chapters, the importance of economic profits (particularly EVA) have been discussed, as well as the link between EVA and a company's external indicator of value creation, its MVA. Furthermore, the repercussions of growing sales and assets too quickly have been addressed in Section 6.4 of this chapter, along with the reasons why companies should try to grow sales at a rate close to the SGR in the long term.

In this section, the main thrust of what has been discussed above is combined in a "financial strategy matrix" which links an organization's ability to create value with its management of growth and cash. Hawawini and Viallet (1999:507) introduced the financial strategy matrix concept. It represents a diagnostic tool that can be used to evaluate and navigate through the financial progress of a company.

The financial strategy matrix set out in this chapter maps the current situation of a company or industry in terms of value creation and growth management by ranking and placing it in a certain quadrant on the matrix. Once this has been done, the matrix can be used to determine appropriate strategies to improve the situation of the company and to move it to a preferred quadrant, and ultimately, to the quadrant it would most like to occupy.

The return spread, a percentage differential, is the difference between the ROIC and the WACC and is used as the measure of value creation. A positive return spread indicates value creation, while a negative return spread indicates value destruction. As it is a relative measure and not an absolute measure, there is no need to standardize it.

Growth and cash management are measured by taking the difference between the SGR and the actual growth rate in sales. If this difference is positive (SGR > actual growth rate in sales), it indicates that there is a cumulative cash surplus. A negative difference (SGR < actual growth rate in sales) means that the company is accumulating cash deficits.

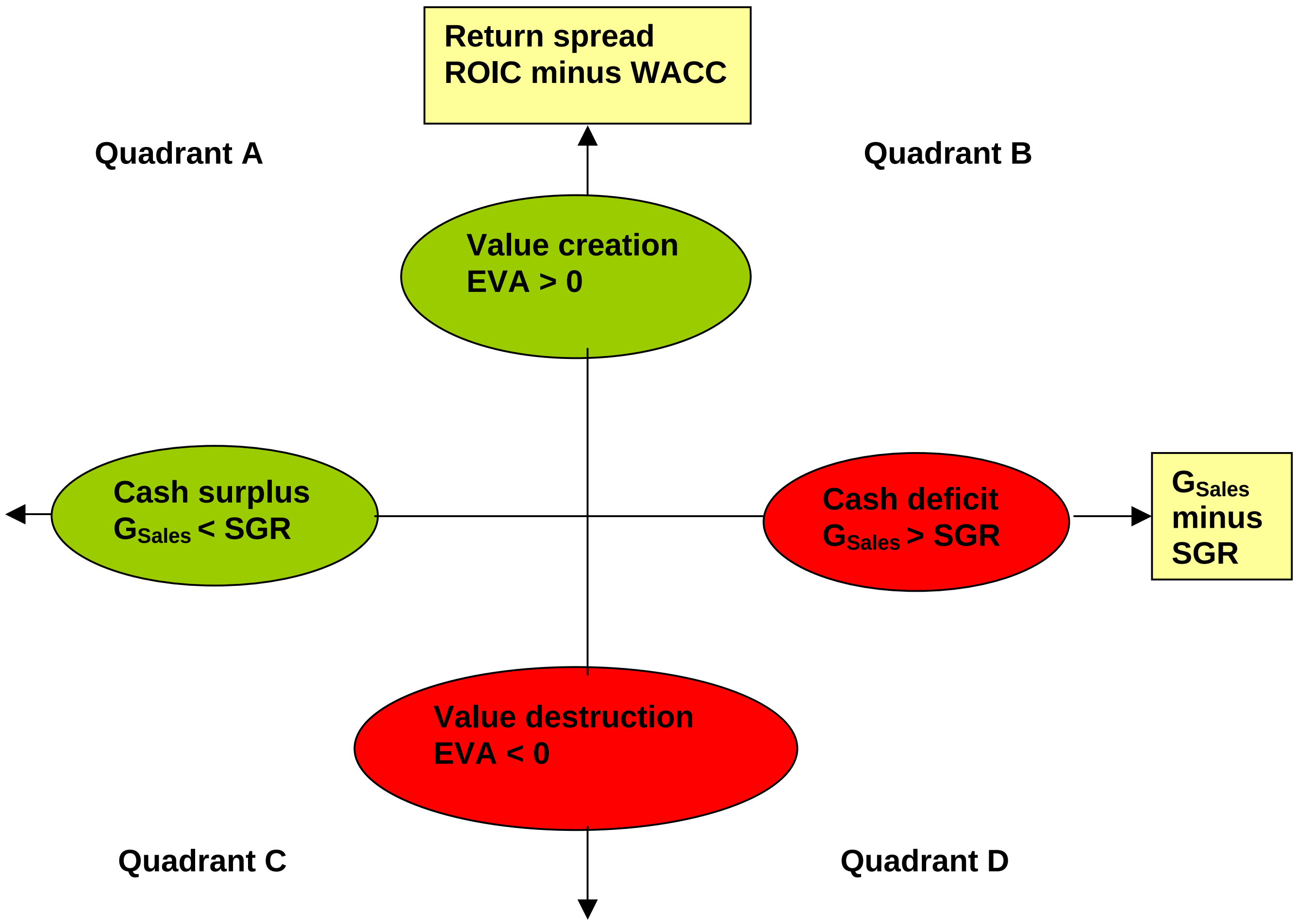
For a company with several departments or business units, it is possible to place each business unit or department on the financial strategy matrix in order to decide what course of action it should take in future. The strategic options open to a company or one of its businesses in one of the four possible quadrants is illustrated.

6.5.1 The financial strategy matrix

The financial strategy matrix introduced by Hawawini and Viallet (1999:507) indicates value creation (positive or negative) on the vertical axis. The measure used is the return spread (the ROIC minus the WACC). In order for comparisons between companies of different sizes to be made, the indicator of value needs to be measured relative to IC. The return spread is already a relative measure. In fact, standardizing the EVA by dividing it by the IC results in the return spread.

The pace at which a company grows, which may result in cash surpluses or cash deficits, is indicated on the horizontal axis. If the company grows too rapidly, its actual growth rate in sales is more than the SGR and the company will run up cash deficits. This situation would be reflected by a position to the right of the horizontal axis. If, on the other hand, the company's sales and assets are growing at a pace slower than the SGR, there is a build-up of cash surpluses and this situation is indicated by a position to the left of the horizontal axis. The financial strategy matrix is set out in Figure 6.1.

Figure 6.1: Financial strategy matrix



Source: Adapted from Hawawini and Viallet (1999:507)

6.5.1.1 Quadrant A: positive EVA and cumulative cash surpluses

This quadrant represents the best possible position to be in. Companies in this quadrant are adding value, as reflected by their positive EVA, and they are also not growing too quickly. They do not run up cash deficits. It is fairly obvious that these companies should strive to increase their EVA even more and should also try to make use of the cash surpluses building up each year.

The positive EVA of Quadrant A companies should result in a positive MVA for shareholders as well, unless the market believes that the current positive EVA will turn around and become negative in future. These companies can embark on specific strategies as discussed below.

The first priority of a company in this situation is to use its cash surplus to accelerate the growth of the business. This can be accomplished by expanding the company internally or by acquiring similar or related businesses. If there are no opportunities to grow internally or to negotiate appropriate acquisitions, the company may be tempted to opt for unrelated, diversifying acquisitions. Historically, it has been shown that this kind of unrelated acquisition rarely works. A company should rather avoid it, as a general rule.

If the surplus cash cannot be invested at a return that is higher than the cost of capital, the company has no choice but to return excess capital to shareholders. This provides shareholders with an opportunity to re-invest the funds in an investment of their choice. The surplus cash can be returned to the shareholders by means of a special dividend, or by means of a share buy-back scheme.

In short, the following strategic options are open to companies in Quadrant A:

- **Use cash surplus to grow faster.**
    - Make new investments (organic growth).
    - Acquire related businesses.
- **Distribute the cash surplus.**
    - Increase dividend payments.

- o Repurchase shares.

6.5.1.2 Quadrant B: positive EVA and cumulative cash deficits

Quadrant B companies do create value (as indicated by a positive EVA), but are growing too fast. They run up cash deficits. There are two obvious options in this situation. The first is to reduce or eliminate dividend payments if the company is paying a dividend. It would be easier for a company to cut the dividend paid to a parent company than the dividend paid to other shareholders.

The second obvious option is to inject new capital into the business by borrowing, or by issuing shares. Extra borrowing would place an additional debt burden on the company and increase the annual cash deficits. Furthermore, it would weaken the capital structure, so it is usually not a viable option. Equity capital is the only remaining alternative to raise the funds needed. It is easier to approach a parent/holding company to invest more capital in the business than to approach other shareholders.

If it is a listed company, new shares can be issued to the public, and a rights issue would be considered first, before an open invitation to take up shares is given. A rights issue ensures that the current shareholders have a choice in deciding about maintaining their percentage shareholding or allowing it to become diluted by not taking up their rights.

If there is a new issue of equity shares, there is also an opportunity to borrow funds to the extent of maintaining the capital structure of the company. If the debt-to-equity ratio is 6:4 and the new equity capital is R6 million, an additional amount of R4 million can be borrowed so that the capital structure remains the same.

If it is not possible to raise new capital, the company has no other choice but to cut back on some of its operations or to reduce the overall growth rate to the company's SGR. The products and services to be eliminated or scaled down would be those with the lowest profitability and the lowest capital turnover (the smallest EVA).

Such a cutback strategy may even enhance the value-creating capacity of remaining activities, because of the greater focus on a smaller market segment. However, there is some danger that competitors with cash surpluses could enter the market and put pressure on profit margins.

The options open to Quadrant B companies can be summarized as follows:

- **Cut dividends.**
- **Raise funds.**
  - Increase new equity.
  - Increase borrowing.
- **Reduce growth in sales to a sustainable level.**
  - Eliminate low margins and low capital turnover products.

6.5.1.3 Quadrant C: negative EVA and cumulative cash surpluses

Companies in this category are destroying value, but are also generating cash surpluses. Hawawini and Viallet (1999:508) suggest that these companies should alter their financial policies quickly, before the cash surplus runs out. They advise that part of the excess cash be returned to shareholders and that the rest of the cash be used to restructure the company in such a way that the returns on IC are increased to a level above the cost of capital.

As indicated earlier, ROIC can be increased by increasing either profitability relative to sales or the asset turnover. Profitability on sales can be improved by increasing volume and/or selling prices and/or by cutting operational expenditure. Asset turnover can be improved by more efficient use of fixed assets, but mostly by decreasing the investment in the net working capital. A decrease in the investment in debtors and inventory would be the most likely steps to be taken, and will have the greatest impact.

The return spread can also be improved by trying to decrease the WACC. This can be accomplished by changing the capital structure if it is not yet at an optimal level. Moving closer to the target debt ratio will have the effect of lowering the WACC. In this situation, it is vital that one should carefully discern whether further investment in the company is feasible or not. If there is little chance that the company can be turned around by the current management, the sale of the business to someone who can perhaps create value with it would be in order.

The strategic steps that can be taken by a Quadrant C company are the following:

- **Distribute part of the cash surplus and use the rest to improve profitability.**
  - Raise the efficiency with which assets are managed.
  - Increase the operating margin (higher volume, higher prices and tighter control over expenses).
- **Review capital structure policy.**
  - If the current capital structure is not optimal, modify the debt : equity ratio in order to lower the WACC.
- **If the above fails, sell the business.**

6.5.1.4 Quadrant D: negative EVA and cumulative cash deficits

A Quadrant D company destroys value and runs up cash deficits. This is the worst situation to be in and it requires immediate attention from and fast action by management. Drastic restructuring is probably required. Some of the assets of the business must be sold in order to raise cash immediately. Furthermore, the other operations have to be scaled down to change them into value-creating activities.

If there is little chance that the remaining operations can be turned around quickly, it would be better to sell the business (unit). Care should be taken not to use surplus cash funds generated by other successful business units to finance the remaining operations of the business unit(s) in trouble. Business units that are allowed to remain in this situation too long may affect the long-term survival of the company as a whole.

The only two options available for Quadrant D companies are the following:

- **Attempt drastic restructuring.**
- **Simply exit the business.**

6.5.2 Example of companies placed in each quadrant

In this section four hypothetical companies were analysed in terms of value creation and cash generation and then placed in the financial strategy matrix. The information about the companies was chosen in such a way that there is a company in each category or quadrant. The company in Quadrant A is A_1, with B_1 in Quadrant B, C_1 in Quadrant C and D_1 in Quadrant D.

The vertical axis of the financial strategy matrix has been calibrated in percentage points, where a positive return spread is indicated as a positive percentage differential towards the top of the vertical axis. A negative return spread is indicated as a negative percentage differential towards the bottom of the vertical axis.

On the horizontal axis, also calibrated in percentage points, the sales growth minus the SGR is shown as a percentage differential. If the actual sales growth rate is higher than the SGR, the differential is positive and it is indicated to the right of the horizontal axis. If the sales growth is smaller than the SGR, the differential is negative and it is indicated to the left of the horizontal axis.

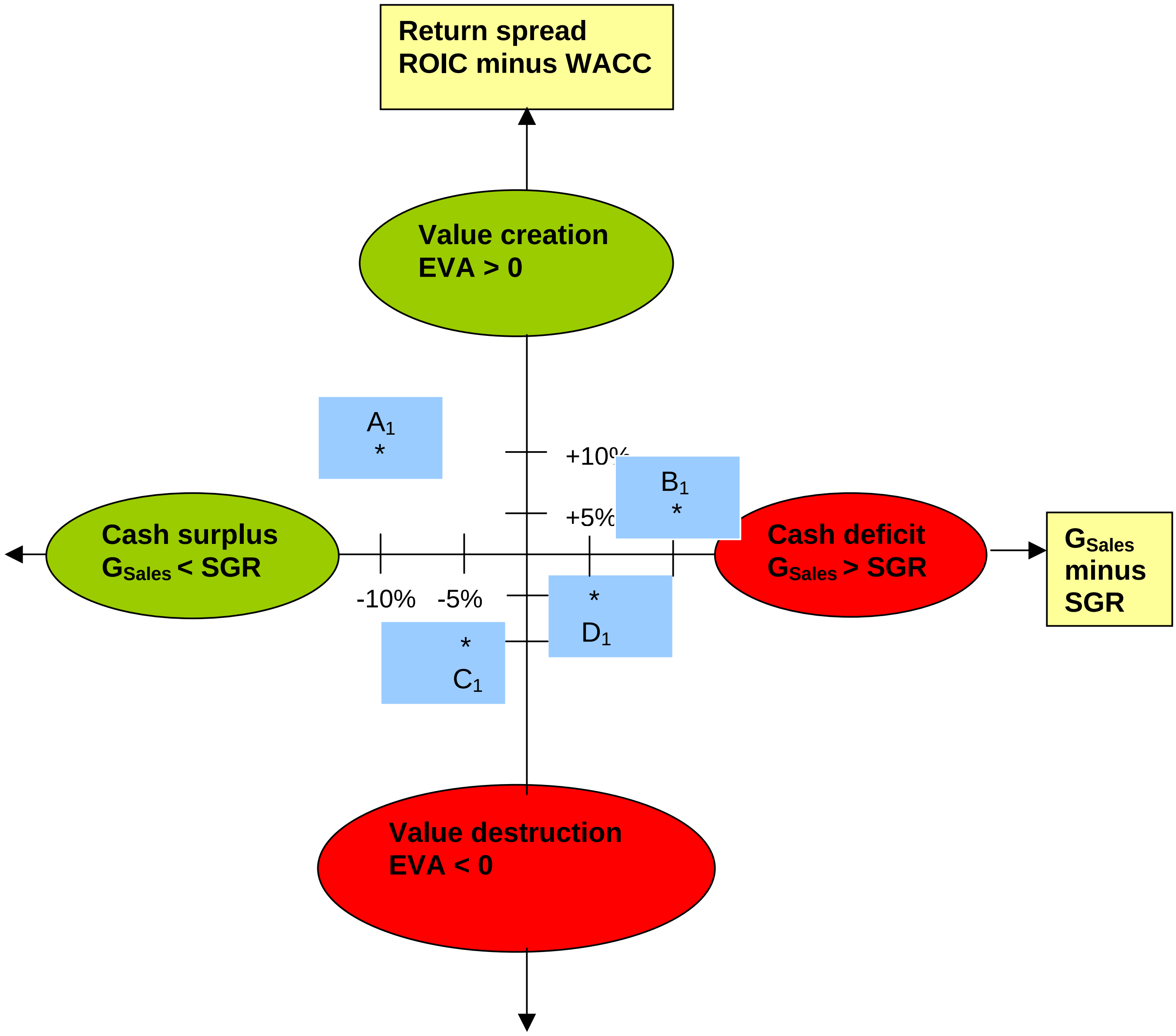
The values required for the placement of the four companies are summarized in Table 6.1.

Table 6.1: Information for the placement of the four companies

Company	ROIC	WACC	Return spread	Sales growth	SGR	(G_{sales}-SGR)	Quadrant
A_1	25%	15%	+10%	20%	30%	-10%	A
B_1	17%	12%	+ 5%	35%	25%	+10%	B
C_1	4%	14%	-10%	15%	20%	-5%	C
D_1	11%	16%	- 5%	20%	15%	+5%	D

The percentage differentials for the return spread and for the sales growth above or below the SGR can now be used to place each company in the financial strategy matrix. The matrix is depicted in Figure 6.2.

Figure 6.2: Four companies placed in the financial strategy matrix



Source: Adapted from Hawawini and Viallet (1999:507)

The financial strategy matrix in Figure 6.2 shows that Company A_1, which has a positive return spread of 10% and actual sales growth of 10% below its SGR, is creating value and generating cash surpluses. It is therefore placed in Quadrant A. Company B_1 has a positive return spread of 5% and actual sales growth of 10% above its SGR. It is creating value, but also generating cash deficits. Based on this, it is placed in Quadrant B.

Company C_1 has a negative return spread of 10% and actual sales growth of 5% below its SGR. The company is destroying value, but it is generating cash surpluses and therefore it is placed in Quadrant C. Lastly, Company D_1 has a negative return spread of 5% and actual sales growth of 5% above its SGR. It is destroying value and generates cash deficits and is therefore placed in Quadrant D.

According to its placement on the financial strategy matrix, a company in each quadrant would be able to identify the specific strategy that would be most effective in improving its position. It could be that considerations other than value creation and cash management may determine the future strategy implemented by the management of each company.

There would also be other possible strategies that could improve the situation of each company. However, the greatest value of the financial matrix to management is the fact that the optimal future strategy for the company can be determined, taking into account the current position of the company and the most preferred position to be in.

6.6 CONCLUSION

Spectacular sales growth and increased profitability are attractive, but pursuing them poses a real threat to companies, especially companies with high capital intensity and working capital requirements. The problem is that it takes additional assets to generate the increase in sales. The internally generated funds plus loans (where applicable) may not be enough to finance the additional assets required.

It is therefore important for a company to know at what rate it can grow its assets and its sales at a sustainable rate so that it does not accumulate cash shortfalls. This maximum growth rate is the SGR and its main components are the company's profitability relative to sales, the asset turnover, the after-tax interest rate, the debt : asset ratio and the earnings retention ratio.

The formula for the SGR can be reduced to a shorter version by multiplying the ROE by the retention ratio, p. As shown above, an even shorter version of the SGR is determined by dividing the retained income by the equity at the beginning of the year. These shortcuts can be used when it is not necessary to analyse the main components of the growth rate, or when the values of the components of the long formula are not available.

Sales growth at a rate higher than the SGR leads to cash shortfalls, while sales growth at a lower rate than the SGR leads to cash surpluses. Both the shortfalls and surpluses are cumulative in the long term and therefore it is in the interests of a company to manage its sales growth so that it stays more or less in line with the SGR.

From a financial management perspective, the greatest challenge in any company is to allocate scarce financial resources optimally. Consequently, companies or business units that destroy value need to be liquidated, sold or eliminated if they cannot be turned around quickly. Companies that do create value should strive to create even more value and therefore need to know the real drivers of value.

The pace at which a company grows relative to its SGR can have a significant impact on the company's cash position. Sales growth (and asset growth to deliver the additional sales) faster than the SGR causes a company to generate cash deficits. Sales growth at a pace slower than the SGR causes a build-up of cash surpluses.

The financial strategy matrix was introduced in this chapter. It is a diagnostic tool that shows the company's value creation and sales growth relative to its SGR.

Companies that are creating value (as indicated by a positive EVA) and also generate cash surpluses (because they grow at a pace slower than their SGR), find themselves in the best situation and are categorized as Quadrant A companies. These companies can use their cash surpluses to invest in even more value-creating projects in order to improve their situation.

Companies that create value (as indicated by a positive EVA), but are also generating cash deficits because they grow too quickly, are classified as Quadrant B companies. These companies need to overcome their cash flow problem by either cutting their dividends or by raising cash by borrowing or by issuing shares. Ultimately, they need to decrease their sales growth so that it is more in line with their SGR.

Quadrant C companies destroy value (as indicated by a negative EVA), but also generate cash surpluses. The only option available to them is to return part of the cash surplus to shareholders and to use the rest of the cash to restructure operations. The restructuring should ensure that both profitability and asset efficiency is improved so that there can be positive value creation. If restructuring does not have a good chance of succeeding, the company must be sold or liquidated.

Quadrant D companies destroy value (as indicated by a negative EVA) and also build up cash deficits because they grow too fast. The only strategic options open to companies in this category is quick, drastic restructuring, or stopping doing business.

Any company should aim to maximize shareholder wealth. This is reflected best not by size in terms of market value, but by increases in the share price, or by the company's MVA. EVA is the fuel that drives MVA and therefore it is vital that EVA is measured and managed, not only at company level, but also at business unit level. Linking the remuneration of managers to EVA obviously gives them an incentive to act as if they were the owners of the company.

Monitoring the current situation and progress of a company by mapping its position on a financial strategy matrix helps managers ensure that they allocate scarce funds wisely. Furthermore it ensures that growth and cash generation are managed well and that the strategic options open to the company in the quest to maximize value for the shareholders are constantly evaluated and considered.

The next chapter contains the empirical research, starting with the research design and then showing the placement of listed companies and sectors on the financial strategy matrix.

CHAPTER 7

RESEARCH DESIGN AND PLACEMENT OF COMPANIES ON A FINANCIAL STRATEGY MATRIX

7.1 INTRODUCTION

The preceding chapters have provided the theoretical foundation and background to which the empirical study can now be added. This chapter describes how the data for the empirical study were selected and how the most important variables were calculated and analysed.

Firstly, the data collection method indicating the initial pool of listed companies from which the final database was selected is discussed. Then the criteria used to determine which companies should be excluded from the database are specified. This is followed by a brief description of the most important variables and how they are determined.

Following on from the description of how the data was selected and processed, the actual ranking of companies and the placement of companies and sectors in the financial strategy matrix can be more clearly understood. The purpose of this ranking was to use rankings and placement in the matrix to identify companies and sectors that had performed very well, ones that had performed very badly and also ones that had improved or deteriorated dramatically during the period under review. Comparisons were done over time and between sectors in order to identify trends or the companies and sectors that consistently out/underperform the others.

7.2 DATA COLLECTION METHOD

The source of the information used in the study was the McGregor's BFA at the University of Pretoria. As a first step, a decision was made to use all the companies listed on the JSE in 2002, a total of 419.

Next, it was decided that for the purposes of this study, only industrial companies would provide the required information to determine the critical variables for the analysis. Therefore companies in the following sectors were eliminated: mining, financial and investments. After these companies had been taken out, 266 companies remained.

The next criterion was the availability of data. In order to have complete, calculated data for the ten-year period from 1993 to 2002, the raw data on each company had to be available for the full twelve-year period from 1991 to 2002 for each company. After the elimination of companies with incomplete data, 110 remained.

The final requirement for inclusion in the database was that the data had to be reliable. This aspect was pertinent to this study because the beta factor used in the determination of the cost of equity and the WACC cannot be determined reliably for companies with thinly traded shares. For this reason, all companies with thinly traded shares were eliminated from the database. Companies for which the ordinary share trading volume was below 500 000 shares per year for any of the twelve years from 1991 to 2002 were excluded. The minimum level was set at 500 000 shares traded per year because trading volumes below 500 000 are considered as thin trading.

The number of companies that remained in the final database was 89. A list with the names of these companies is included in Appendix A at the end of this thesis.

A list of the sub-sectors under which the companies in the final database are categorised is also provided Appendix B.

7.3 MOST IMPORTANT VARIABLES

The most important variables used for the statistical analysis were the following:

(a) ROIC;
(b) WACC;
(c) Spread (ROIC – WACC)
(d) EVA;
(e) MVA;
(f) Sales growth;
(g) SGR; and
(h) Sales growth minus the SGR

The ROIC was calculated by dividing the NOPAT by the IC at the beginning of the year and expressing it as a percentage. The WACC was determined by using appropriate weights for each component of long-term capital. A risk-free rate, the market premium and a beta-factor were used to calculate the cost of equity. For the other components of long-term capital, such as long-term loans, the appropriate after-tax cost was used.

The spread, also called the “return spread”, was determined by subtracting the WACC from the ROIC. The EVA was calculated by multiplying the spread with the IC. The EVA was determined for a given year and was expressed as an amount (in Rands). The MVA was calculated by first determining the market value of ordinary shares, preference shares, long-term loans and minority interest. Then the book value of all these items was subtracted from the market values to determine the MVA. The MVA was also expressed as an amount in Rands and it was a cumulative amount to date because it indicates all the value added (in terms of market value) by a company from when it started doing business to a given date.

The sales growth is the year-on-year increase/decrease in sales (expressed as a percentage), which can theoretically be determined by dividing the sales amount of the previous year into the amount of the current year and then subtracting one from the result. However, this formula is not always accurate because companies often restate the sales of the previous year. The companies provide a more reliable estimate of year-on-year sales growth and this percentage was used in the analysis.

The SGR for a given year (also expressed as a percentage) was determined by dividing the retained income from the previous year by the equity at the beginning of that (previous) year. The equity at the beginning of the previous year is also the equity at the end of two years before, and therefore the calculation of the SGR for a ten-year period required the data to be available for a twelve-year period. The sales growth minus SGR is the sales growth percentage minus the SGR percentage.

Each of the variables discussed in this chapter was used in the evaluation of listed companies and the statistical analysis described in Chapter 8.

7.4 RANKING OF COMPANIES

As a first step, a simple ranking was done in terms of spread alone. It was decided to leave out sales growth initially in order to focus on companies' ability to earn returns above their cost of capital. The rankings were done for four periods, namely the year 2002 (this reflected the most recent results available), 1993 to 1997 (the median spread for the 5-year period was used for each company), 1998 to 2002 and the ten-year period from 1993 to 2002. The top ten companies and ten worst companies for each period are presented in Table 7.1a and Table 7.1b. The full lists with the rankings for each period are given as Appendix C for 2002, Appendix D for 1993 to 1997, Appendix E for 1998 to 2002 and Appendix F for 1993 to 2002.

Table 7.1a: Ranking of the top ten companies in terms of spreads for 2002

RANK	COMPANY	SECTOR	SPREAD % (ROIC – WACC)
1	WOOLTRU	12	206,9
2	JOHNCOM	15	160,5
3	SHOPRITE	21	38,7
4	PALS	10	37,7
5	MNET-SS	15	28,5
6	ALTECH	18	27,2
7	CASHBIL	5	25,2
8	PICKNPAY	21	24,8
9	ASPEN	9	23,2
10	BOWCALF	13	22,7

Table 7.1b: Ranking of the worst ten companies in terms of spreads for 2002

RANK	COMPANY	SECTOR	SPREAD % (ROIC – WACC)
80	SISA	14	-5,9
81	ISCOR	4	-7,1
82	FORIM	8	-7,4
83	RICHEMONT	10	-8,1
84	DIDATA	20	-10,9
85	TRENCOR	16	-11,0
86	CONAFEX	7	-15,2
87	NAMSEA	7	-16,4
88	SPESCOM	20	-35,2
89	ANBEECO	13	-380,4

Looking at the top ten companies for 2002, it is clear that the first two, namely Wooltru and Johnnic Communications (Johncom), had extremely high spreads, which are completely out of line with their spreads for preceding years. In both cases, the high spreads were due to an abnormally high ROIC. If these two values are considered as outliers, Shoprite (with a more realistic spread of 38,7%) can be considered the best performer in terms of spreads for 2002. It is interesting to note that the only other company in the food and drug-retailing sector, Pick'nPay, also featured in the top ten.

As far as the worst ten companies are concerned, the very worst company, in 89th place, Anbeeco (with a spread of –380,4%) can be considered an outlier. If this outlier is ignored, it leaves Spescom (with a spread of –35,2%) as the worst performer for 2002. Another noteworthy fact is that the only sub-sector for which there was more than one company in the bottom ten was the food producers and processors sector (Conafex and Namibean Sea Products). The next ranking was done using the median spread for each company over the period from 1993 to 1997. The results are shown in Table 7.2a and Table 7.2b.

Table 7.2a: Ranking of top ten companies in terms of median return spreads for the period from 1993 to 1997

RANK	COMPANY	SECTOR	SPREAD % (ROIC – WACC)
1	OCEANA	7	21,6
2	SHOPRITE	21	19,3
3	WBHO	5	17,1
4	PICKNPAY	21	16,5
5	CONCOR	5	13,3
6	JASCO	18	13,1
7	CMH	11	11,4
8	BOWCALF	13	10,5
9	DELTA	18	9,9
10	BRANDCO	12	9,8

Table 7.2b: Ranking of the worst ten companies in terms of median return spreads for the period from 1993 to 1997

RANK	COMPANY	SECTOR	SPREAD % (ROIC – WACC)
80	BASREAD	5	-6,5
81	ISCOR	4	-7,1
82	SAPPI	3	-9,2
83	SPESCOM	20	-9,5
84	CONAFEX	7	-10,4
85	HIVELD	4	-10,7
86	LABAT	24	-11,6
87	RAINBOW	7	-15,2
88	CULLINAN	14	-15,6
89	LA-GROUP	12	-19,9

When the median spreads are compared for the period from 1997 to 2002, Oceana emerges as the top company with a spread of 21,6%. Both Shoprite (2^{nd}) and Pick'nPay (4^{th}) also appear in the top ten for this period as well. Compared to 2002, the spreads of the top companies for the period 1993 to 1997 appear considerably lower.

LA-Group had the lowest median spread for the period from 1993 to 1997. Other companies amongst the worst ten that also appeared in the worst ten for 2002 are Iscor, Spescom, and Conafex. The only sub-sector for which there was more than one company in the bottom ten for this period was the food producers and processors sector (as for 2002).

The ten best and ten worst companies in terms of spread medians for the period from 1998 to 2002 are shown in Table 7.3a and Table 7.3b respectively.

Table 7.3a: Ranking of the top ten companies in terms of median return spreads for the period from 1998 to 2002

RANK	COMPANY	SECTOR	SPREAD % (ROIC – WACC)
1	MNET-SS	15	24,9
2	PICKNPAY	21	24,8
3	SHOPRITE	21	23,4
4	ASPEN	9	22,8
5	OCEANA	7	20,6
6	CERAMIC	5	20,5
7	BOWCALF	13	19,1
8	GRINTEK	18	16,8
9	CASHBIL	5	16,5
10	CMH	11	16,2

Table 7.3b: Ranking of the worst ten companies in terms of median return spreads for the period from 1998 to 2002

RANK	COMPANY	SECTOR	SPREAD % (ROIC – WACC)
80	HIVELD	4	-5,8
81	ISCOR	4	-5,9
82	TRENCOR	16	-7,0
83	FORIM	8	-7,4
84	RAINBOW	7	-8,5
85	NAMSEA	7	-9,1
86	GLODINA	10	-10,1
87	DIDATA	20	-10,9
88	CONAFEX	7	-14,9
89	ANBEECO	10	-37,7

The company with the highest median spread for the period 1998 to 2002 was MNet-Supersport with 24,9%. Pick'nPay and Shoprite were second and third respectively, while Oceana (5th) and Bowler Metcalf (7th) remained in the top ten. Both the food and drug retailing sub-sector (Pick'nPay and Shoprite) and the construction and building materials sub-sector (Ceramic and Cashbuild) were represented by two companies each in the top ten. The median spreads of the top ten companies for this period (1998 to 2002) seem to be considerably higher than those for the period from 1993 to 1997.

At the bottom end, the company that performed worst in the period from 1998 to 2002 was Anbeeco (as in 2002) with a spread of –37,7%. Three companies (Rainbow Chickens, Namibean Sea Products and Conafex) from the food producers and processors sub-sector were in the "worst ten" group. Companies that featured in the "worst ten" group for both periods (1993 to 1997 and 1998 to 2002) are Iscor, Rainbow Chickens and Conafex. Lastly, a ranking was done of median spreads per company for the ten-year period, from 1993 to 2002. The results are shown in Table 7.4a and Table 7.4b.

Table 7.4a: Ranking of the top ten companies in terms of median return spreads for the period from 1993 to 2002

RANK	COMPANY	SECTOR	SPREAD % (ROIC – WACC)
1	MNET-SS	15	24,6
2	PICKNPAY	21	21,9
3	OCEANA	7	21,1
4	SHOPRITE	21	19,7
5	CMH	11	15,8
6	WBHO	5	15,7
7	BOWCALF	13	12,8
8	CERAMIC	5	12,8
9	GRINTEK	18	12,3
10	CONCOR	5	11,6

Table 7.4b: Ranking of the worst ten companies in terms of median return spreads for the period from 1993 to 2002

RANK	COMPANY	SECTOR	SPREAD % (ROIC – WACC)
80	WBHOLD	7	-5,3
81	NAMSEA	7	-5,4
82	SAPPI	3	-5,5
83	GLODINA	10	-5,7
84	ISCOR	4	-6,6
85	LABAT	24	-8,3
86	SPESCOM	20	-8,4
87	RAINBOW	7	-9,9
88	HIVELD	4	-10,1
89	CONAFEX	7	-13,8

Perusal of the results for the ten-year period from 1993 to 2002 shows that MNet-Supersport was the best company, with a median spread of 24,6%. Pick'nPay (2nd), Oceana (3rd) and Shoprite (4th) showed their consistency by consistently appearing in the top five. Bowler Metcalf (7th) also remained in the top ten for all four periods.

At the bottom end, Conafex had the worst median spread of –13,8% over the period from 1993 to 2002. Three companies from the food producers and processing sub-sector (Namibia Sea Products, Rainbow Chickens and Conafex) formed part of the "worst ten" category.

When the median is taken of the spreads for 2002 and the median spreads for the other periods, the results are as follows: for the period from 1993 to 1998, the median spread was 1,8%; for the period from 1993 to 2002, the median spread was 1,9%; for the period from 1998 to 2002, the median spread was 4,6% and the median for 2002 was 6,5%. This indicates a clearly increasing trend in terms of spreads over time from 1993 to 2002 for the companies selected.

Particular companies that showed big improvements between the two five-year periods were MNet-Supersport (moving from 24th to 1st place), Aspen (from 49th to 4th), Cashbuild (from 30th to 9th). Companies that deteriorated dramatically were, among others, Brandcorp (dropping from 10th to 35th), Edcon (from 11th to 53rd) and Wooltru (from 18th to 74th).

7.5 PLACEMENT OF COMPANIES AND SECTORS IN THE FINANCIAL STRATEGY MATRIX

In this section of the study, companies and sectors were placed in the financial strategy matrix. A graph was used with the growth in sales minus the SGR on the x-axis and the spread (ROIC – WACC) on the y-axis. Three individual companies, one very good performer in terms of spreads (Pick'nPay), one very poor performer (Conafex) and one average performer (Ellerine) were selected and placed on the financial strategy matrix for each year from 1993 to 2002. The graphs are presented in Figure 7.1, Figure 7.2 and Figure 7.3.

The quadrants of the financial strategy matrix are indicated on each graph. "A" indicates a positive spread and negative sales growth minus the SGR percentage. "B" shows a positive spread and a positive sales growth minus the SGR percentage. "C" is used for a negative spread and a negative sales growth minus the SGR percentage. "D" is used for a negative spread and a positive sales growth minus the SGR percentage. In some cases where there were only positive returns over the full period involved, only the "A" and "B" quadrants are shown. Similarly, if there were only negative spreads, only the "C" and "D" quadrants are shown in the graph. In those cases where there were outliers that would distort the graph, the scales of the graphs were set to eliminate these outliers.

7.5.1 Summary of the results for three individual companies

Figure 7.1 shows that Pick'nPay consistently had positive spreads for the whole period under review, from 1993 to 2002. Its excellent performance is emphasised by the fact that its spread was more than 20% each year for the last seven years from 1996 to 2002. As far as its sales growth is concerned, the graph shows that the sales growth minus the SGR was negative for four years and positive for six years. It is also not possible to find a trend that indicates that the growth in sales is managed in such a way that it remains below the SGR percentage.

It has been pointed out in Section 6.4 of Chapter 6 that a positive sales growth minus the SGR percentage may lead to cash deficits. Different factors that influence and distort sales growth and the SGR may cause the sales growth minus the SGR percentage to be unreliable as a measure of cash management.

The SGR, which is based on the retained income of a given year, would remain the same if there is an increase in assets financed by new issues of shares or loans leading to an increase in sales. In such a situation, the sales growth minus the SGR could be very high (positive) and yet it may be wrong to infer from this that the company is growing too fast (and has run up cash shortages). Consequently, further investigation would be required to determine the impact of sales growth on shareholder value.

Looking at the results of Conafex, it is clear that there were negative spreads for each of the ten years from 1993 to 2002. It seems as if the trend in terms of spreads got worse over time. Not surprisingly, the results for five years fell in the "D" quadrant, where the only options left to the company are to restructure radically or to close down.

The results of the company Ellerine indicate low to average spreads, but the spread was negative for only one year (1999). The differential between sales growth and the SGR remained negative for the whole ten-year period. Consequently, the results fall in the "A" quadrant for nine out of the ten years.

It would be interesting to see how much weight the market gives to a company's ability to limit its sales growth to a percentage below its SGR. The data of the companies included in the database seems to indicate that there is no pattern as far as sales growth relative to the SGR percentage is concerned.

Figure 7.1: Pick'nPay – each year from 1993 to 2002

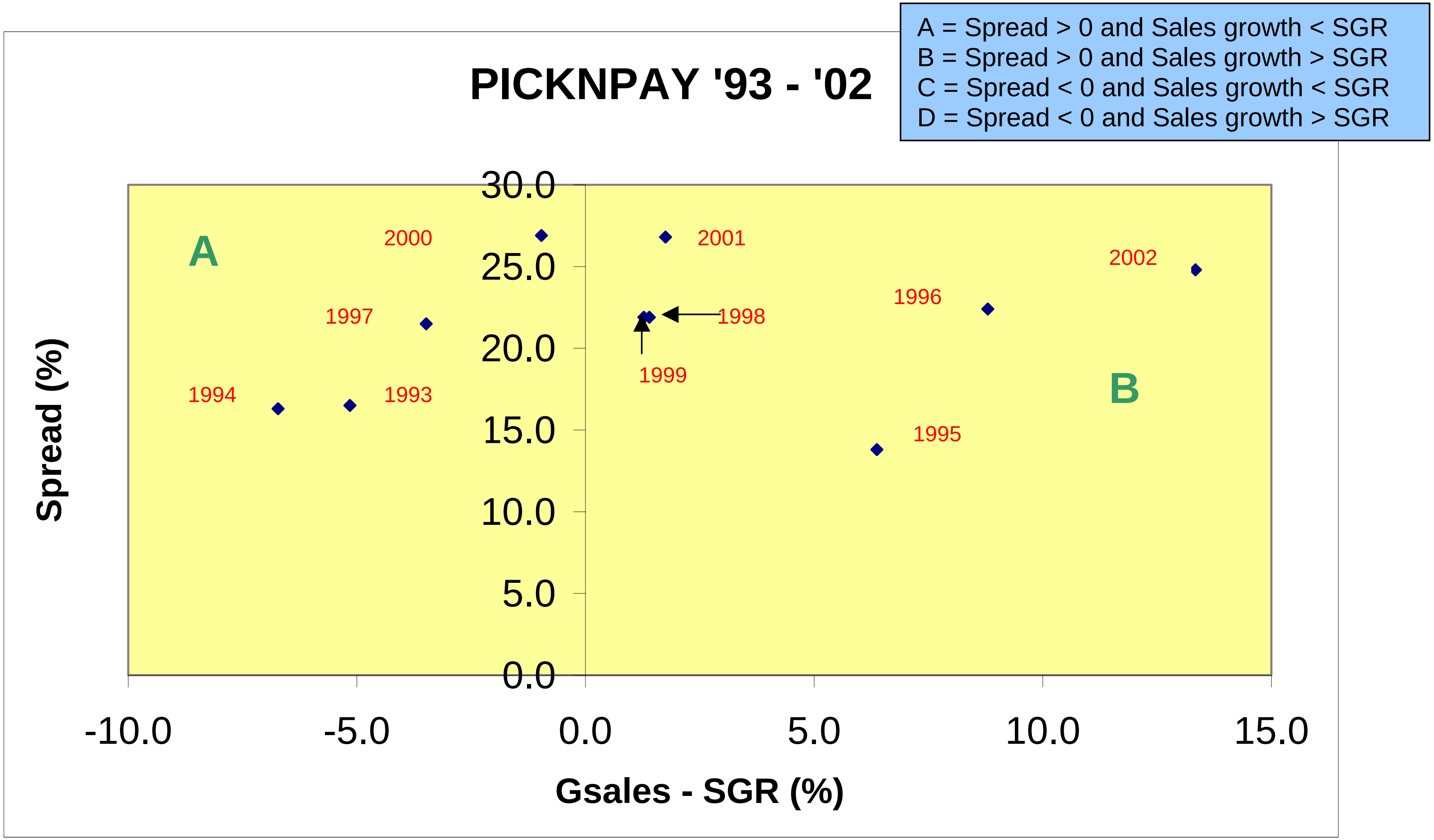


Figure 7.2: Conafex – each year from 1993 to 2002

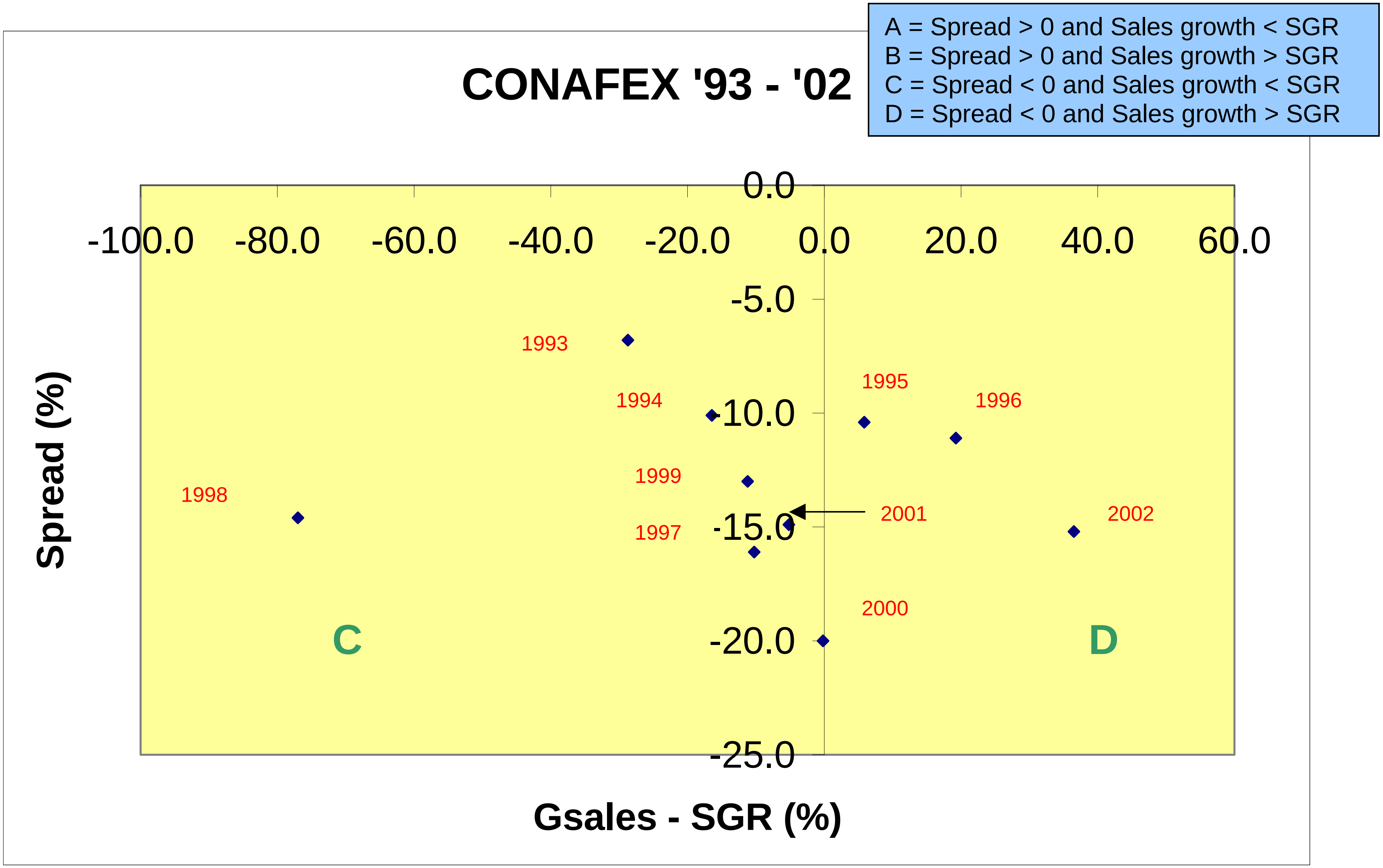
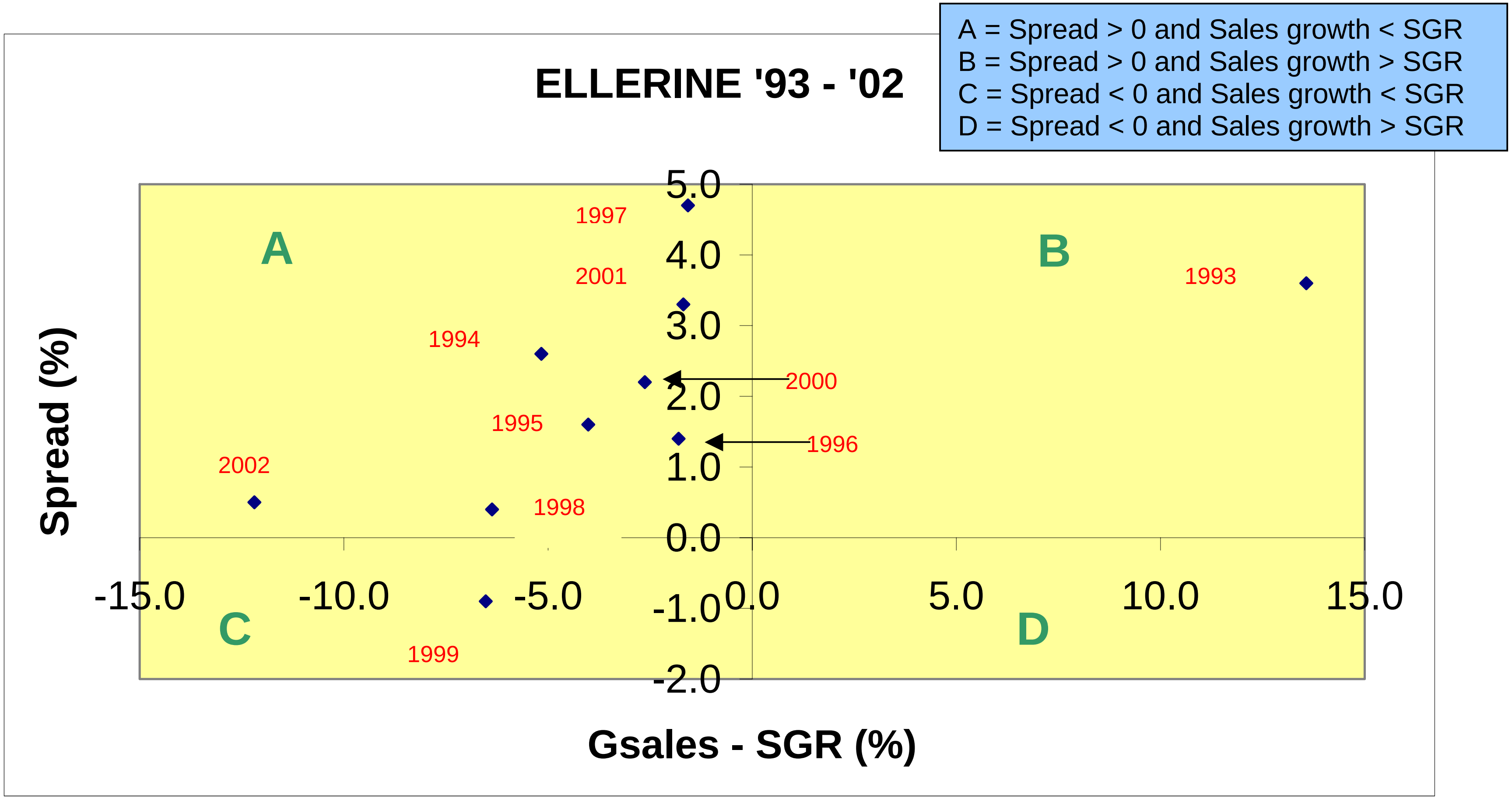


Figure 7.3: Ellerine – each year from 1993 to 2002



In order to facilitate a comparison between the results of the three companies (Pick'nPay, Conafex and Ellerine) with that of the sub-sectors in which they operate, the results of the particular sub-sectors are also placed on the matrix. Figure 7.4 contains the median results for Sub-sector 21 (food and drug retailing). Figure 7.5 shows the results of Sub-sector 7 (food producers and processors). Figure 7.6 shows the results for Sub-sector 12 (general retailers).

7.5.2 Summary of results for the sub-sectors

It is clear from Figure 7.4 that Sub-sector 21 (consisting only of Shoprite and Pick'nPay) had excellent results in terms of spreads throughout the ten-year period. Figure 7.5 shows that Sub-sector 7, which includes ten companies, had nine median spreads that were negative and only one that was positive. The results for Sub-sector 12, which has 14 companies, appear average, with nine out of ten positive spreads over the ten-year period.

As a next step, the medians per sector were determined for the four periods decided on at the beginning, namely 2002, 1993 to 1997, 1998 to 2002 and 1993 to 2002. The results for these periods are set out in Figure 7.7 (2002), Figure 7.8 (1993 to 1997), Figure 7.9 (1998 to 2002) and Figure 7.10 (1993 to 2002).

Figure 7.7 shows that, for 2002, the median spread (31,8%) for the food and drug retailing Sub-sector (sector 21) was significantly higher than that for all the other sectors (next best was about 10%). The majority of sectors (17 out of 21) had positive median spreads. The results of two sectors were ignored as outliers. Of the 21 sectors, 13 were categorized in Quadrant B and only four in Quadrant A.

The sub-sector medians for the five-year period from 1993 to 1997 are shown in Figure 7.8. Sector 21 stands out as the best performer for this period, with a median spread of 18,7% (the next best 9,1%). Of the 23 sectors, 14 (61%) had positive median spreads. Eleven sectors were placed in the B quadrant and only three sectors were included in the A quadrant.

Figure 7.9 shows the sub-sector medians for the period from 1998 to 2002. In this period, two sectors, namely Sectors 21 and 9 (pharmaceuticals and biotechnology, with only one company, Aspen) stood out with spreads significantly higher than the other sub-sectors. Of the sub-sectors, 16 had positive median spreads, while 11 were categorized in the B quadrant. Five sub-sectors were placed in the A quadrant, as well as five in the D quadrant. Compared to the preceding five-year period, it seems as if there was a slight improvement in the results.

The medians for the ten-year period from 1993 to 2002 are set out in Figure 7.10. Sector 21 with a median spread of 21,2% (next best 8,3%) again stands out as the best performing sector by far. Of the 23 sub-sectors, 14 had positive spreads, while 10 sub-sectors were classified in the B quadrant. Four sub-sectors were placed in the A quadrant and eight in the D quadrant.

Figure 7.4: Sector 21 medians per year 1993 to 2002

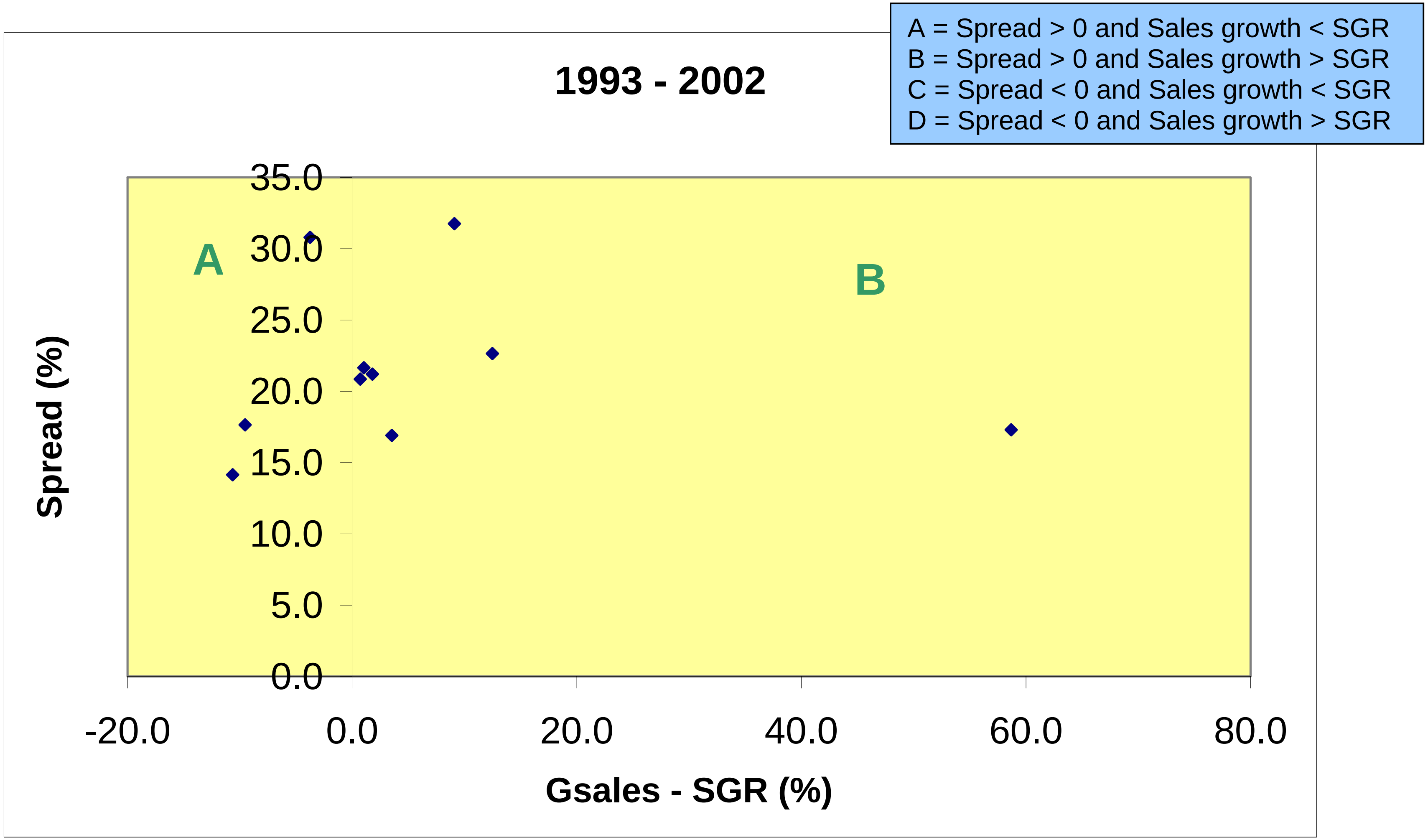


Figure 7.5: Sector 7 medians per year from 1993 to 2002

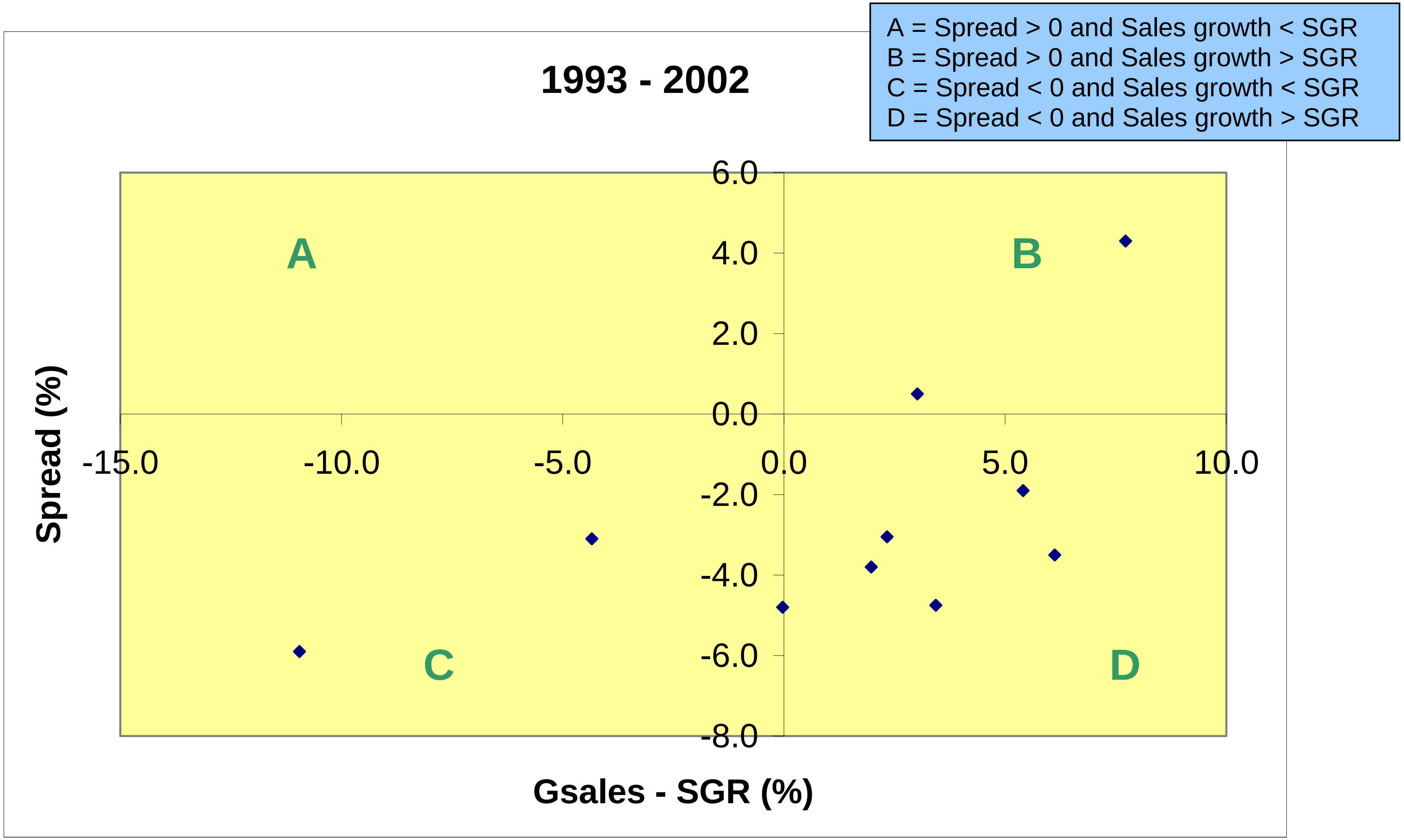


Figure 7.6: Sector 12 medians per year from 1993 to 2002

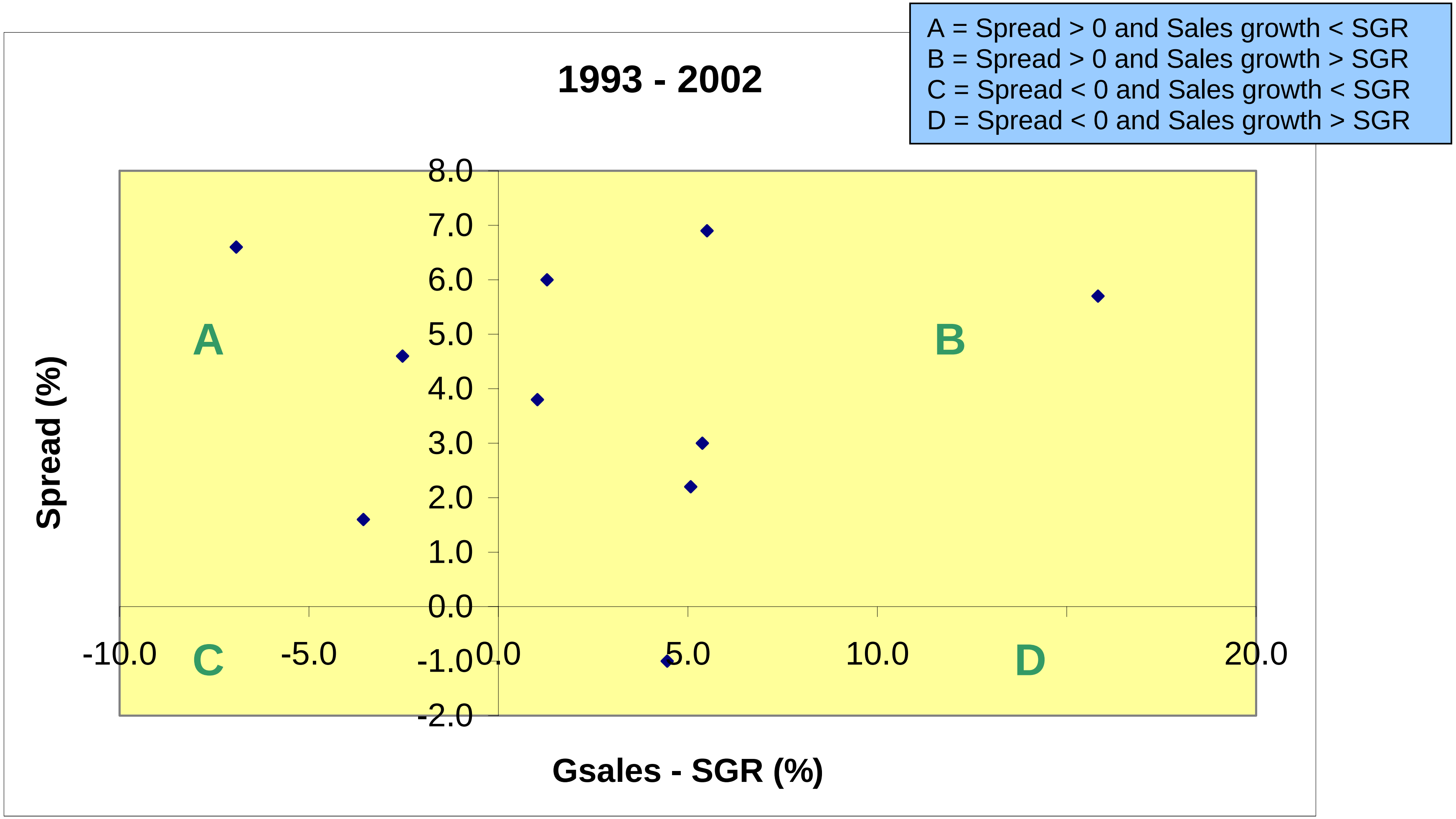


Figure 7.7: Medians per sub-sector 2002

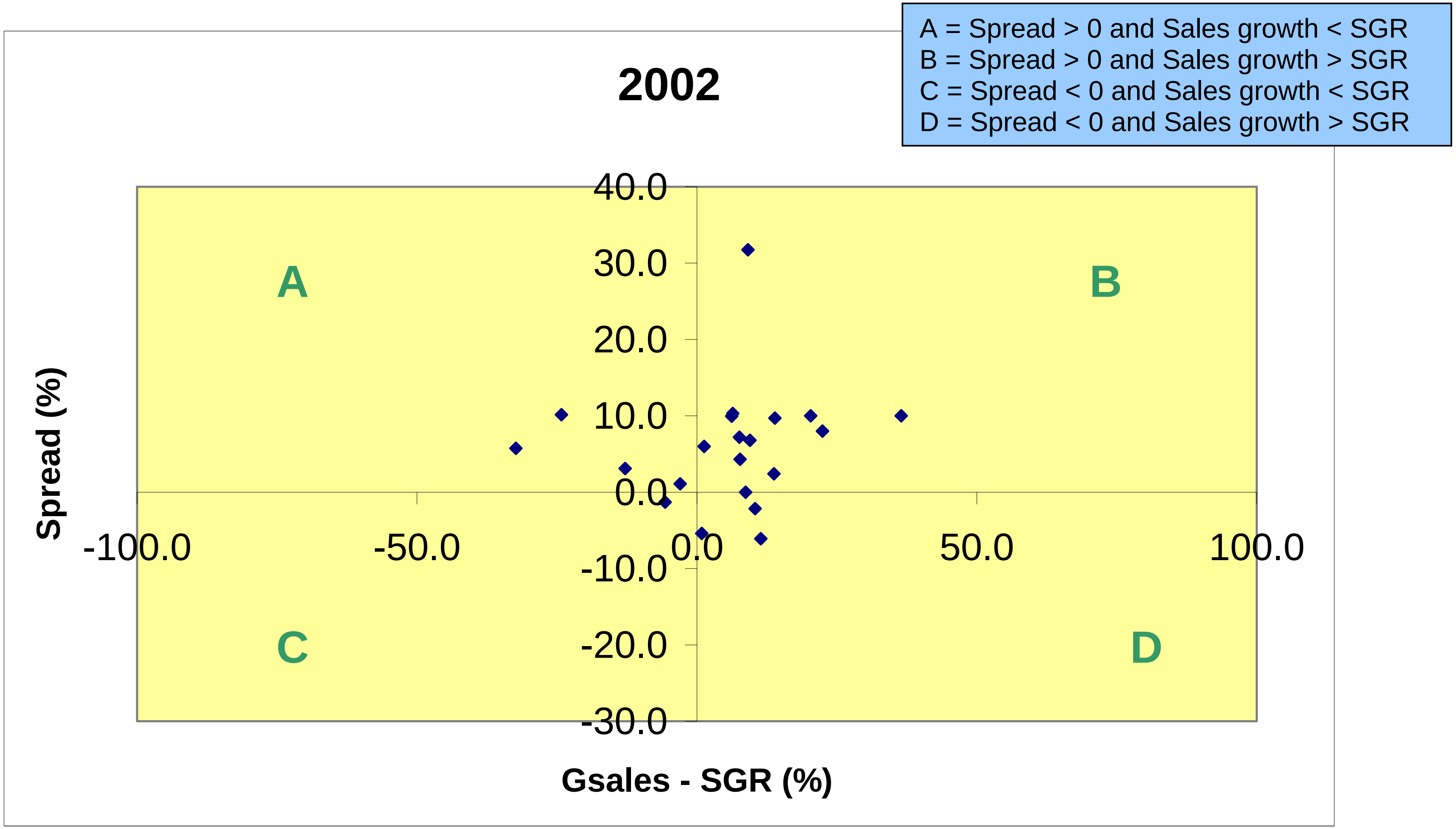


Figure 7.8: Medians per sub-sector 1993 to 1997

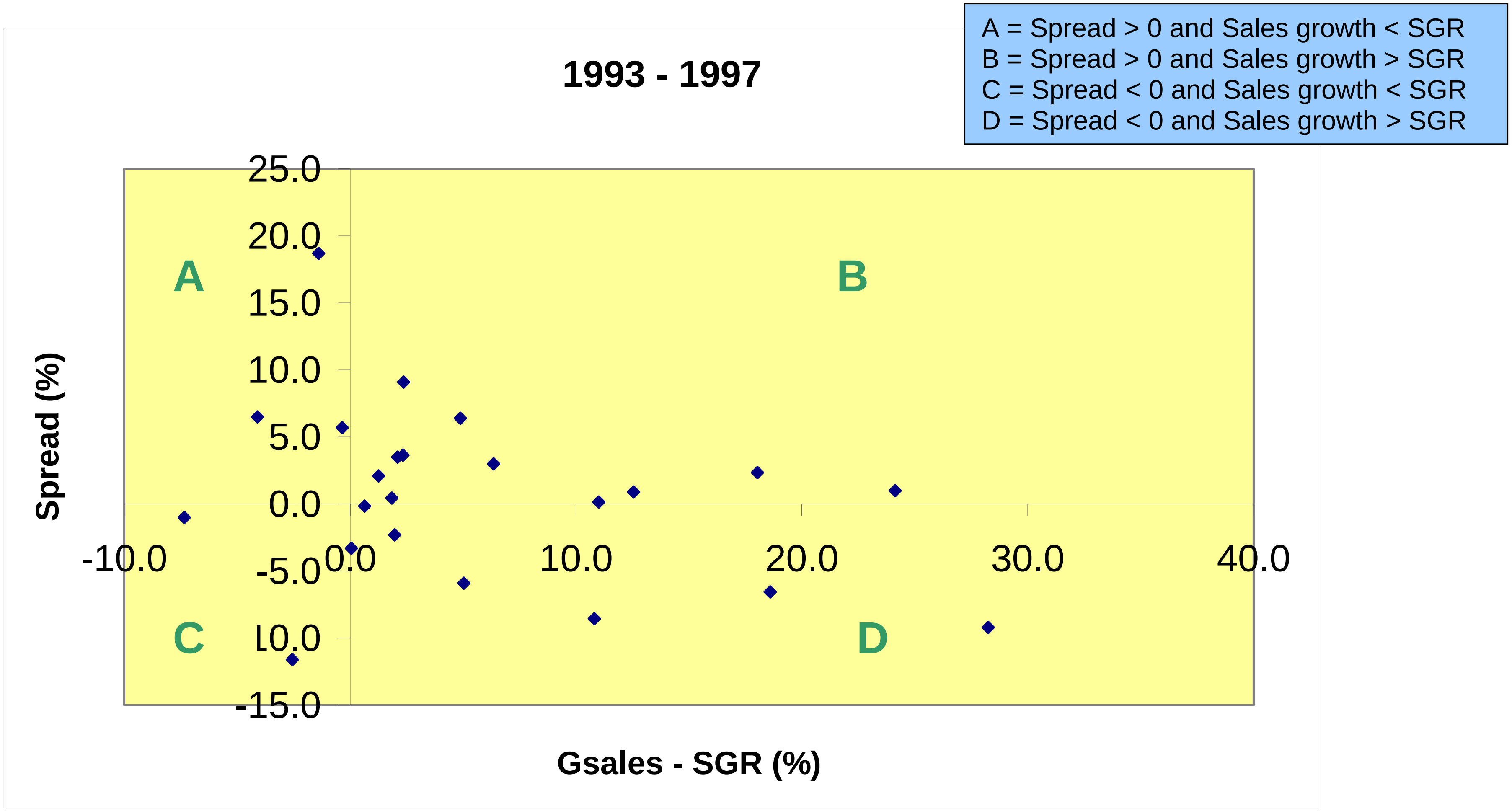


Figure 7.9: Medians per sub-sector 1998 to 2002

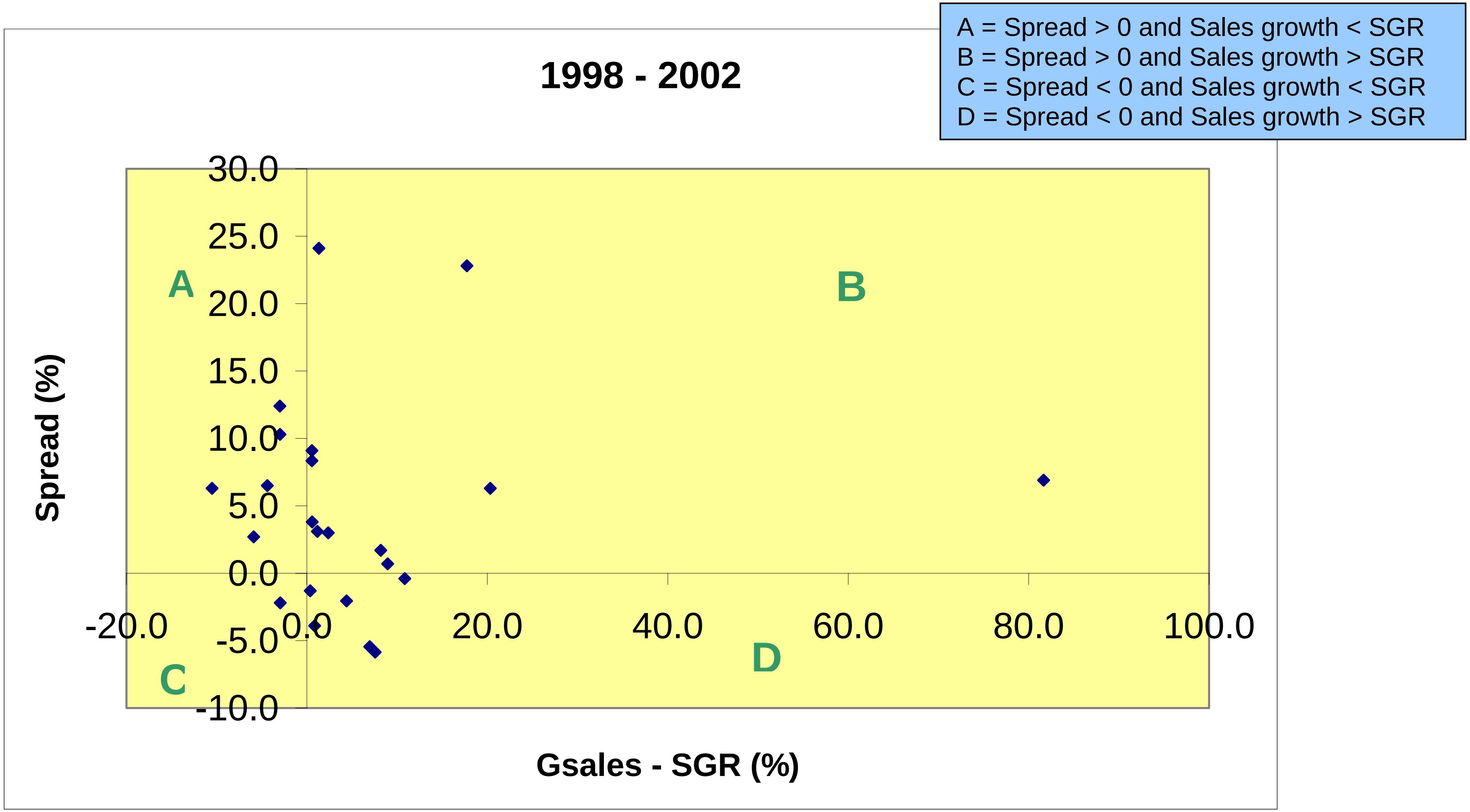
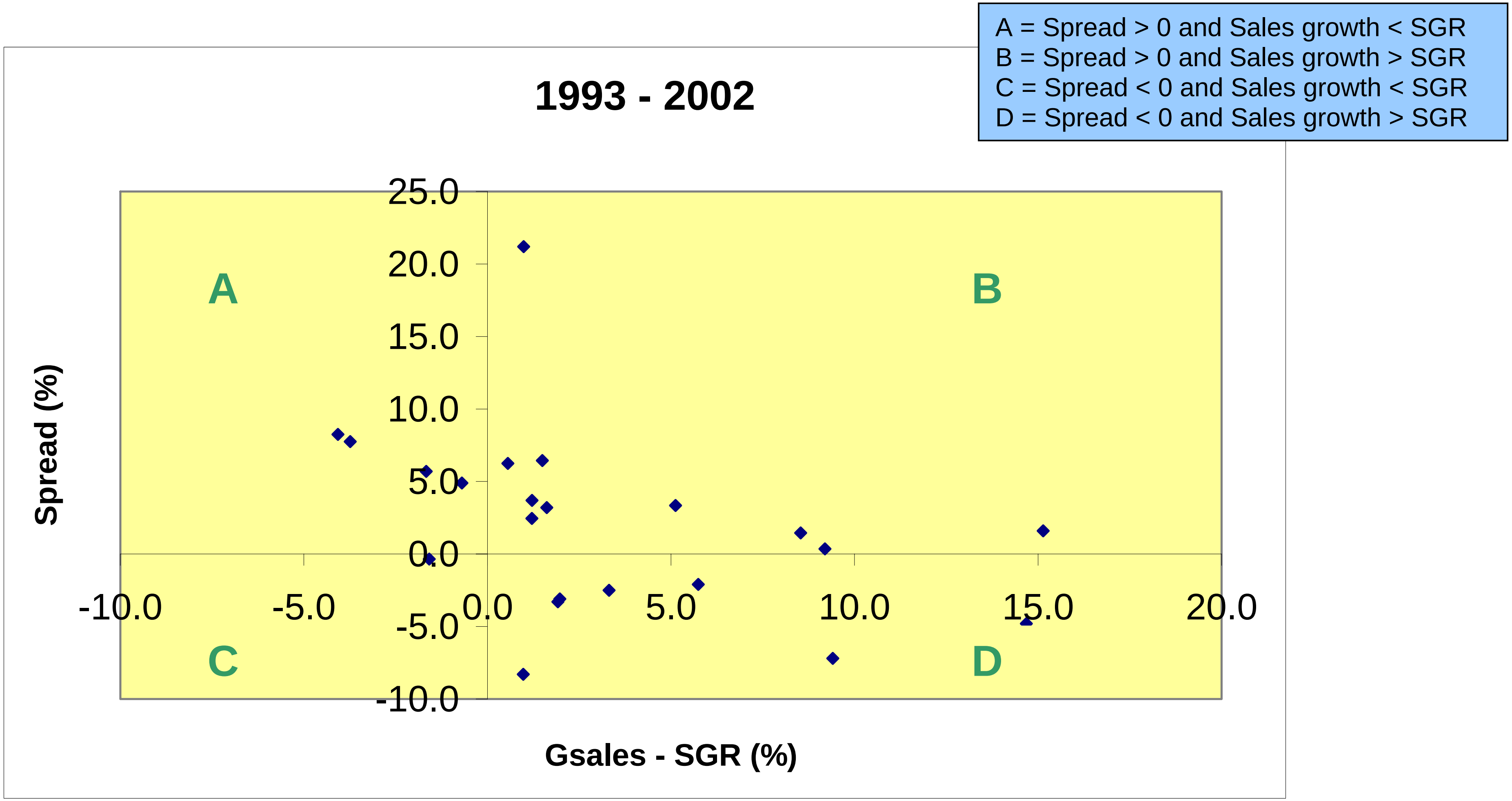


Figure 7.10: Medians per sub-sector 1993 to 2002



The next step in the evaluation of the performance of companies was to place all the companies in the financial matrix for each year, from 1993 to 2002. The results are shown in a series of graphs included in Figure 7.11 (for 1993), Figure 7.12 (for 1994), Figure 7.13 (for 1995), Figure 7.14 (for 1996), Figure 7.15 (for 1997), Figure 7.16 (for 1998), Figure 7.17 (for 1999), Figure 7.18 (for 2000), Figure 7.19 (for 2001) and Figure 7.20 (for 2002).

7.5.3 Summary of results for all companies

The results for 1993 in Figure 7.11 show that slightly more companies had positive spreads, compared to those with negative spreads. Wilson Bayly Holmes-Ovcon Limited (WBHO) had the highest spread (29,7%), with Shoprite second best at 18,1%. The company with the lowest spread was the LA-Group (-19,9%). In terms of the sales growth minus the SGR percentage, it seems as if the number of companies with positive percentages versus those with negative percentages was split more or less evenly.

The results for 1994 in Figure 7.12 show that the majority of companies had positive spreads, with MNet-Supersport being the best performer with a spread of 47%. The LA-group (-25,1%) was again the worst performer. As far as the sales growth minus the SGR percentage is concerned, it looks as though there were more companies with a positive percentage than there were companies with a negative percentage.

Figure 7.13 indicates that Combined Motor Holdings (CMH) had the best performance in 1995 with a spread of 32,1%. For the third year in a row, the LA-Group had the worst spread (-35,3%). It seems as if there were more companies with positive spreads, compared to those with negative spreads. There were significantly more companies with positive sales growth minus the SGR percentages than there were ones with negative percentages.

The 1996 results in Figure 7.14 reveal that in general there seem to have been no dramatic changes from 1995. The majority of companies had positive spreads, and CMH was again the highest, with 25,6%. This time Rainbow Chickens, with a spread of –20,4%, was the worst performer. As far as the sales growth minus the SGR percentage is concerned, it appears as if more companies had positive percentages than negative percentages.

The results for 1997 in Figure 7.15 show that there were an equal number of companies with positive and negative spreads. The company with the highest spread for 1997 was Basil Read, with 38,9%. Cullinan Holdings was the worst performer this time, with a spread of –32,1%. The number of companies with a positive sales growth minus the SGR percentage seemed to be equal to the number of those with a negative percentage.

The results for 1998 in Figure 7.16 show that the majority of companies (more than in 1997) had positive spreads. There is a bigger dispersion of positive spreads than a dispersion of negative spreads. Basil Read was, as in 1997, the best performer in terms of spreads (44,9%). Rainbow Chickens (–22,8%) had the worst spread in 1998. There seem to have been slightly more companies with positive sales growth minus the SGR percentages than ones with negative percentages.

Figure 7.17 shows that the number of companies that had a positive spread in 1999 was a little higher than those with a negative spread. It also seems as if the dispersion of the values with positive spreads is bigger than for the values with negative spreads. MNet-Supersport (24,9%) performed best in terms of spreads in 1999. The company with the worst results was Anbeeco, with a spread of –37,7%. It appears as if there were about as many companies with a positive sales growth minus the SGR percentage as there were companies with a negative percentage.

The results for 2000 as presented in Figure 7.18 show that slightly more companies had positive spreads compared to those with negative spreads. Pick'nPay had the best spread (26,8%), and MNet had the second best (24,2%). Conafex had the worst spread (–20,0%). The number of companies with a positive sales growth minus the SGR percentage seems to have been higher than of those with a negative percentage.

Figure 7.19 shows quite clearly that there were many more companies with positive spreads compared to those with negative spreads in 2001. Shoprite had the highest spread of 34,7% and Aspen was second best, with 27,2%. The company with the worst spread was Anbeeco with –88,4%. When the sales growth minus the SGR percentage is considered, it seems as if more companies had positive percentages than negative percentages. This means that there were more companies creating value than companies destroying value in terms of spreads (and EVA). It also seems as if these percentages were more widely dispersed than in preceding years.

The results for 2002 in Figure 7.20 show distinctly that there were far more companies with positive spreads (creating value) than ones with negative spreads (destroying value). As in 2002, Shoprite was the best performer in terms of spreads, with 38,7%. PALS Holdings was second best with 37,7%. The worst performer in 2002 was Namibian Sea Products with a spread of –16,4%. It is also clear that a larger number of companies had positive sales growth minus the SGR percentages compared to the number of ones with negative percentages.

As another way to compare the results from year to year, the median results of all companies for each year from 1993 to 2002 are shown in Figure 7.21. It shows that the median spread for all companies was positive each year from 1993 to 2002 (with a lowest spread of 0,4% in 1996 and a highest spread of 6,5% in 2002). In terms of spreads, there was a clear upward trend from 1999 (1,4%) to 2002 (6,5%). The median sales growth minus the SGR percentage was negative for only three years (1993, 1997 and 1999). For the other years, the median sales growth minus the SGR percentage was positive, indicating a possible build-up of cash shortages.

Figure 7.11: Results all companies 1993

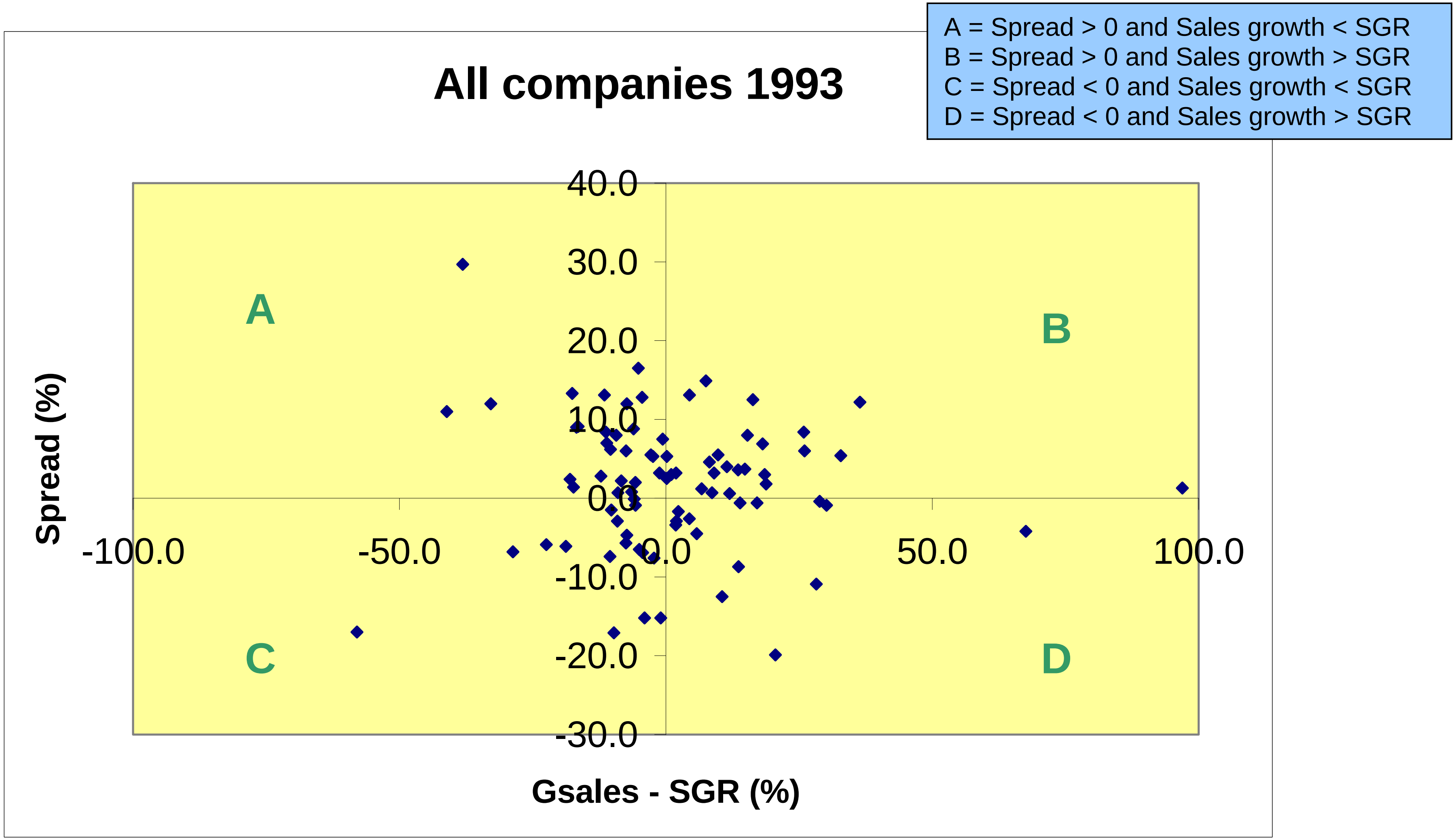


Figure 7.12: Results all companies 1994

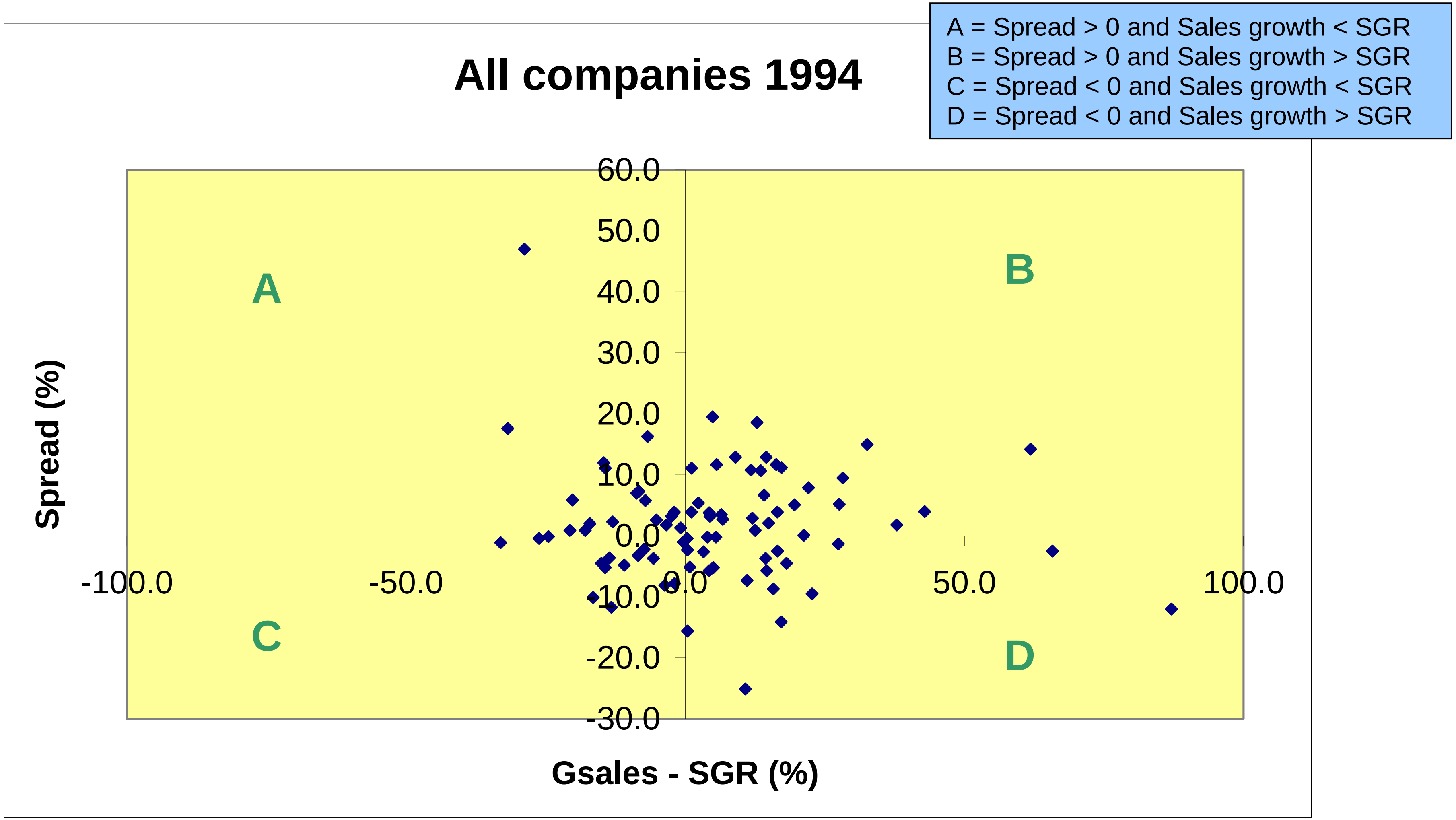


FIGURE 7.13: Results all companies 1995

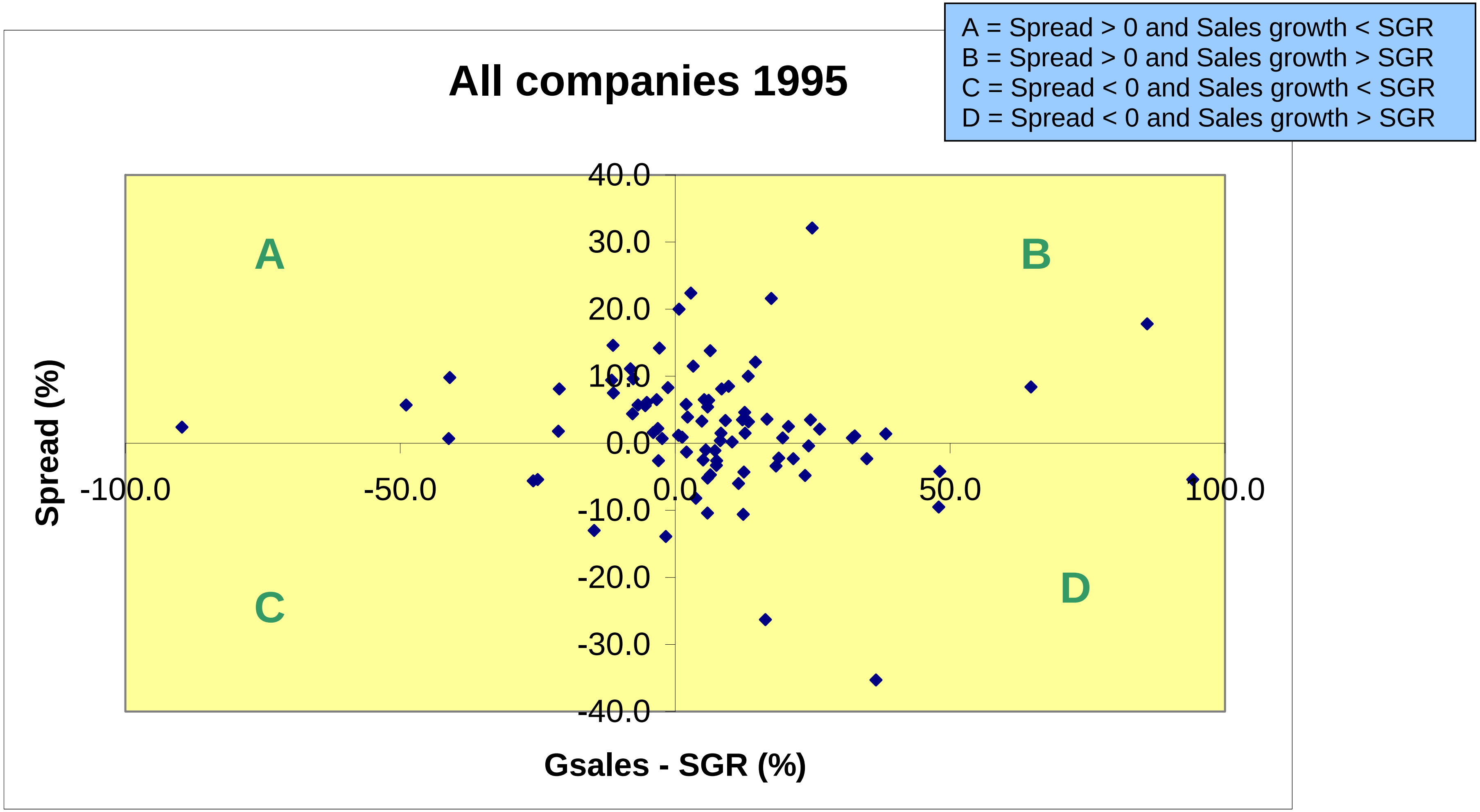


FIGURE 7.14: Results all companies 1996

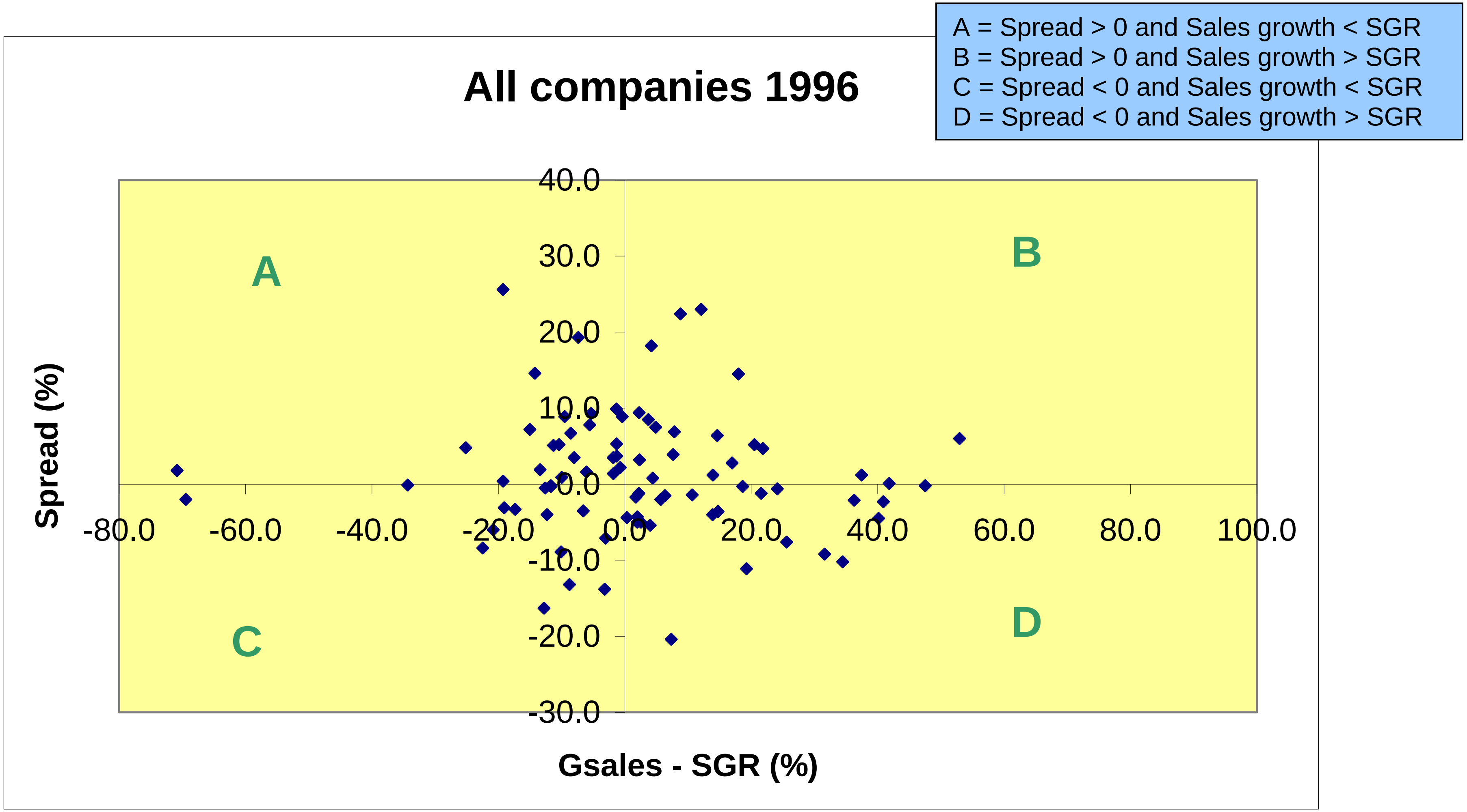


FIGURE 7.15: Results all companies 1997

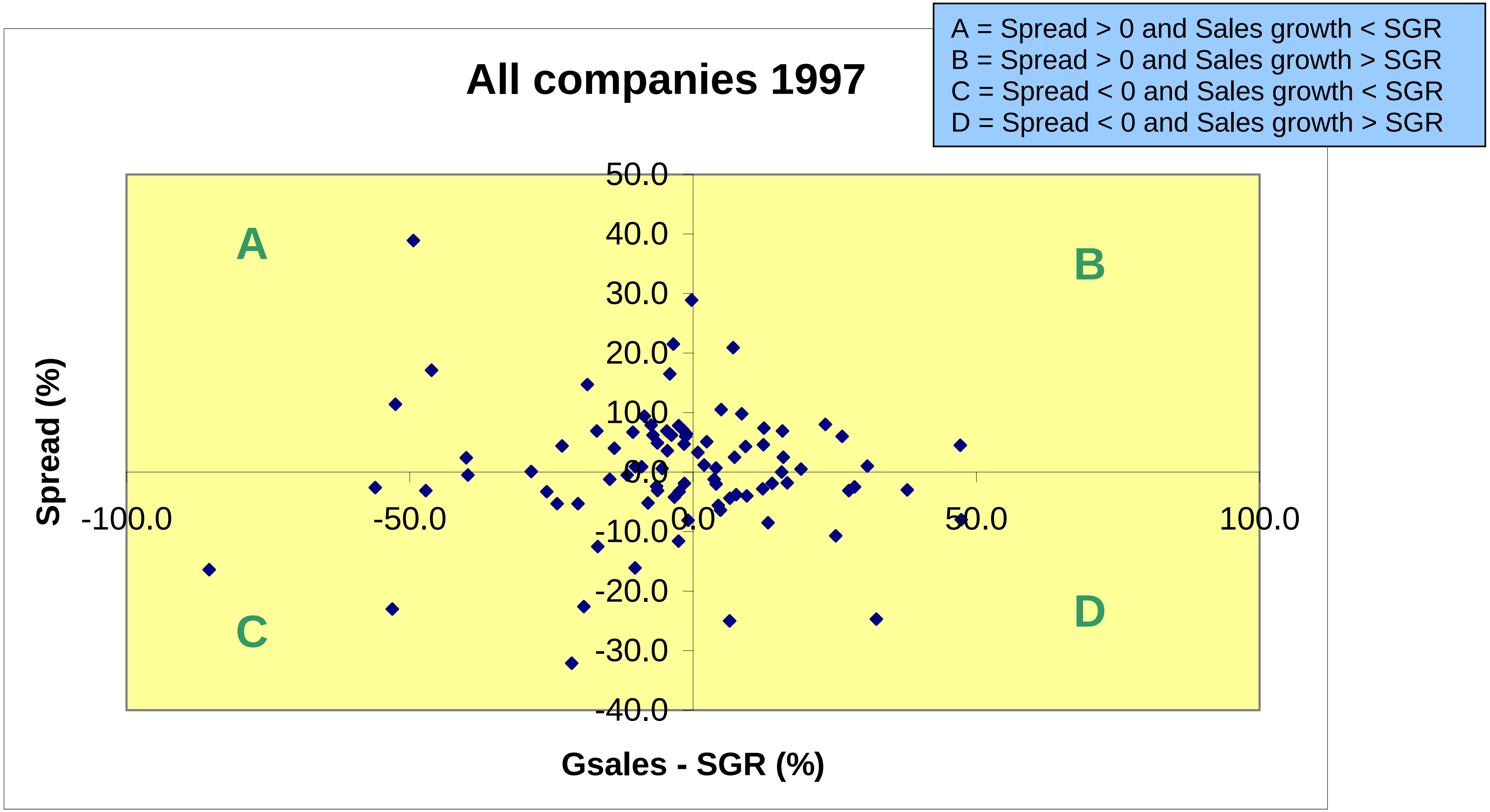


FIGURE 7.16: Results all companies 1998

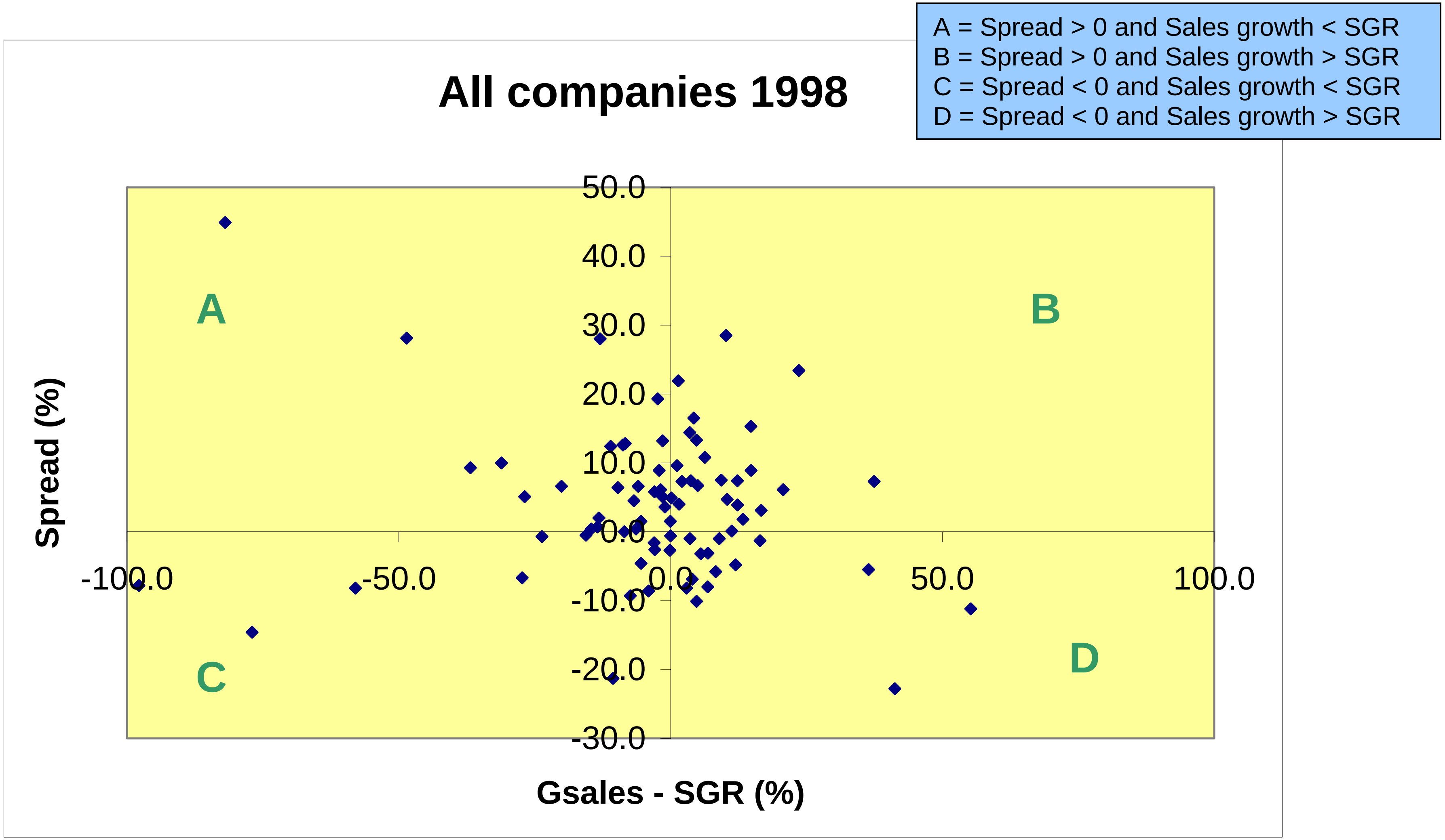


FIGURE 7.17: Results all companies 1999

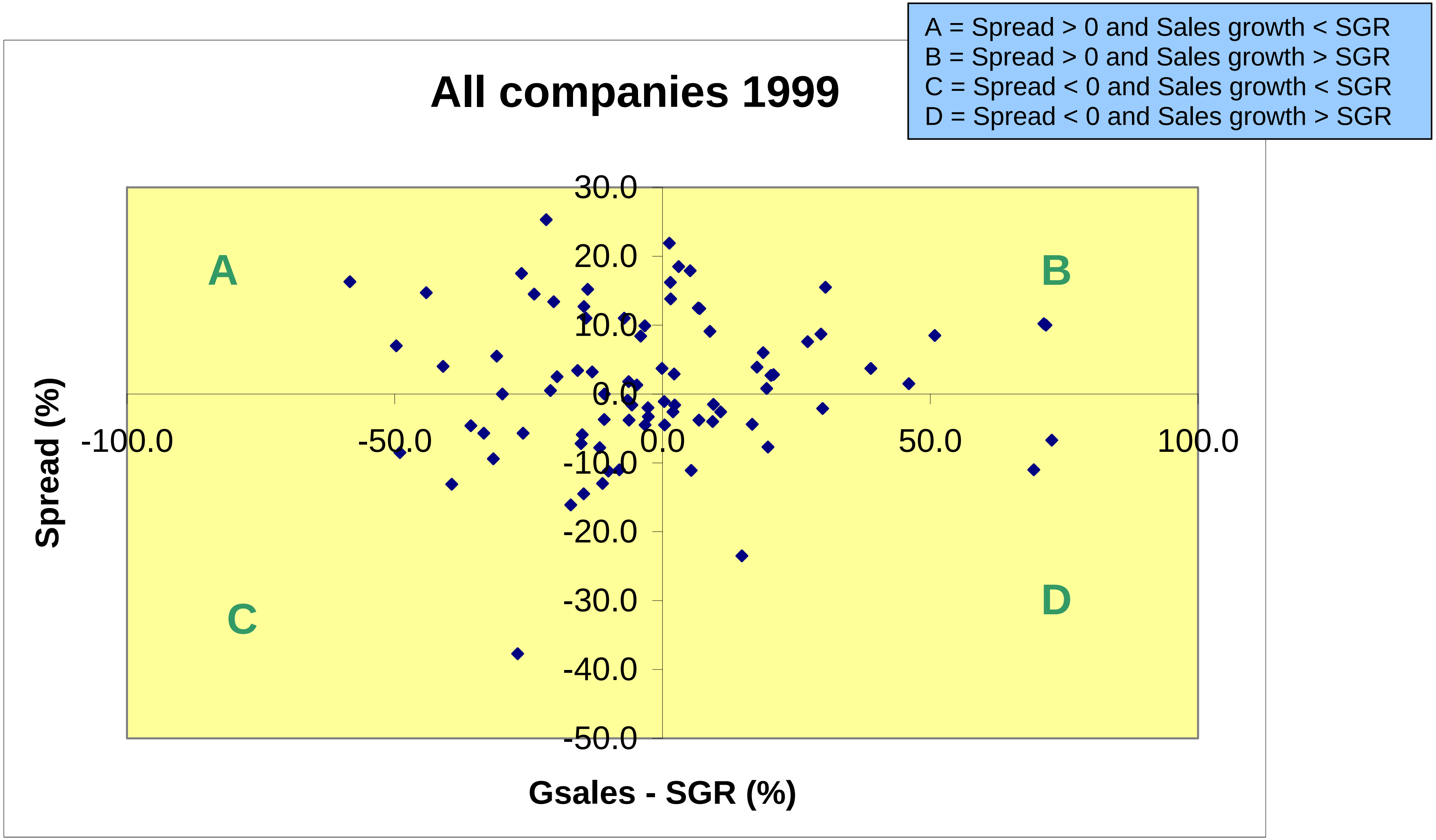


FIGURE 7.18: Results all companies 2000

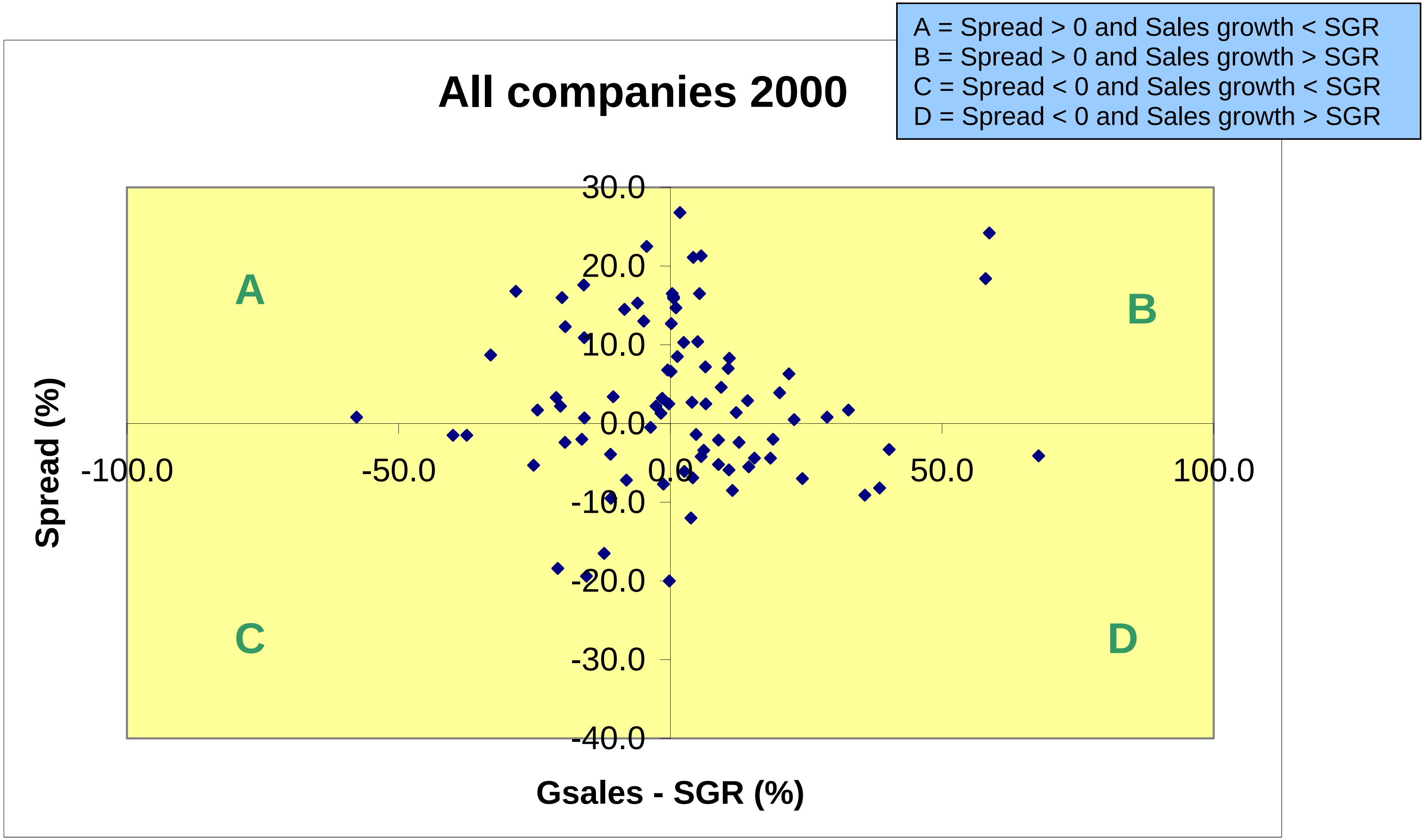


FIGURE 7.19: Results all companies 2001

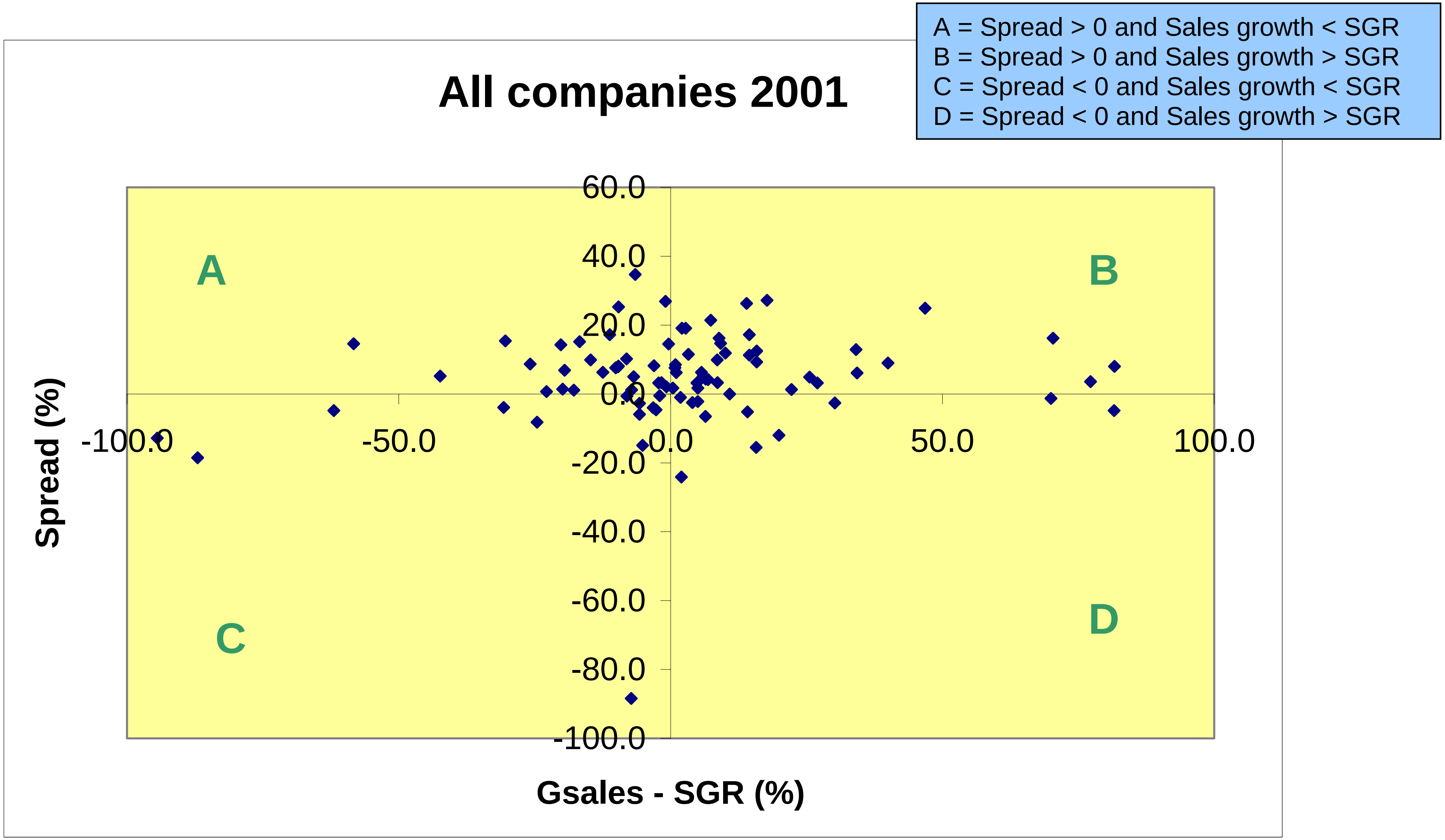


FIGURE 7.20: Results all companies 2002

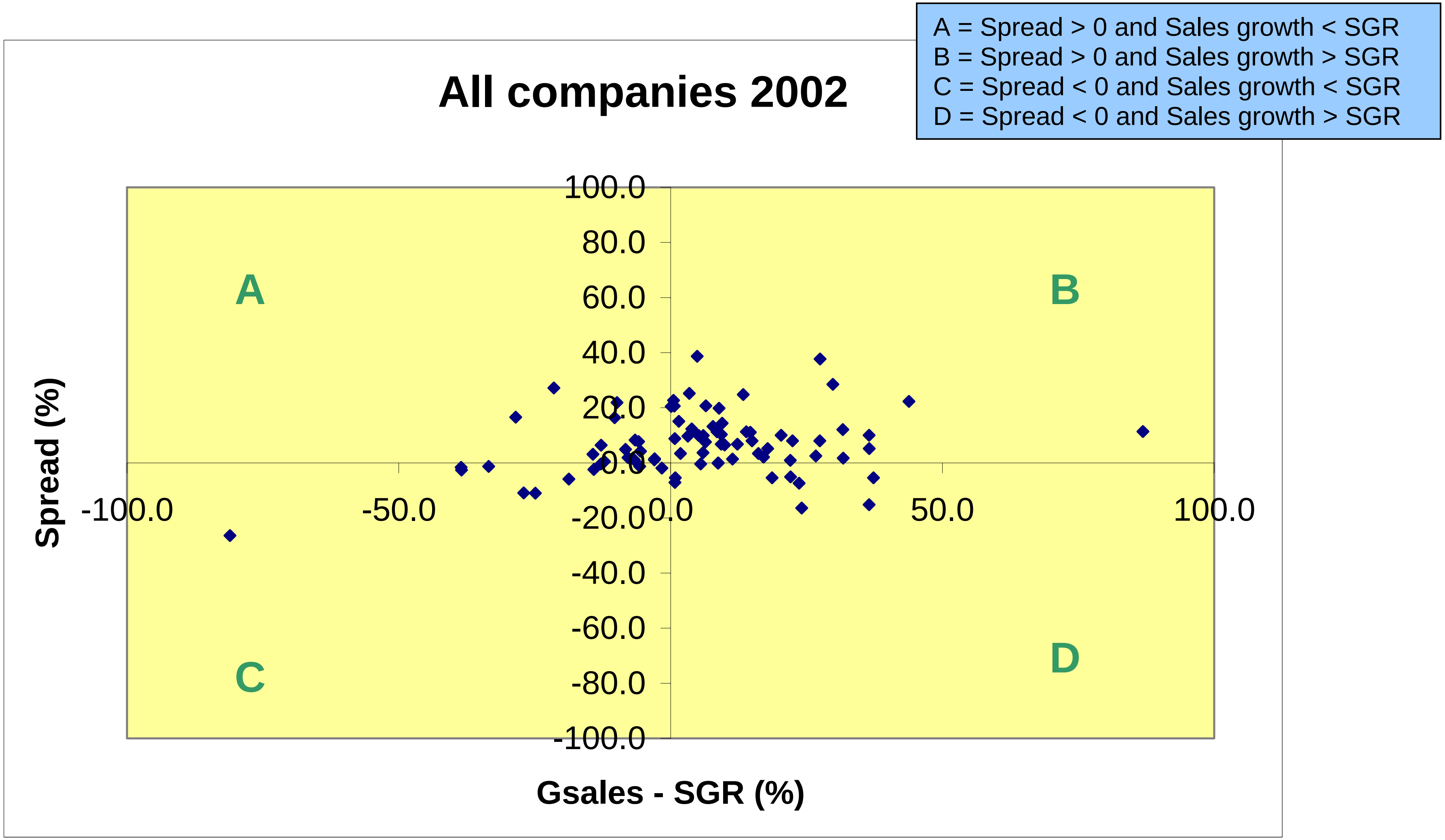
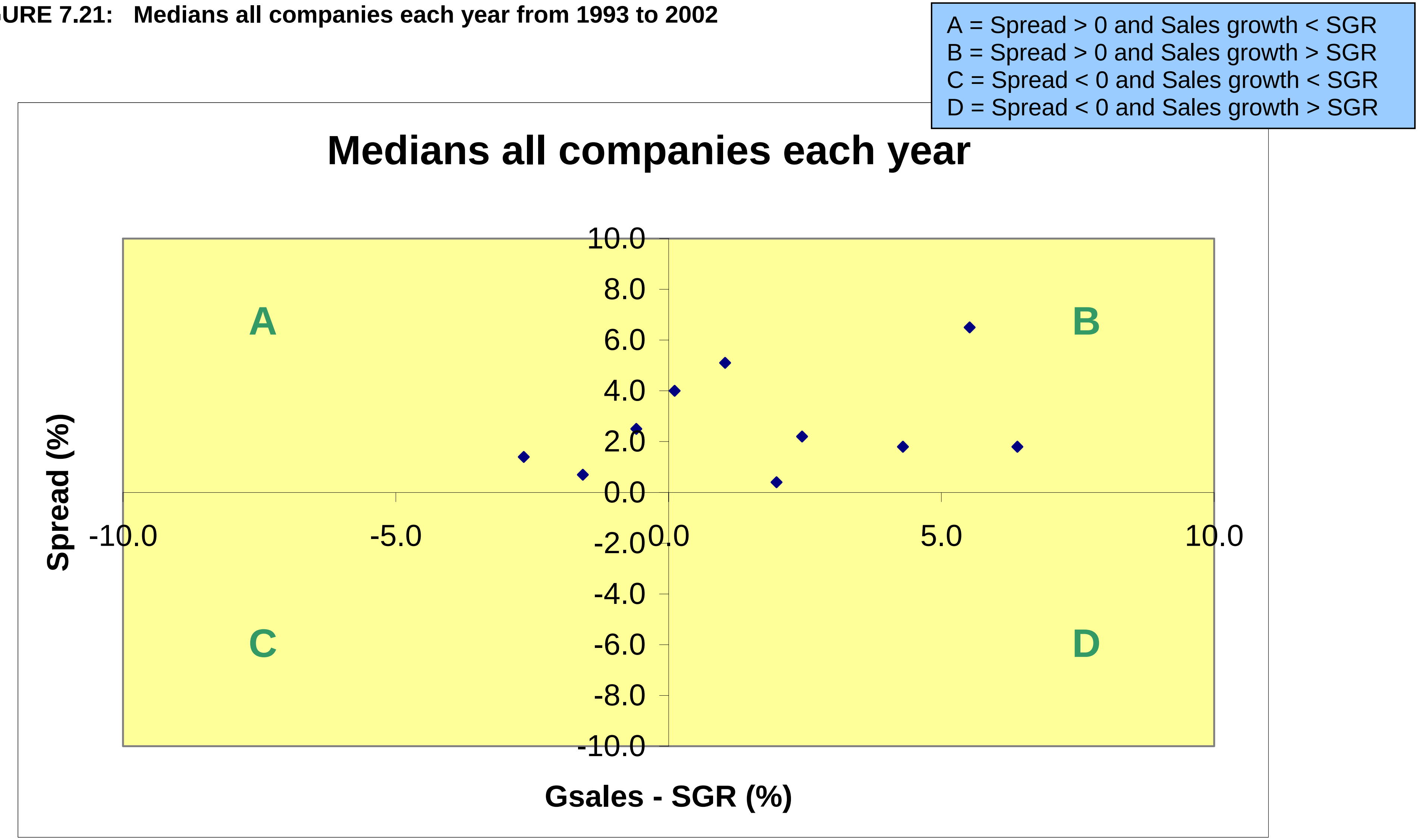


FIGURE 7.21: Medians all companies each year from 1993 to 2002



In order to allow comparison between individual companies, sectors and all companies, the median results for all companies are presented for the periods 1993 to 1997 (in Figure 7.22), 1998 to 2002 (in Figure 7.23) and 1993 to 2002 (in Figure 7.24).

7.5.4 Summary of results of sub-sectors for three periods

Figure 7.22 shows that the median spreads for all companies for the five-year period from 1993 to 1998 were more or less evenly distributed around zero, with perhaps a few more positive spreads than negative ones. The majority of companies had median sales growth minus SGR percentages that are positive. In comparison, the results for the five-year period from 1998 to 2002 show that a clear majority of companies had positive median spreads. For this period also, there were more companies with a positive sales growth minus SGR percentage than ones with a negative percentage. Figure 7.24 shows the results for the full ten-year period from 1993 to 2002 and therefore reflects a situation that "averages" the results of Figure 7.22 and Figure 7.23.

The next three graphs (contained in Figure 7.25, Figure 7.26 and Figure 7.27) show a comparison of the three individual companies selected relative to the sub-sector and all companies.

7.5.5 Summary of results comparing company to sector to all companies

In Figure 7.25 the results of Pick'nPay (a "good performer") are compared to the results of Sub-sector 21 and the median for all companies for the periods 2002; 1993 to 1997; 1998 to 2002 and 1993 to 2002. It shows that Pick'nPay outperforms all other companies by far and that its performance is very similar to that of its sub-sector.

In Figure 7.26 the same comparison is done for the company Conafex (a "bad performer"). It indicates that the individual performance of Conafex was significantly worse than that of the sub-sector and the performance of all companies for all four periods.

Figure 7.27 shows the results of an “average performer”, Ellerine, compared to the sub-sector and all companies. It is clear that Ellerine had lower spreads than both the sub-sector and all companies. It is interesting to note that the results of Ellerine are categorized in the A quadrant for all four periods. This again highlights the need to investigate further the question about how much value the market attaches to sales growth relative to the SGR.

The last three graphs, Figure 7.28, Figure 7.29 and Figure 7.30, show a comparison of the results of the three companies selected relative to the sub-sectors in which they operate, for each year from 1993 to 2002. Figure 7.28 shows that Pick’nPay performed more or less in line with the sector medians over the ten-year period from 1993 to 2002. It must be borne in mind that there was only one other company in the sub-sector, namely Shoprite, and that the performance of these two companies were both outstanding over the period under review.

Figure 7.29 shows that the performance of Conafex was consistently worse (in terms of spread) than the median for its sub-sector for each year from 1993 to 2002. The sales growth minus SGR percentage of Conafex was also more widely dispersed than that of the sub-sector for the ten years to 2002. In Figure 7.30 the results of the “average performing” company, Ellerine, compared to its sub-sector show that the company underperformed the sub-sector in general, even though Ellerine had higher spreads than the sub-sector in 1994 and 1997.

FIGURE 7.22: Medians all companies each year from 1993 to 1997

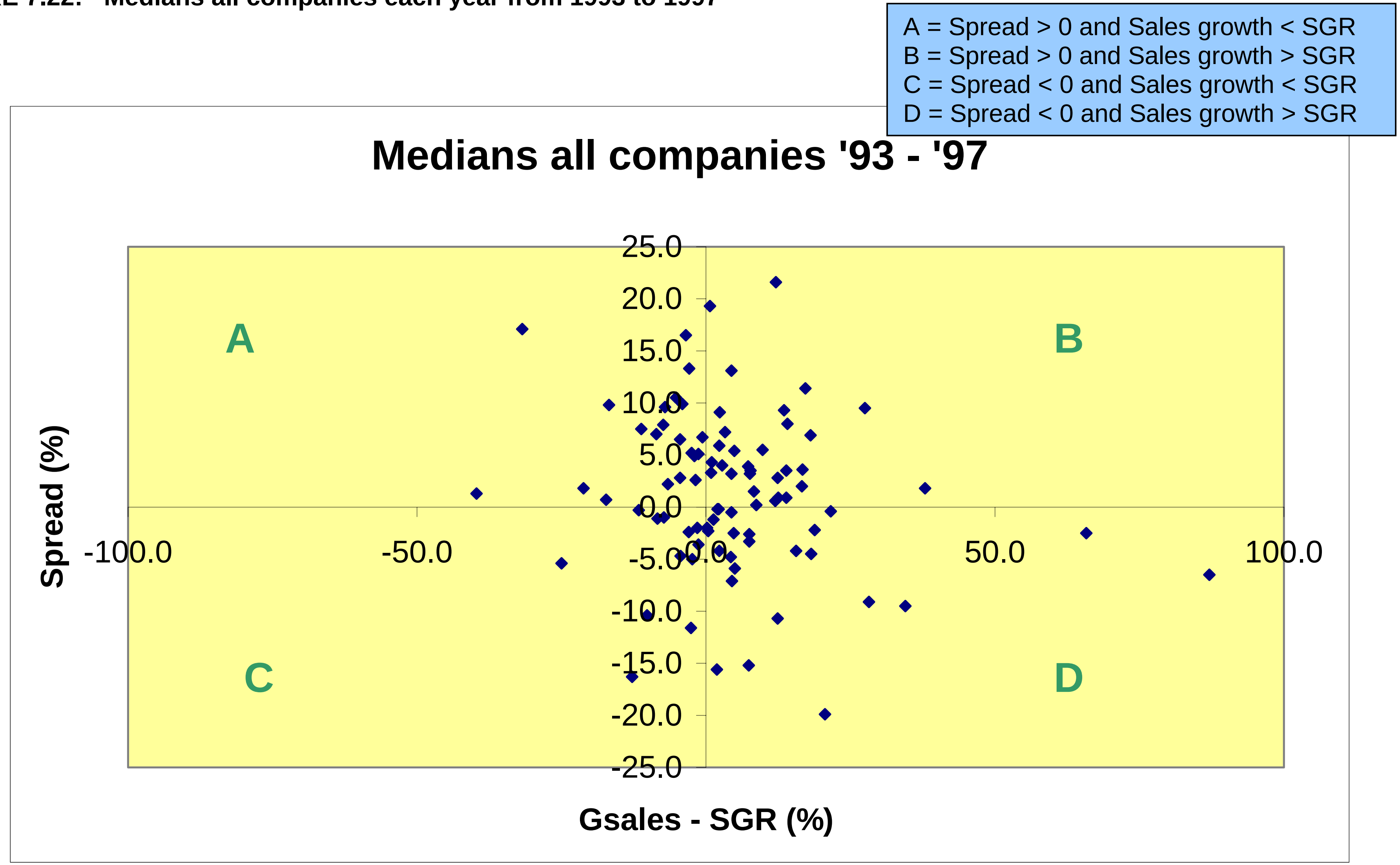


FIGURE 7.23: Medians all companies each year from 1998 to 2002

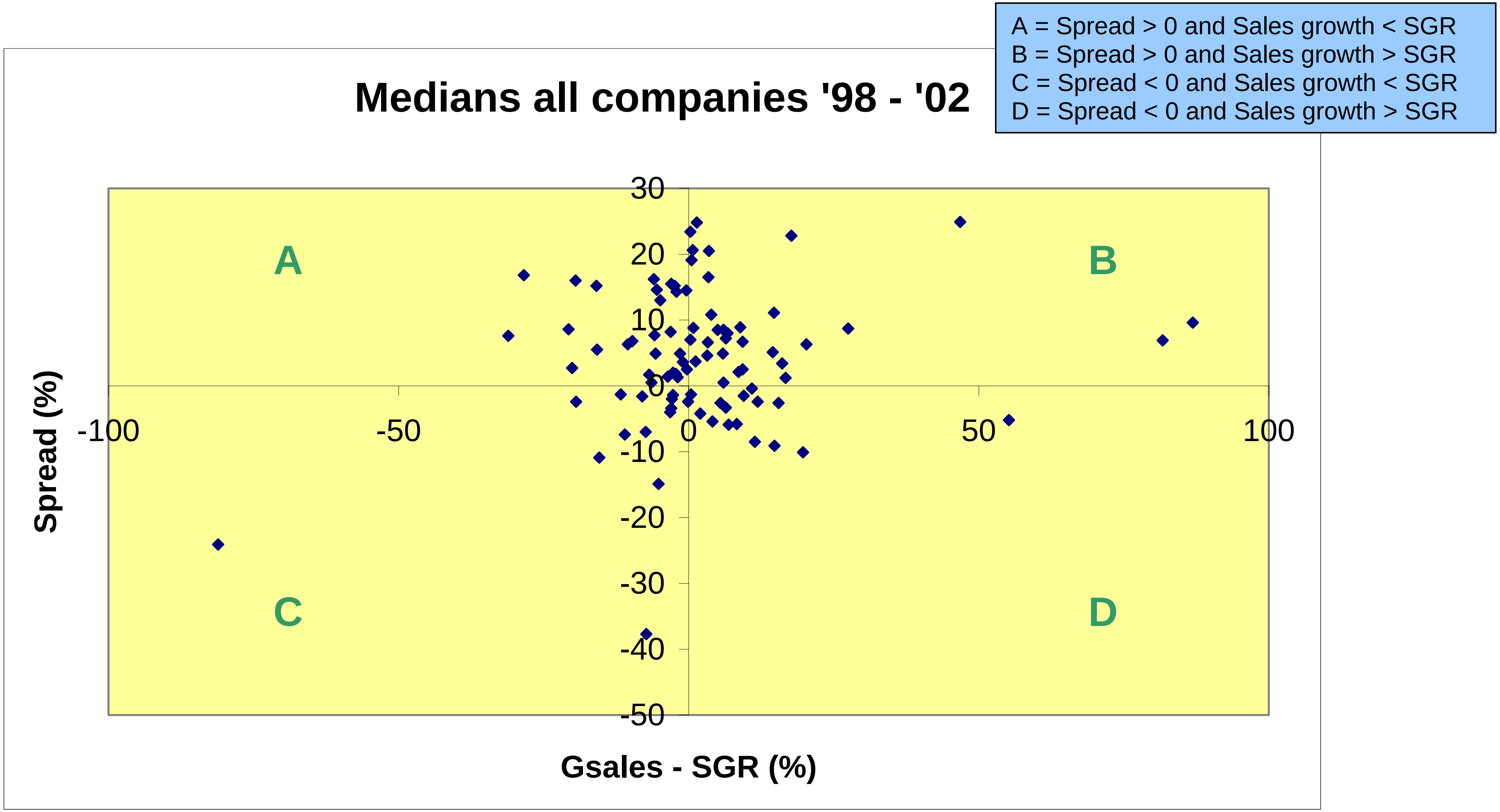


FIGURE 7.24: Medians all companies each year from 1993 to 2002

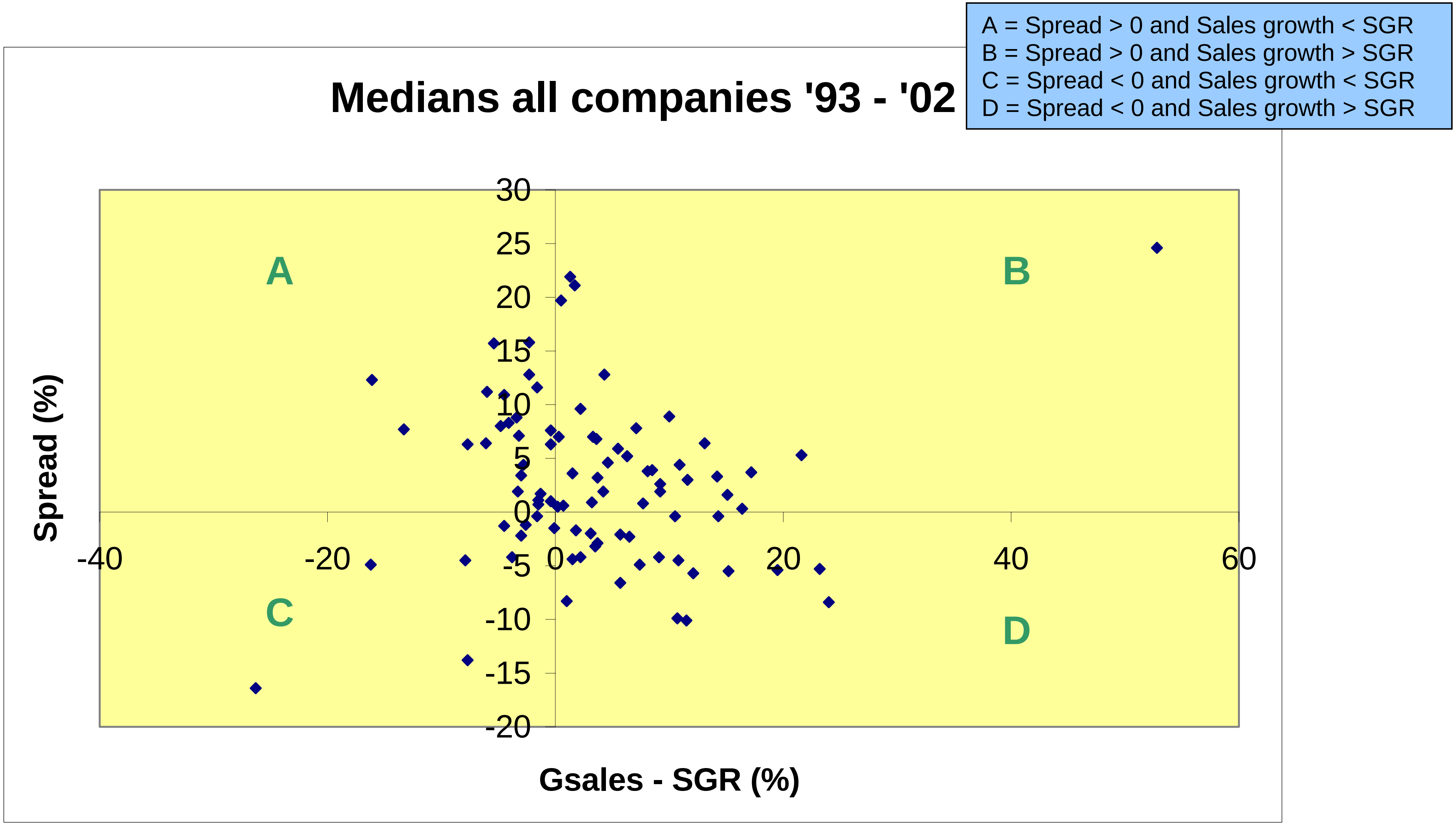


FIGURE 7.25: Pick'nPay vs. Sector 21 and all companies

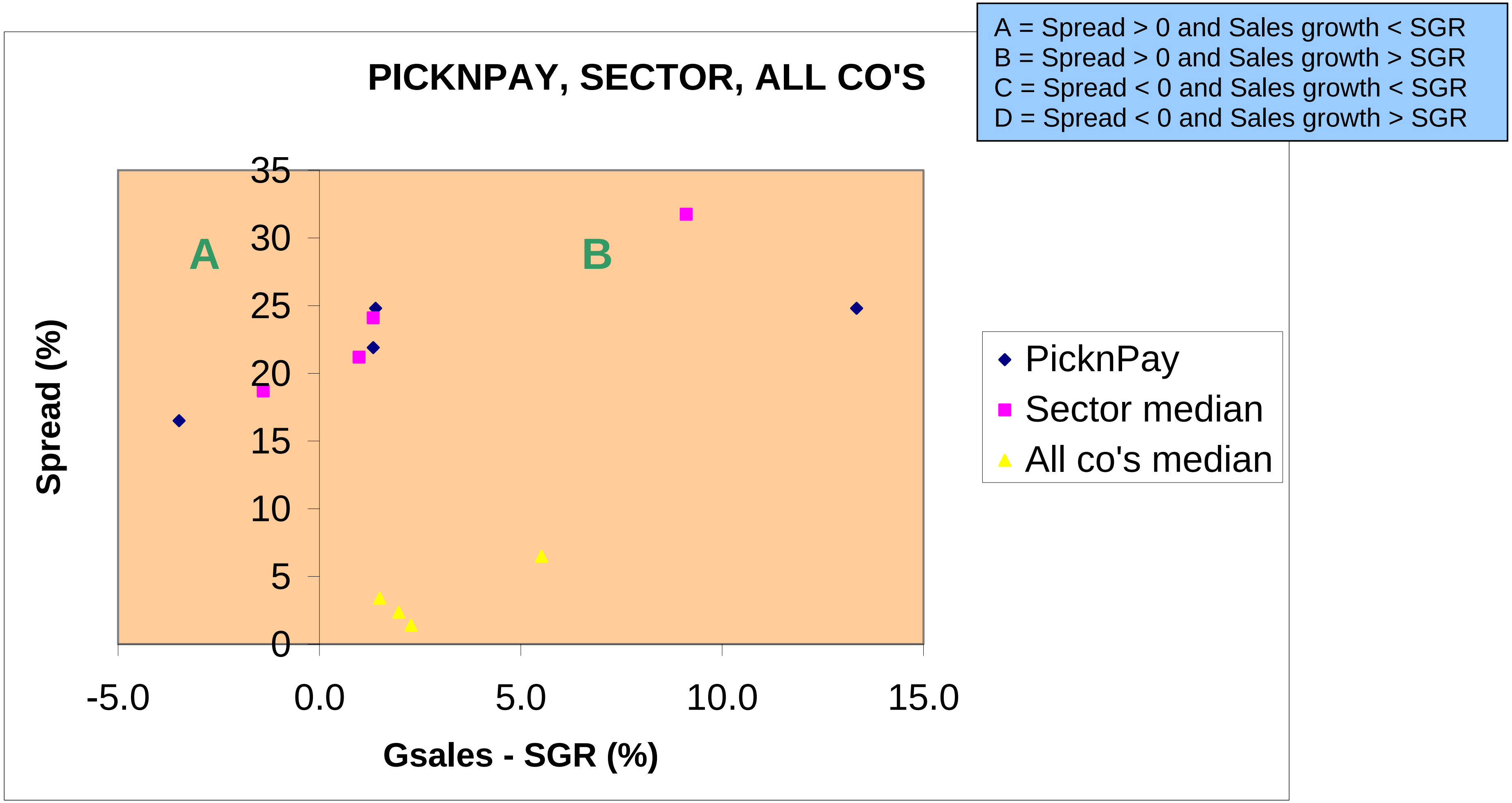


FIGURE 7.26: Conafex vs. Sector 7 and all companies

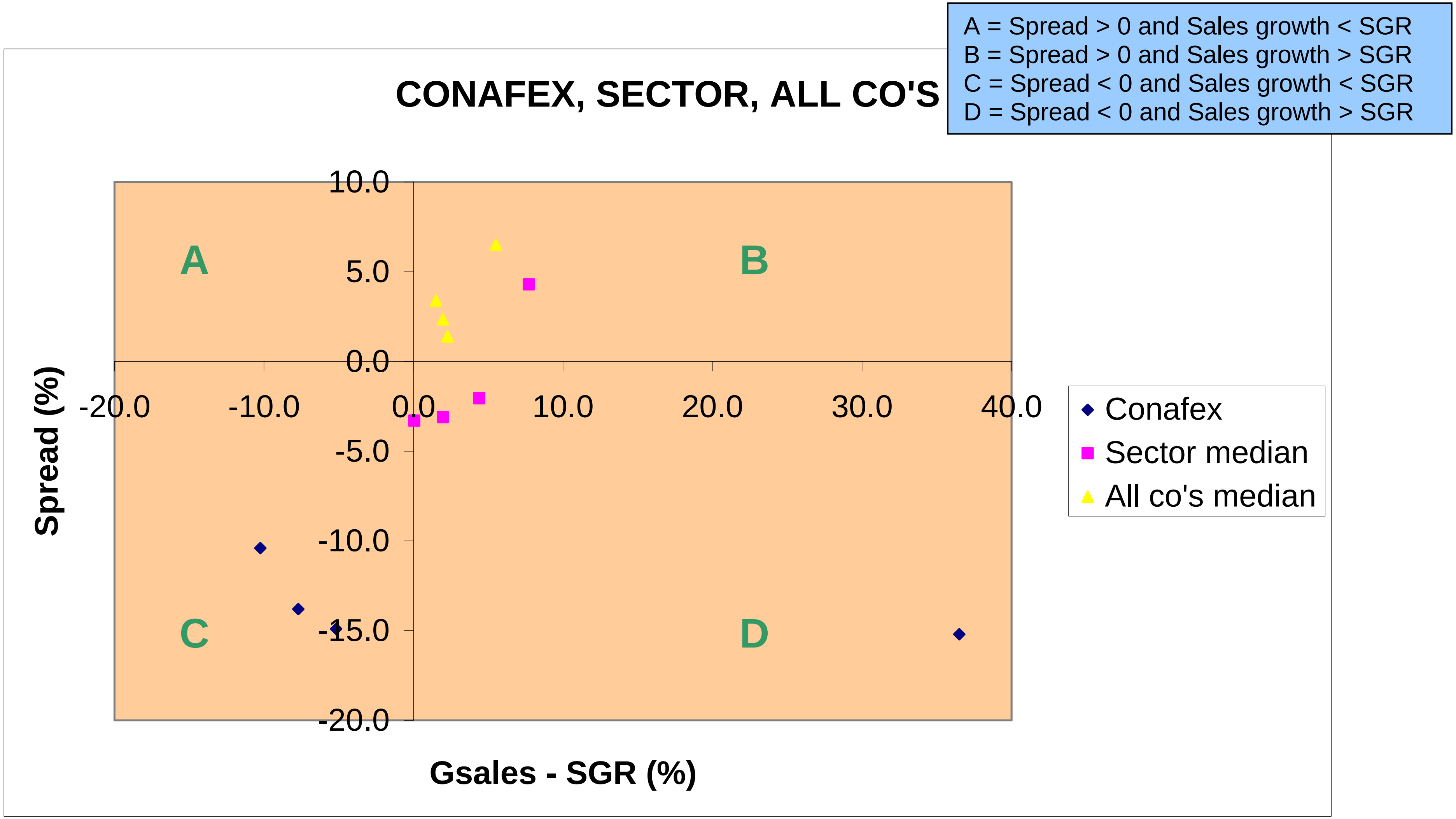


FIGURE 7.27: Ellerine vs. Sector 12 and all companies

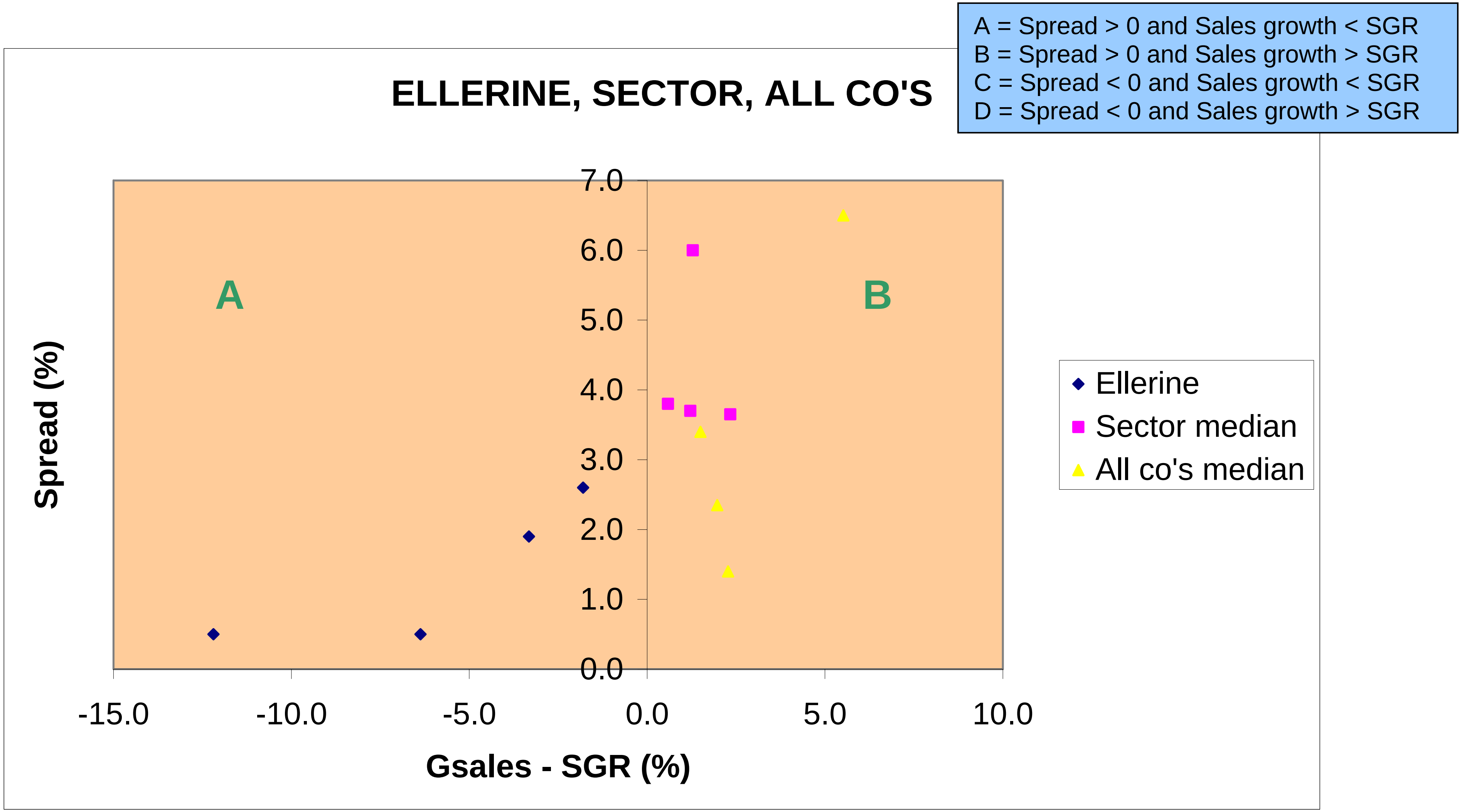


FIGURE 7.28: Pick'nPay vs. Sector 21 each year from 1993 to 2002

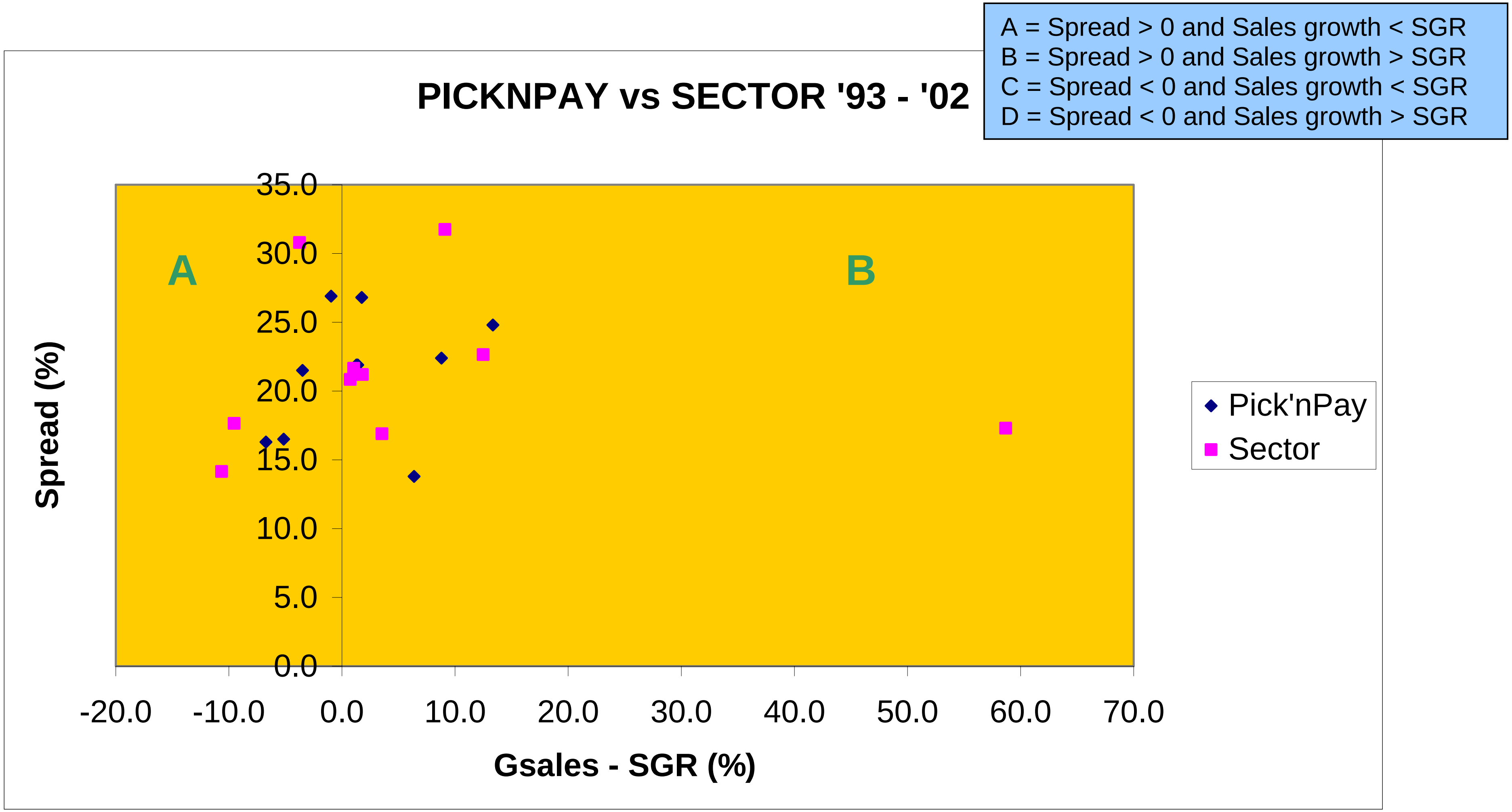


FIGURE 7.29: Conafex vs. Sector 7 each year from 1993 to 2002

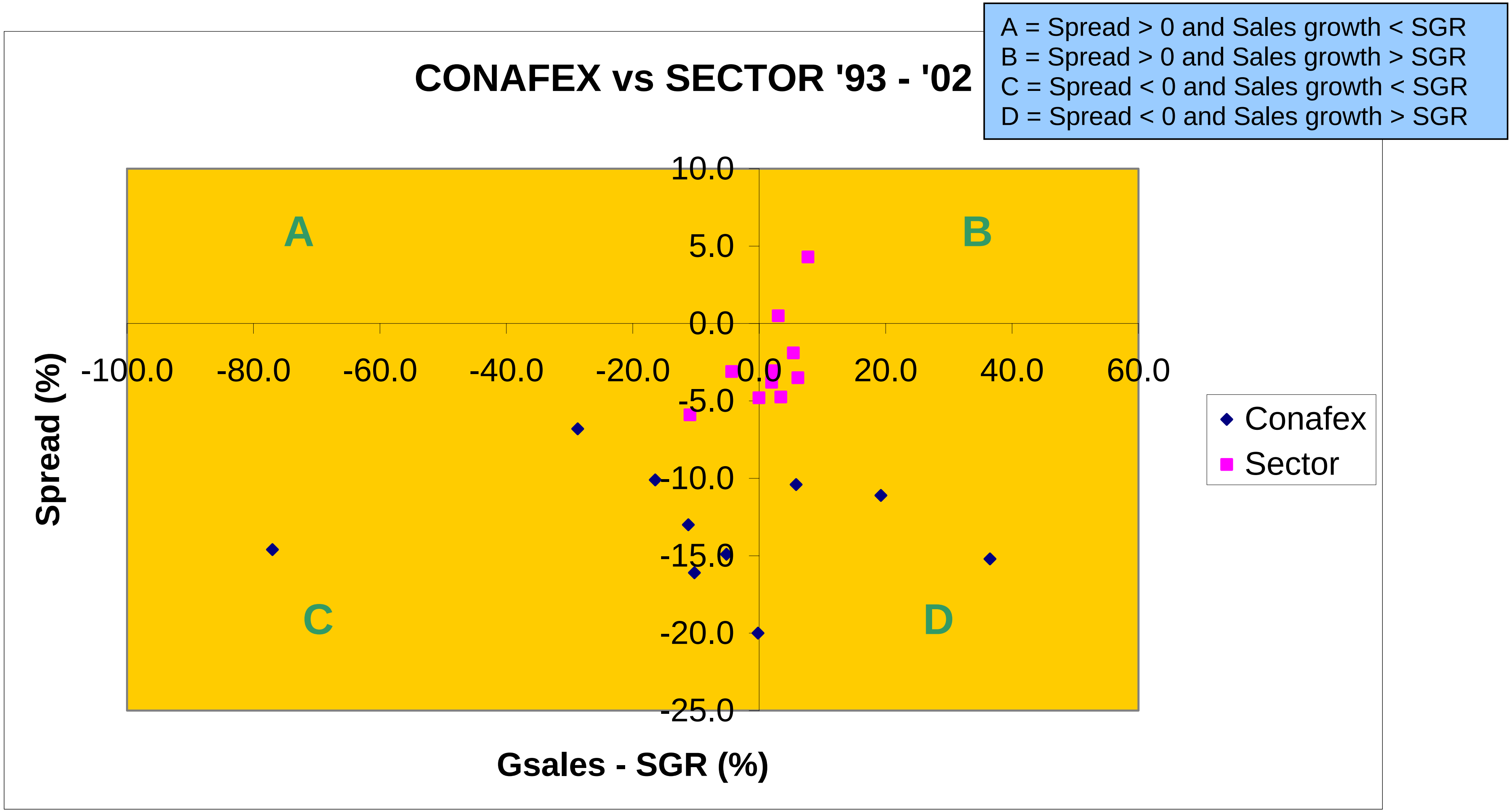
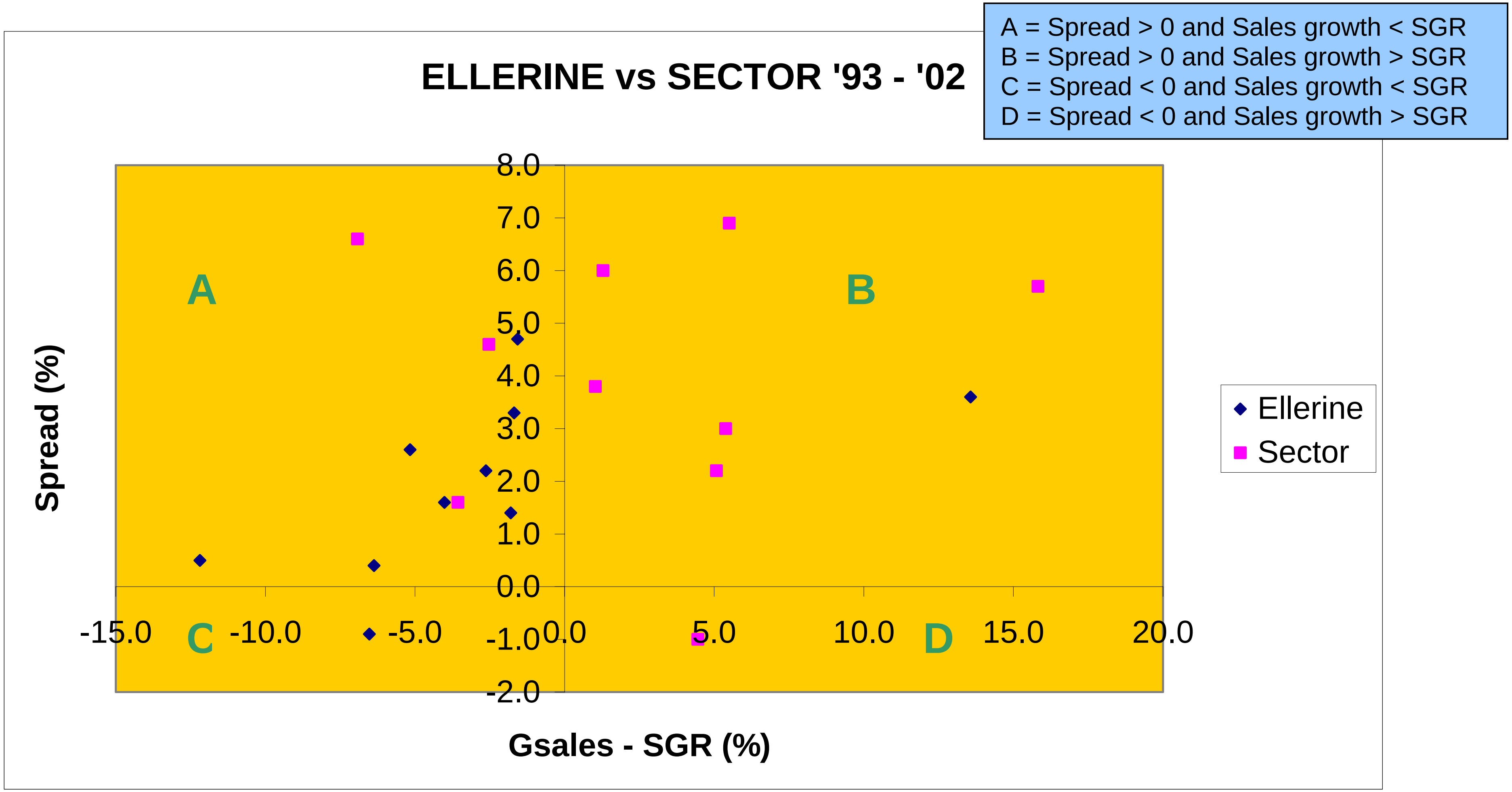


FIGURE 7.30: Ellerine vs. Sector 12 each year from 1993 to 2002



7.6 CONCLUSION

The ranking of companies was done in terms of spreads for four periods, namely the year 2002, the five years from 1993 to 1997, the five years from 1998 to 2002 and the ten years from 1993 to 2002. It is notable that some companies like Pick'nPay and Shoprite remained in the top ten rankings for all four periods and some like Conafex and Rainbow Chickens stayed in the "worst ten" category. This indicates that some companies that deliver outstanding performance do so consistently and that some that perform poorly also do so consistently.

The rankings also highlighted the big movers like MNet Supersport and Aspen (both up) and Brandcorp and Edcon (both down). It also indicated an upward-sloping trend in terms of spreads over time from 1993 to 2002.

The placement of companies, sub-sectors and all company medians on the financial strategy matrix revealed that a company could very seldom be categorized in only one quadrant for each of the ten years from 1993 to 2002. The reason for this is mostly because of the varying nature of the sales growth minus the SGR percentage, which could be positive in one year and negative in the next.

The placement of the individual companies on the matrix revealed the consistent good performance of Pick'nPay in terms of spread. It also indicated that the company moved between the A quadrant and the B quadrant on account of a positive or negative sales growth minus the SGR percentage. Conafex, the "bad performance" company, had low spreads and low sales growth and consequently was categorized in the C quadrant for most of the ten years from 1993 to 2002. Ellerine, the "average" company had relatively low to average spreads, but was still placed in the A quadrant for eight out of the ten years.

The placement of the results per sector and the comparison between sectors show that the food and drug-retailing sector (Sector 21) had median spreads dramatically higher than the other sectors for the whole period from 1993 to 2002. The median spread of Sector 21 was above 20% for 1993 to 2002, while the second best sectors had a median spread of below 10%. For the period from 1993 to 2002, the majority of sectors had positive median sales growth minus SGR percentages (18 out of 23 sectors).

The placement of all companies in the matrix highlighted some notable issues. The first is that the majority of companies had positive, rather than negative spreads each year from 1993 to 2002. There is an increasing trend over time in terms of spreads. The median sales growth minus the SGR percentage for all companies was positive for seven years and negative for three years. This indicates that cumulative cash shortages may be a problem. However, this percentage may be an unreliable measure of cash generation/shortfalls because the SGR does not take into account sales growth because of new investment in assets financed with new issues of debt or equity.

The comparison of individual company results with that of the sector and all companies immediately reveals the performance of any given company compared to the benchmarks set by the sector in which it operates and the median of all companies. From the analysis of the results placed in the financial strategy matrix, it looks as if the most successful companies are those with the highest spreads. Due to the varying nature of the sales growth minus the SGR percentage, it is not clear how much this measure contributes to the value of the company and this aspect needs to be investigated further.

The next chapter discusses the statistical tests performed to test the strength of the financial strategy matrix model and the relationship between MVA and the main drivers of EVA.

CHAPTER 8

STATISTICAL TESTS OF THE VALIDITY OF THE FINANCIAL MATRIX MODEL AND THE MAIN DRIVERS OF EVA

8.1 INTRODUCTION

In the preceding chapter, specific companies, sectors and all companies as a group were placed on the financial strategy matrix in order to determine trends over time as well as appropriate future financial strategies, given a certain position on the matrix. This chapter discusses the results of statistical tests and regressions used to test what impact the two performance measures used for the financial strategy matrix (spreads and sales growth minus the SGR percentage) have on shareholder value.

Linear regression analysis was used to determine the impact of the main components (drivers) of EVA on MVA and changes in MVA. If they can identify the specific drivers that have the biggest impact on MVA, this will enable financial managers to narrow down their focus to those drivers that will unlock and increase the most value for shareholders.

From the outset it must be borne in mind that MVA and changes in MVA are external measures that are affected by external factors (to a very large extent) and also by internal factors, for instance, EVA and sales growth. Shareholders' expectations affect MVA and changes in MVA dramatically and therefore changes in the environment, such as political instability, have a vast effect on these measures. Consequently, it is to be expected that the impact of internal factors does not carry very much weight, especially in the short term.

8.2 THE IMPACT OF SPREADS AND SALES GROWTH MINUS THE SGR PERCENTAGE ON MVA AND CHANGES IN MVA

The goal of this statistical test was to assess the impact of spreads and the differential of sales growth minus the SGR percentage on MVA. Bearing in mind that both spreads and sales growth minus the SGR percentage are single-year, *relative* measures of performance, compared to MVA, which is a cumulative, *absolute* measure of performance, it was decided to replace MVA with a related, relative measure of performance for the purposes of the regression analysis.

The first proxy measure used in place of MVA was the "growth differential", which is discussed in Section 8.2.1. The correlations of other proxies for MVA were also tested relative to spreads and sales growth minus the SGR percentage. In Section 8.2.2, the regression results are shown when the change in MVA (over the last year) is used in place of MVA. Section 8.2.3 contains the results of the regression analysis when the change in MVA divided by the IC (at the beginning of the year) is used.

8.2.1 Regression of spreads and sales growth minus the SGR percentage relative to the "growth differentials"

The measure chosen to replace MVA is the difference between the "implied expected growth in EVA" and the historical growth in EVA. The "implied expected growth in EVA" is based on the market's expectation (as reflected by the independently determined MVA) of the current EVA and the future growth in the EVA of a company. This approach is analogous to the price-implied expectations (PIE) approach used by Rappaport and Mauboussin (2001:70).

In a nutshell, the PIE approach of Rappaport and Mauboussin (2001:70) entails using the information content of the market value of a share in conjunction with free cash flow projections to estimate the implied number of years it will take for the present value of the expected future cash flows to be equal to the market value of the company. The resulting number of years is then considered to determine whether the current share price represents reasonable value or not.

The following formula can be used as a basis for determining the "implied growth rate":

$$MVA = EVA\,(1 + g_i) / (WACC - g_i)$$

where

g_i = the implied expected future constant growth rate in EVA

When the MVA, EVA and WACC of a company is known (has been calculated), g_i can be determined by changing the formula, by multiplying the terms across as follows:

$$EVA + EVAg_i = MVA \times WACC - MVAg_i$$

$$EVAg_i + MVAg_i = MVA \times WACC - EVA$$

$$g_i(EVA + MVA) = MVA \times WACC - EVA$$

$$g_i = (MVA \times WACC - EVA)/(EVA + MVA)$$

When the historical growth rate in EVA is deduced from this "implied expected future growth rate", the difference is expected to be smaller for companies that are considered good performers (and bigger for those that are considered not to be good performers). A survey of the data for the listed companies included in the final database indicates that for the majority of these companies, the historical growth rate in EVA over the last number of years (1993 to 2002) was, with very few exceptions, consistently higher than the "implied expected growth rate".

Intuitively, this makes sense, because the market, as reflected by the MVA, is unlikely to expect EVA to keep on growing at the same rate as the most recent historical growth rate, and it is also unrealistic to expect this EVA growth to continue indefinitely in future. This view of the market aligns with the strategic perspective that, all other things being equal, the competitive advantage of a company is eroded over time as new competitors enter the market.

Therefore, if a linear regression is done between this "growth differential" and spreads, it is to be expected that there will be a negative correlation for companies performing well and a smaller, negative correlation for companies that are not performing well.

The "growth differential" for Pick'nPay, at the end of 2002 is calculated as follows:

Implied expected EVA growth rate:

MVA = EVA $(1 + g_i)/(\text{WACC} – g_i)$

4 467,027 = 215,69 $(1 + g_i)/(0{,}141 – g_i)$

g_i = 8,8%

Historical EVA growth rate:

g_h = $(\text{EVA}_{2002}/\text{EVA}_{1993})^{1/9} – 1$

= 22,0%

"growth differential" = $g_h - g_i$

= 13,2%

The formula used for the calculation of the historical growth rate in EVA gave the same answer as the geometrical mean return (Keller and Warrack, 2000:100, Bodie, Kane and Marcus, 2003:133). Only companies with positive spreads in 2002 were used for this analysis. The reason for this is that it was expected that higher spreads would be reflected as higher values (and therefore lower "growth differentials"). For companies with negative spreads, this expectation does not arise.

Furthermore, only companies that had positive spreads (and EVAs) for a sufficient number of years (a minimum of five years), so that a credible historical growth rate in EVA could be calculated, were included in the group of companies for this regression analysis. After eliminating some companies according to these criteria, only 30 companies remained (out of the initial 89). The names of the 30 companies, as well as the relevant information for each one, are set out in Table 8.1 overleaf.

Table 8.1: Spreads and sales growth minus the SGR percentages relative to "growth differentials"

						A	B	A - B
						Historical	Implied ex-	
				Gsales	5 yr median	EVA	pected future	
No	Company	Year	Spread	- SGR	Gsales-SGR	growth	EVA growth	Difference
			%	%	%	%	%	%
1	**SHOPRIT**	2002	38.7	4.9	0.3	30.1	-1.1	31.2
2	**MNET-SS**	2002	28.5	29.8	46.8	29.8	-2.1	32.0
3	**ALTECH**	2002	27.2	-21.5	-3.0	56.5	-2.6	59.0
4	**PICKNPAY**	2002	24.8	13.3	1.4	17.8	4.0	13.8
5	**BOWCALF**	2002	22.7	0.5	0.5	31.3	-9.1	40.4
6	**CMH**	2002	21.9	-9.9	-6.0	35.5	-24.4	59.9
7	**DELTA**	2002	20.7	6.5	-4.9	35.9	1.8	34.1
8	**OCEANA**	2002	20.6	0.7	0.7	23.1	0.0	23.1
9	**CERAMIC**	2002	20.5	0.1	3.5	24.5	5.1	19.4
10	**ITLTILE**	2002	19.8	8.9	-2.1	60.5	3.0	57.5
11	**TIGBRANDS**	2002	16.6	-28.5	-15.9	18.7	0.2	18.6
12	**BEARMAN**	2002	16.4	-10.3	6.4	25.0	-22.9	47.8
13	**UNITRAN**	2002	15.1	1.5	5.0	34.3	-47.9	82.2
14	**CHEMSVE**	2002	14.4	9.5	-15.8	42.6	-1.0	43.6
15	**METCASH**	2002	11.4	86.9	86.9	31.1	1.1	30.0
16	**AHEALTH**	2002	11.3	13.9	14.5	53.0	-5.3	58.3
17	**WBHO**	2002	11.3	8.5	-2.4	27.2	-90.7	118.0
18	**BIDVEST**	2002	11.1	14.7	14.7	55.8	7.7	48.1
19	**REUNERT**	2002	10.3	9.3	-0.4	4.9	8.2	-3.3
20	**SASOL**	2002	10	20.3	20.3	104.0	-6.1	110.1
21	**NUCLICKS**	2002	9.9	6.0	6.0	30.1	-0.1	30.2
22	**MEDCLIN**	2002	9.7	3.2	3.2	42.5	-7.7	50.2
23	**MRPRICE**	2002	8.8	0.8	0.8	38.7	-34.9	73.6
24	**HUDACO**	2002	8	22.4	-10.5	5.1	-8.3	13.4
25	**PPC**	2002	8	27.5	-1.0	21.6	-1.1	22.7
26	**ABI**	2002	7.7	-5.9	-5.9	22.0	8.8	13.1
27	**AFROX**	2002	6.8	9.3	9.3	23.7	2.6	21.1
28	**IMPERIAL**	2002	3.4	16.1	16.1	42.4	-4.5	46.9
29	**NAMPAK**	2002	2.5	26.7	-3.1	-1.1	4.6	-5.7
30	**CAXTON**	2002	1.1	-3.0	-6.8	-0.9	-1.6	0.7

For the purpose of the regression analysis, the 30 companies were divided into two groups of 15 each, namely the top 15 and 16 to 30. With regard to the regression between the spreads and the growth differential, it was anticipated that the top 15 would show a larger negative correlation than the second group of 16 to 30. The regression results showed a correlation coefficient of –0,166 for the top 15 group. For the 16 to 30 group, there was a positive correlation between the spreads and the growth differential, with a correlation coefficient of +0,535. This result was quite different from what was expected (namely a smaller, negative correlation coefficient). Based on these results, one could still assert that higher spreads go with higher value (and lower growth differentials) in the case of the companies with the higher spreads (the top 15). It is hard to explain why there was a positive correlation between spreads and growth differentials for the second group of companies (16 to 30).

As a next step, a regression was done of the sales growth minus the SGR percentage and the growth differentials of each company, again using the two groups indicated above. It was expected that there would be little correlation between these two variables, even if the financial matrix model suggests that sales growth above the SGR percentage would cause cash shortages and that this may have a negative impact on the value of a business.

For the top 15 companies, the correlation coefficient was –0,189, which indicates that the higher the sales growth minus the SGR percentage, the lower the growth differential (and therefore the higher the value). This result is the opposite of what was implied in the financial strategy matrix model. However, a possible reason for this could be that high sales, in spite of their negative impact on cash flows, also lead to higher spreads and in that way also contribute to higher value.

For the 16 to 30 group of companies, the correlation coefficient of the same variables was insignificantly small. This is opposed to the underlying theory of the financial strategy model, but it does strengthen the hypothesis that the difference between sales growth and the SGR percentage for a given year does not play a large part in determining the value of a company.

In order to guard against dismissing the impact of controlled sales growth on the value of the business too easily, it was decided also to do a regression analysis between the growth differential and a five-year median for sales growth minus the SGR percentage. This would show whether the sales growth relative to the SGR percentage does indeed play a role in value determination, if not for a given year, then perhaps over a period of time.

For the top 15 companies, the correlation coefficient was –0,136, which is not very different from the result for the regression of sales growth minus the SGR percentage for a given year. For the 16 to 30 group of companies, the correlation coefficient was +0,487. This result was surprising, because it indicates that higher sales growth minus the SGR percentage goes with higher growth differentials (and lower value). On its own, it supports the financial strategy model, but compared to the same regression for the top 15 group, it does not give a clear signal regarding the impact of sales growth relative to the SGR percentage on the value of a company.

Using the “growth differential” as a measure of value may have some shortcomings, which, under certain circumstances, could provide unreliable results. For instance, if the historical growth in EVA starts off strongly and then tapers off or even becomes negative in later years, the “average” historical growth rate in EVA over the whole period will be low. When this is compared to the “implied expected growth rate”, the difference may be small. The low “growth differential” may be wrongly interpreted as “high value”. This phenomenon may also account for the significant positive correlation between the spreads and the “growth differentials” of the group of companies with the lower spreads (the 16 to 30 group).

8.2.2 Regression of spreads and sales growth minus the SGR percentage relative to changes in MVA

Finding an appropriate, reliable indicator of value against which the spreads and sales growth minus the SGR percentage can be correlated is not a straightforward exercise. In order to overcome the limitations of using only one measure of value, two other measures were used as well. A regression was done using the (one-year) “change in MVA” instead of the “growth differential” as a measure of value. This time, all the data for the 89 companies for the nine-year period from 1994 to 2002 were used (1993 was the first year and because only changes were taken into account, the 1993 data was discarded). After the data had been sorted according to spreads, only data pertaining to positive spreads were retained. The 499 data observations with positive spreads were divided into two groups, namely the top 250 and the 251 to 499 groups.

In this instance, one would expect that there would be a positive correlation between changes in MVA and spreads and that the correlation would be stronger for the companies with higher spreads. For both the sales growth minus the SGR percentage and the five-year median sales growth minus the SGR percentage, it was expected that there would be a low correlation, and if anything, that it would be negative (indicating that the higher the sales growth is above the SGR, the weaker the cash control and therefore the lower the value).

The results were the following: the correlation coefficient of the regression between the change in MVA and the spreads was –0,3135 for the top 250. This negative correlation is opposite to what was expected. For the 249 to 499 group the correlation coefficient was –0,0552. From this result it is impossible to tell whether spreads influence value positively (the opposite seems to be the case). It is also not possible to infer that the values of companies with higher spreads are influenced more by their spreads than those with lower spreads.

The results of the regression between the changes in MVA and the sales growth minus the SGR percentage as well as that between the changes in MVA and the five-year median sales growth minus the SGR percentage were very low, in fact, almost insignificant, correlations. For the top 250, the correlation coefficient (for the change in MVA and sales growth minus the SGR percentage) was +0,0391 and for the 251 to 499 it was –0,0008, indicating very low levels of correlation and little difference between companies with high spreads and those with low spreads. The correlation coefficient for the regression between the changes in MVA and the five-year median sales growth minus the SGR percentage was +0,0622 for the Top 250 group and –0,0926 for the 251 to 499 group. The results were not very different when the actual sales growth minus the SGR percentage for a given year was used as opposed to when the five-year median was used.

8.2.3 Regression of spreads and sales growth minus the SGR percentage relative to changes in MVA divided by IC

Using the change in MVA, rather than the amount of MVA, eliminated the cumulative effect of the MVA measure. To go one step further, it was decided to divide the change in MVA by the IC at the beginning of the year in order to have a relative measure of value, expressed as a factor. The expectations regarding the regressions between the changes in MVA divided by IC and the spreads (and sales growth minus the SGR percentage) are mainly the same as those for the changes in MVA, as stated in Section 8.2.2. The only difference in the expectations was that there would be a better correlation with spreads this time (better than in the case of changes in MVA).

The results of the regressions were the following: the correlation coefficient for the regression between the changes in MVA divided by IC and the spreads was –0,0408 for the top 250 group. The slightly negative correlation was again contrary to expectation. For the 251 to 499 group, it was –0,1085, which is hardly significant. The difference of the results between the two groups was negligible.

The regression of the change in the MVA divided by the IC and the sales growth minus the SGR percentage showed very little significance. The correlation coefficient was +0,0351 for the top 250 group and +0,0009 for the 251 to 499 group. When the five-year median sales growth minus the SGR percentage was used, the regression results were not very different. For the top 250 group, it was +0,0753 and for the 251 to 499 group it was +0,0132.

The general conclusion drawn from the regressions (done at a 5% significance level) discussed above is that neither spreads nor sales growth minus the SGR percentages had a significant impact on the measures used for value (MVA, changes in MVA and changes in MVA divided by IC) on a year-on-year basis. The implication of this is that the usefulness of the financial strategy matrix as a financial management tool can be questioned, especially if it is used only for the results of one specific year. Further investigation would be required to ascertain whether there are better causal relationships (between spreads and value, for instance) with more statistical significance if values are determined over a longer period, for instance, five or ten years.

8.3 REGRESSION OF MVA AND THE MAIN DRIVERS OF EVA

In this section, the impact of each of the main drivers of EVA on MVA was investigated. MVA and two other variations of MVA, namely MVA divided by the IC at the beginning of the year (MVA/IC_{beg}) and the changes in MVA during the year (Change in MVA) were used for the purposes of the regression. These regression results, as well as the results of regression using EVA and MVA over longer periods than one year, are discussed below.

It must be considered from the outset that MVA is an external measure of value that is affected by a range of different factors. Therefore it was expected that although EVA and its drivers do influence the MVA over time, the effect on a year-on-year basis would not be very significant. The amount of MVA is actually determined by the present value of expected future EVAs, discounted at an appropriate risk-adjusted WACC. Due to the fact that for the calculation of the change in MVA and the growth in EVA no values could be determined for the first year (1993), only the values over the nine-year period (1994 to 2002) were used in respect of all the variables for this regression exercise.

8.3.1 Regression of MVA and EVA and the main drivers of EVA

The values for MVA are determined independently, based on the market values of shares and loans. Theoretically, the MVA of a company can also be determined by calculating the present value of all expected future EVAs, discounted at the WACC. If it is furthermore assumed that the future growth rate in EVA will be constant, the following formula can be used to determine the main drivers of EVA. These drivers of EVA are also the independent variables (x) in the regression analysis, while MVA is the dependent variable (y):

MVA = EVA $(1 + g_i) / (WACC - g_i)$

MVA = Performance spread x IC_{beg} x $(1 + g) / (WACC - g_i)$

MVA = $\{(ROIC - WACC) \times IC_{beg} \times (1 + g)\} / (WACC - g_i)$

MVA = $[\{EBIT/Sales \times Sales/IC_{beg} \times (1 - t) - WACC\} \times IC_{beg} \times$

$(1 + g)] / (WACC - g)$

Simple linear regression was done using first EVA as the independent variable and then each of the following independent variables (one at a time, relative to MVA):

- EBIT/Sales;
- Sales/IC_{beg};
- t (the cash tax rate);
- WACC;
- g (the expected future growth in EVA); and
- IC_{beg}.

Note that the historical year-on-year growth in EVA was used as a proxy for the expected future growth rate in EVA.

Sales were included as a further independent variable in order to test their impact on MVA. Variables for which correlation coefficients significant at a 5% level were calculated are indicated by * in the following tables. The full results of the regression (indicated as correlation coefficients, “r”) are set out in Table 8.2 below.

Table 8.2: Regression 1 – MVA relative to EVA and the main drivers of EVA

Variables	All data		EVA pos.		EVA neg.
EVA	0.04493		0.08277		-0.05836
EBIT/Sales	0.02522		0.05517		0.02499
Sales/IC	-0.00095		-0.01650		0.10171
tax rate	*0.10365		*0.09748		*0.09308
WACC	*0.11405		*0.15262		*0.10392
g	0.00141		0.03243		-0.04526
IC_{beg}	*0.22598		*0.53814		0.01224
Sales	*0.41277		*0.58459		*0.31052

* Significant at a 5% level

All the companies in the final database (89) were sorted in terms of spreads and the regression was performed on three groups, namely the results for all years and for all companies, then the results for the years in which companies had positive spreads and then the results for the years in which companies had negative spreads. It was expected that there would be very little correlation between EVA (and its drivers) and MVA for the years in which companies had negative spreads. It is clear that the correlation coefficients were weak, even for the years when companies had positive spreads.

The low level of correlation between EVA and MVA on a year-on-year basis for the period from 1994 to 2002 was disappointing. The correlation coefficient was only 0,083 for the years when companies had positive spreads and 0,045 for all companies and all the years. This result fails to back up claims by Stern (1993:36) of a high correlation between EVA and MVA (an r^2 of 50%) found for a sample of American companies.

As far as the drivers of EVA are concerned, none showed any significant correlation with MVA, except IC_{beg}, with a correlation coefficient of +0,538 (an r^2 of 29%) for the years when companies had positive spreads and +0,226 for all companies and all the years. The second best correlation coefficient was the +0,153 for the WACC, but one would expect this coefficient to be negative due to the notion that higher WACCs should lead to lower MVAs.

To add an additional test, the correlation between sales and MVA was tested and the result of +0,585 (an r^2 of 34%) for the years when companies had positive spreads (and +0,226 for all the companies and all the years) indicates a strong relationship between sales and MVA. The general conclusion about the regression of MVA and the drivers of EVA (as well as EVA itself) is that the linear relationships are weak and not significant, except for IC_{beg}.

8.3.2 Regression of MVA/IC_{beg} and the spreads and the main drivers of EVA

Due to the weak relationship between MVA and the drivers of EVA, it was decided to use other versions of MVA, in this case, MVA/IC_{beg}, to see whether better correlations could be found. Based on the point of view that the drivers of EVA are mostly ratios and percentages (except for IC_{beg}), it makes sense to use a ratio for the dependent variable as well. When MVA is divided by IC_{beg}, the absolute value of MVA becomes a relative value that can be compared for companies of all sizes. In fact, taking the original equation and dividing by IC_{beg} on both sides results in the following variables:

$$\text{MVA} = \text{Performance spread} \times IC_{beg} \times (1 + g) / (\text{WACC} - g_i)$$

$$\text{MVA} = [\{\text{EBIT/Sales} \times \text{Sales}/IC_{beg} \times (1 - t) - \text{WACC}\} \times IC_{beg} \times (1 + g)] / (\text{WACC} - g)$$

If one divides by IC_{beg} on both sides of the equal sign, one gets the following equation:

$$MVA/IC_{beg} = Spread\ (1 + g) / (WACC - g)$$

$$MVA/IC_{beg} = [\{EBIT/Sales \times Sales/IC_{beg} \times (1 - t) - WACC\} \times (1 + g)] / (WACC - g)$$

The last equation shows the independent variables that were used for this regression, namely:

- EBIT/Sales
- Sales/IC_{beg}
- t (the cash tax rate)
- WACC
- g

The correlation results are set out in Table 8.3.

Table 8.3: Regression 2 – MVA/IC_{beg} relative to the spreads and the drivers of EVA

Variables	All data		EVA pos.		EVA neg.
Spread	0.00662		-0.02707		0.01424
EBIT/Sales	0.01103		0.01141		0.12100
Sales/IC	*0.98488		*0.98768		*0.29649
tax rate	0.03285		0.03074		0.07533
WACC	-0.04597		-0.08085		*0.30107
g	0.00303		0.00282		-0.01915

* Significant at a 5% level

This regression provided a surprising result. The relationship between spreads and MVA/IC_{beg} was almost non-existent, with a correlation coefficient of –0,027 for the years when companies had positive spreads and +0,007 for all companies and all the years. The correlation coefficient of the relationship between Sales/IC and MVA/IC_{beg} was a remarkable +0,988 (an r^2 of 98%) for the years when companies had positive spreads and +0,985 for all companies and all years. This extremely high level of correlation could be due to the fact that both the dependent variable and the independent variable had been divided by the amount of IC at the beginning of the year.

It is also interesting to note that the correlation is not nearly as high for the years when companies had negative spreads (an r of +0,296). The only other correlation coefficient worth mentioning is the –0,081 (for the years when companies had positive spreads) for the WACC. This level of correlation is not really significant, but at least the negative sign indicates that value is affected adversely when the WACC goes up (as it should be).

8.3.3 Regression of change in MVA and EVA and the main drivers of EVA

The last variable used to represent value in the regression analysis was the change in MVA for any given year. This adjustment overcame the problem that arises from the fact that MVA is a cumulative measure, calculated from the inception of a company, while EVA is an annual amount. It has been recognized that changes in MVA over the period of one year would be volatile due to many impacting factors and that the relationships between the changes in MVA and the internal drivers of value and are not expected to be strong.

The same dependent variables that were used for regression 1 (using MVA as the dependent variable) were employed for this regression. The results are set out in Table 8.4 overleaf.

Table 8.4: Regression 3 – Change in MVA relative to EVA and the main drivers of EVA

Variables	**All data**		**EVA pos.**		**EVA neg.**
EVA	-0.12433		-0.29789		-0.04152
EBIT/Sales	0.01012		-0.10277		0.01516
Sales/IC	0.00231		0.00370		0.03129
tax rate	0.05220		0.08199		0.04945
WACC	0.05420		0.06310		0.05407
g	0.01079		0.08913		-0.05459
IC_{beg}	0.04881		0.07455		0.04230
Sales	*0.10053		*0.18160		0.08412

* Significant at a 5% level

The results of this regression were, as in the case of regression 1, disappointing. The correlation coefficient for the change in the MVA regressed against the EVA was negative (-0,298 for the years when companies had positive spreads and – 0,124 for all companies and all years). For none of the independent variables tested was the correlation coefficient higher than +0,100, indicating very weak relationships. The correlation coefficient for sales and changes in MVA was +0,182 for the years when companies had positive spreads and +0,101 for all companies and all years.

Apart from Regression 2, which showed very high correlation between sales/IC_{beg} and MVA/IC_{beg}, the relationships between all the independent variables tested and the dependent variable representing value proved to be weak. It must be borne in mind that these regressions were done on a year-on-year basis. This raised the question whether there would be better correlations if regressions were done over longer periods. The results of such regressions are described in the next section.

8.3.4 Regression over periods longer than one year

Considering that the results of the year-on-year regression of MVA and EVA, as well as MVA and the main drivers of EVA showed weak relationships in general, it was decided to test the relationship between changes in MVA and the sum of EVA over longer periods. Because the required data was only available for nine full years, two four-year periods, namely the first from 1994 to 1997 and the second from 1999 to 2002, were chosen.

The idea was also to test whether EVA lagged behind MVA (in other words, whether current EVA only affects future MVA), or whether MVA lagged behind EVA (in other words, whether current MVA reflects future EVA). It was expected that the latter view (MVA lagging EVA) was more likely to show significant relationships.

Added to the two four-year periods, regression was also done for the full nine-year period from 1994 to 2002, as well as for the seven years from 1995 to 2002. The results of these regressions are set out in Table 8.5 overleaf.

Table 8.5: Regression of MVA relative to EVA over periods longer than one year

Regression 4 (Change MVA 1994 to 1997 and total EVA 1994 to 1997)						
		All data		**EVA pos.**		**EVA neg.**
		*0.24818		*0.44999		0.06827
Regression 5 (Change MVA 1994 to 1997 and total EVA 1999 to 2002)						
		*0.22982		*0.26964		-0.56740
Regression 6 (Change MVA 1999 to 2002 and total EVA 1994 to 1997)						
		-0.02365		-0.43423		*0.10579
Regression 7 (Change MVA 1999 to 2002 and total EVA 1999 to 2002)						
		-0.03535		0.06831		-0.27433
Regression 8 (Change MVA 1994 to 2002 and total EVA 1994 to 2002)						
		0.07840		*0.23477		0.08564
Regression 9 (Change MVA 1995 - 2001 and total EVA 1995 - 2001)						
		*0.16750		*0.41319		*0.16171

* Significant at a 5% level

The results of the regression of changes in MVA and the sum of the EVA over the four years from 1994 to 1997 (Regression 4) revealed a correlation coefficient of +0,450 (an r^2 of 0,203) for companies that had positive EVAs in 2002 and +0,248 for all companies for all the years. This relationship can be considered as reasonably significant, indicating that about 20% of the change in MVA can be explained by looking at changes in the sum of EVAs for the period from 1994 to 1997 (of companies with positive EVAs in 2002).

The next regression (Regression 5) was done by comparing the change in MVA for the period from 1994 to 1997 with the sum of the EVAs for the period from 1999 to 2002. This result, compared to that of Regression 4, would show whether changes in MVA reflect EVAs for the same period better or EVAs for a future period. The correlation coefficient for companies with positive EVAs in 2002 was +0,270 and +0,230 for all companies for all the years. It can therefore be inferred that, at least for the periods involved, changes in MVA reflect changes in the sum of EVAs for the same period better than for a future period.

Regression 6 was done using the change in MVA for the period from 1999 to 2002 compared to the sum of the EVAs for the period from 1994 to 1997. The correlation coefficient of –0,434 for the companies with positive spreads in 2002 (and –0,024 for all companies and all years) indicates a negative relationship, which leads one to conclude that current EVA does not drive future MVA.

If one applies this analysis to the second four-year period, from 1999 to 2002 (Regression 7), the correlation coefficient for the companies that had positive spreads in 2002 was +0,068 (and –0,035 for all companies and all the years). This shows a much weaker relationship than for the period from 1994 to 1997.

If the full nine-year period from 1994 to 2002 is examined (Regression 8), the correlation coefficient is +0,235 for the companies that had positive spreads in 2002 and +0,078 for all companies and all the years. This indicates that increasing the length of the period does not lead to an improvement in the strength of the relationship between the sum of the EVAs and the change in MVA.

In order to test the relationships over a relatively stable economic period, it was decided to eliminate the years in which specific events were known to have had a large impact on economies and share prices, namely 1994 and 2002. The data for 1994 were eliminated because of the dramatic impact that the first democratic election in South Africa had on local share prices. The aftermath of the Twin

Towers disaster in New York during September 2001 had a huge impact on share prices worldwide (the most dramatic effect on share prices took place in 2002) and for this reason it was decided to eliminate 2002 as well.

Regression 9 shows the results of the correlation between the sum of EVAs and changes in MVA over the seven-year period from 1995 to 2001. The correlation coefficient for companies with positive spreads in 2002 was +0,413 (an r^2 of 0,17) and +0,166 for all companies and all the years. These results show a much stronger relationship than the nine-year period from 1994 to 2002, but the magnitude is still not close to that reported by Stern (1993:36).

8.3.5 Regression using natural logarithms

Theoretically the nature of the relationship between MVA and the main drivers of EVA is multiplicative, rather than additive. Therefore taking natural logarithms of MVA and the main drivers of EVA would transform the equation into a linear model, which would hopefully show better linear correlation results. Unfortunately the data did not allow the completion of this exercise because there were numerous negative values for EVA and MVA, making the calculation of the natural logarithms impossible. Ignoring the negative values would lead to the elimination of so much data that the results would not have been reliable.

8.3.6 Regression of median values for the period from 1993 to 2002

In an effort to determine whether better correlations can be found if short-term fluctuations are eliminated, it was decided to test the relationships between MVA, EVA and the main drivers of EVA by using the ten-year median for each variable. The results of these regressions set out in Table 8.6 overleaf.

Table 8.6: Regression of median values for MVA, EVA and the drivers of EVA for the period from 1993 to 2002

Variable	All data		EVA pos.		EVA neg.
EVA	*0.59372		*0.86861		*0.57239
EBIT/Sales	0.09536		0.00706		*0.48060
Sales/IC	0.08596		-0.01656		*0.36125
tax rate	*0.22314		0.07018		*0.49583
WACC	*0.14057		*0.20900		*0.14057
g	0.03231		-0.01451		0.05839
ICbeg	*0.34775		*0.88023		-0.02426

* Significant at a 5% level

The results indicate a strong relationship between the median MVAs and the median EVAs with a correlation coefficient of +0,869 (an r^2 of 75%) for companies with positive median EVAs and +0,594 for all companies. Only one of the main drivers of EVA showed a strong correlation that makes economic sense with MVA. This variable was the median IC_{beg} with a correlation coefficient of +0,880 (an r^2 of 77%) for companies with positive median EVAs and +0,348 for all companies.

8.3.7 Stepwise multiple linear regression

In order to determine the nature of the relationship between shareholder value and the main drivers of EVA, taken together in one multiple regression equation, the stepwise multiple regression approach was used. The first stepwise regression was done between MVA and the main drivers of EVA and the second between MVA/IC and the main drivers of EVA. The backward selection stepwise regression approach was used by eliminating terms (variables) not significant at a 5% level.

The results of the final step in the stepwise regression between MVA and the main drivers of EVA are presented in Table 8.7 and the results of the final step of the stepwise regression between MVA/IC and the main drivers of EVA are shown in Table 8.8.

Table 8.7: Final step of stepwise regression between MVA and the main drivers of EVA

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.250131759
R Square	0.062565897
Adjusted R Square	0.060216438
Standard Error	6536.601298
Observations	801

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	2	2275641306	1137820653	26.62991749	6.37322E-12
Residual	798	34096270912	42727156.53		
Total	800	36371912219			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	-221.671719	386.2102862	-0.573966378	0.566152289	-979.7792137	536.4357757	-979.7792137	536.4357757
t	5802.071811	1854.640752	3.128407377	0.001821429	2161.523891	9442.619732	2161.523891	9442.619732
ICbeg	0.314318869	0.047324009	6.641847857	5.72822E-11	0.221424694	0.407213045	0.221424694	0.407213045

Table 8.8: Final step of stepwise regression between MVA/IC and the main drivers of EVA

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.985258265
R Square	0.970733848
Adjusted R Square	0.970623687
Standard Error	3.64005123
Observations	801

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	3	350273.9671	116757.989	8811.941685	0
Residual	797	10560.22845	13.24997296		
Total	800	360834.1956			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	-4.576905523	0.741764063	-6.170298285	1.08381E-09	-6.032947006	-3.12086404	-6.032947006	-3.12086404
Sales/ICbeg	0.908694655	0.005595745	162.3902975	0	0.89771052	0.91967879	0.89771052	0.91967879
WACC	15.85588954	4.92548117	3.219155447	0.001337735	6.187444719	25.52433435	6.187444719	25.52433435
ICbeg	7.20065E-05	2.65966E-05	2.707354328	0.006927407	1.97988E-05	0.000124214	1.97988E-05	0.000124214

The final results of the stepwise regression between MVA and the main drivers of EVA shown in Table 8.7 indicate a low overall correlation of the independent variables (drivers of EVA) relative to MVA, with an r^2 of 0,063. The only two independent variables that remained in the model because they make significant contributions to the determination of the value of MVA were the taxation percentage and IC. The result does not add any new information that would be helpful in managing the drivers of EVA.

The results of the stepwise regression between MVA/IC and the main drivers of EVA shown in Table 8.8 indicated extremely high correlation of the independent variables relative to MVA/IC, with an r^2 of 0,971. The high correlation was mainly due to the variable sales/IC. Again this result does not add any new information, as the single regression between MVA/IC and sales/IC already indicated this extremely high positive correlation, which appears to be artificial because both the dependent and independent variables are divided by IC.

8.4 CONCLUSION

The aim of this chapter was, first, to describe the statistical tests used to verify the strength of the financial strategy matrix and to report on the results. Second, the strength of the relationship between MVA and EVA, and the main drivers of EVA were tested, using different versions of MVA.

For the first series of tests, the impact of spreads and sales growth minus the SGR percentage on three different measures of value were tested. The measures used to represent value were the “growth differentials”, changes in MVA and MVA/IC_{beg}. For these tests, only companies with positive spreads (and EVAs) were used, because no relationships were expected between the spreads (and sales growth minus the SGR percentage) and the market value of companies with negative spreads.

As far as the impact of spreads on the three measures of value is concerned, there were some results that indicated a positive relationship. However, when the group of companies with high spreads was compared to the group with low spreads, it was not possible to tell whether higher spreads had a bigger impact on value than lower spreads.

The relationship between sales growth minus the SGR percentage and the three measures of value proved to be very weak and almost non-existent. The reason for this may be that high sales growth may give two different signals. The one is that the high sales growth may indicate bad cash management and lead to a build-up of cash shortages (as highlighted by the financial strategy matrix). High sales growth may also be regarded as a driver for higher profits and in that way contribute to higher value. Based on this outcome, one can conclude that the sales growth minus the SGR percentage does not have a significant impact on value at all.

The relationship between MVA and EVA, as well as the main drivers of EVA, was also tested. Two other versions of MVA, namely MVA/IC_{beg} and change in MVA, were used to check whether better correlations could be found than with MVA. The data of the 89 companies were sorted according to spreads and the correlation coefficients were determined for three groups, namely positive spreads, negative spreads and all companies.

None of the relationships between EVA and the three measures for value were significant on a year-on-year basis. A slightly better correlation was found when the period was extended to four years. However, the strength of the relationship still falls far short of that reported by Finegan (1991:36) with an r^2 of 61% for MVA relative to EVA, by Stern (1993:36) with an r^2 of 50%, by Uyemura *et al.* (1996:98) with an r^2 of 40% and by Grant (1997:39) with an r^2 of 32% for different samples of American companies.

It must be noted that the American results were obtained only for companies with positive EVAs and after some averaging and clustering of data had been done. When ten-year medians are used in the regression done on the South African companies, a very strong relationship between MVA and EVA is found (an r^2 of 75%). This indicates that 75% of the changes in the (ten-year) median MVAs can be accounted for by the changes in the median EVAs. The high level of correlation is mainly due to a very significant relationship between MVA and IC_{beg}, which is a component of EVA.

The relationships found in this study between the main drivers of EVA and the measures of value on a year-on-year basis were generally not significant, but there were two exceptions. A correlation coefficient of +0,538 (an r^2 of 29%) indicated that there is a strong relationship between IC_{beg} and MVA. Furthermore, excellent correlation was found between sales/IC_{beg} and MVA/IC_{beg} (an r^2 of 98%). It indicates that asset turnover has a large impact on the relative measure of value of a company. This result must, however, be used with caution as it could be that the abnormally high correlation was caused by the fact that both dependent and independent variables were divided by IC_{beg}.

The general conclusion from the statistical tests is that the results were not significant and conclusive enough to say that the two criteria plotted on the financial strategy matrix model have a significant effect on shareholder value on a single year basis. It also did not provide answers clear enough to identify the strongest drivers of value that have a significant impact on an externally determined measure of value, like MVA, if the data is compared on a year-on-year basis. The only exceptions were IC_{beg} in the determination of MVA and a statistically very strong relationship between sales/IC_{beg} and MVA/IC_{beg}.

The analysis also showed that there is a very strong relationship between the median MVA and the median EVA of companies with positive spreads for the period from 1993 to 2002.

The next chapter discusses the final conclusions and recommendations.

CHAPTER 9

CONCLUSIONS AND RECOMMENDATIONS

9.1 INTRODUCTION

Today there is widespread agreement that maximizing shareholder wealth is the single, most important financial objective of a business enterprise. There are, however, widely divergent opinions as to how this value maximization can be accomplished most effectively. In order to manage the drivers of value, they need to be identified, measured, incentivised in terms of manager remuneration and, ultimately, optimised.

Over the last few years, there has been growing criticism of and dissatisfaction with the traditional accounting-based measures of performance. Statements that criticise earnings-based performance measures as having a conservative accounting bias, as well as having no influence on shareholder value, have been aired and reported. Groundbreaking work by Rappaport (1986), who focused on shareholder value and took into account the shortcomings of accounting measures, prepared the way for a value management approach.

The currently popular view is that the economic profit of a company, as expressed by its EVA, has the greatest influence on the external measure of performance, the MVA. Stewart (1991:153) and Stern (1993:36), working together in the firm Stern Stewart Consulting Company, are the main advocates of EVA and MVA and they have made a concerted effort to market these concepts worldwide.

This study has endeavoured to investigate the most recent research on EVA and MVA and to use companies listed on the JSE of South Africa to test the application of these concepts. A summary of the approach used to do this is given in the next section.

9.2 APPROACH FOLLOWED

Theoretical research focusing on the weaknesses of traditional accounting measures of performance and the superiority of EVA and MVA has laid the foundation for the empirical study done on the data of South African companies. A relative measure of internal performance, the spread (the EVA divided by the IC_{beg}), was used to rank local companies and to identify the best performers.

Then the financial strategy matrix model as defined by Hawawini and Viallet (1999:507) was used to place companies in a certain quadrant on the financial strategy matrix. It was indicated that the position of a specific company relative to the optimal quadrant would determine the financial strategies most appropriate for that company. This was followed by some statistical tests evaluating the strength of the financial strategy matrix model and some tests to identify the main drivers of EVA. The recommendations are based on the outcomes of the theoretical and empirical findings. The steps incorporated in the approach can be summarised as follows:

- theoretical research on accounting measures and EVA and MVA;
- empirical research on South African companies listed on the JSE;
- a ranking of companies in terms of spreads;
- the placement of companies on the financial strategy matrix;
- statistical tests to verify the strength of the financial strategy matrix model;
- statistical tests to identify the main drivers of EVA and to test the level of correlation between MVA and EVA, as well as MVA and the main drivers of EVA; and
- recommendations based on the outcomes of the steps above.

9.3 RESEARCH RESULTS

The research results are summarized in two categories, namely theoretical research and empirical research.

9.3.1 Theoretical research

The need to identify and measure the ability of a company to create shareholder value emerged clearly from this research. Furthermore, the widespread disillusionment with traditional accounting-based measures of performance with very little impact on market values is well documented. The alternatives to the accounting measures that have been suggested all account for the full cost of capital and are therefore all equivalent to economic profits. Of these, EVA is the best known.

Numerous authors including Stewart (1991:215) and Stern (1993:36) have provided evidence supporting EVA as having a stronger relationship with MVA than any of the other accounting measures tested. There has also been some criticism of EVA and authors such as Kramer and Pushner (1997:41) and Biddle *et al.* (1999:69) have provided evidence showing that EVA is not superior to some accounting-based measures. No doubt this debate regarding the purported superiority of EVA will continue for some time.

9.3.2 Empirical research

The calculation of spreads, which are relative measures of performance, allowed a comparison of the performance of companies of different sizes. The four companies that achieved the highest median spreads for the ten-year period from 1993 to 2002 were calculated to be MNet-Supersport, Pick'nPay, Oceana Fisheries and Shoprite. The four worst performers over the same period were Conafex, Highveld Steel, Rainbow Chickens and Spescom.

There was only one sub-sector that was represented by more than one company in the top ten rankings, namely the food and drug retailing sector. Another noteworthy feature that emerged from the results of the rankings is the fact that there was a distinct improvement in the median spreads achieved in the five-year period from 1998 to 2002 (4,6%), compared to the period from 1993 to 1997 (1,9%).

The results of the placement of individual companies and sub-sectors, as well as all companies for a given year, on the financial strategy matrix provided some valuable insights that can be used to improve the effectiveness of the model as a strategic tool. Three individual companies, namely Pick'nPay (representing "very good performance"), Ellerines (representing "average performance") and Conafex (representing "very poor performance"), were placed on the financial strategy matrix.

As far as performance in terms of spreads is concerned, the financial strategy matrix clearly indicated the consistent superior performance of Pick'nPay, the average performance of Ellerines and the weak performance of Conafex. However, for the sales growth minus the SGR percentage, the distinction between good and bad performance was not at all clear, because of the volatility and ambiguity of this measure. Even the results for Pick'nPay do not indicate that its sales growth rate was consistently kept below the SGR.

The placement of the median results of the sub-sectors showed that Sub-sector 21 (the food and drug retailing sector with only Pick'nPay and Shoprite) outperformed the other sub-sectors consistently and by a wide margin in terms of spreads over the ten-year period from 1993 to 2002. The placement of all 89 companies on the financial strategy matrix for each year from 1993 to 2002 showed a gradual improvement in spreads over time.

As far as the median sales growth minus the SGR percentage is concerned, the differential was negative for only three years and positive for seven years. This could be an indication that companies run the risk of accumulating cash shortages. However, as the SGR percentage is only reliable if some strict assumptions are met, one is inclined to conclude that this criterion does not contribute much valuable decision-making information on a single-year basis.

The statistical tests on the strength of the financial strategy matrix model were aimed at testing the impact of the two criteria, namely spreads and the sales growth minus the SGR percentage, relative to market value. Although some positive correlation was found between spreads and the indicators of market value, the results were not conclusive enough to prove that higher positive spreads have a greater impact on market value than lower positive spreads. Very little correlation was found between the sales growth minus the SGR percentage and market value, again underlining the need to change or replace this measure in order to improve the effectiveness of the model.

Another series of statistical tests tested the relationship between MVA and two other adjusted versions of MVA relative to EVA and the main drivers of EVA. As far as the relationship between MVA and EVA was concerned, the results showed weak correlations when the data of the dependent and independent variables were compared on a year-on-year basis. Perhaps this low correlation can be attributed to the great fluctuations in MVA caused by external factors from one year to the next. However, when the median MVA and median EVA were used for each company over the ten-year period from 1993 to 2002, there was excellent correlation, with an r^2 of 75%. This supports the contention that in the long run, EVA is the best internal driver of MVA.

The tests on the strength of the relationships between MVA (and the other two versions of MVA) relative to the main drivers of EVA revealed very low correlation coefficients in general on a year-on-year basis. The only significant correlations that were economically plausible (had the correct sign) were a strong relationship between MVA and IC_{beg} and between MVA/IC_{beg} and Sales/IC_{beg}. This leads to the conclusion that IC seems to be the one driver of EVA with the single greatest impact on market value.

9.4 RECOMMENDATIONS AND AREAS FOR FURTHER RESEARCH

It has become clear from this study that popular financial earnings-based measures of performance do not serve the purposes of shareholder value maximization. One of the main reasons for this is that they do not reflect the opportunity cost of own (equity) capital used in a business. EVA, which is similar to residual income or economic profits, is currently considered to be the best internal driver of value and the results of this study support that view.

However, in comparing the performance of a number of companies, a straightforward comparison of the absolute amounts of EVA would be unfair, because the IC employed to earn the EVA differs from company to company. The first recommendation of this study is that a relative adjusted version of EVA must be used when EVA performance is compared.

This relative measure of performance is the “performance spread”, or, in short, the “spread” of the company. Expressing the EVA for a given year as a percentage of the IC at the beginning of the year will yield the spread. It can also be determined by simply subtracting the WACC from the ROIC. If the internal value creation is the only evaluation criterion and a number of companies are involved, then ranking according to spreads will be appropriate.

The financial strategy matrix model by Hawawini and Viallet (1999:507) was used to place companies and sectors on a financial strategy matrix and to determine appropriate strategies based on positions on the graph. The model has great appeal because of its simplicity and the fact that it incorporates internal value creation and cash flow management. However, it is suggested that some changes are made to improve the model.

After placing some companies and sectors on the financial strategy matrix and some statistical testing, it was concluded that the spreads plotted on the y-axis must remain unchanged. The study has shown that the measure used to monitor cash management, namely sales growth minus the SGR percentage, yields widely fluctuating, unreliable results.

It is therefore recommended that this measure of cash management be replaced with a more reliable indicator of the company's ability to manage its cash flow, like the cash available from operating activities (CAOA) (Koen and Oberholster 2002:24). In order to transform this absolute value into a relative value, the CAOA can be divided by the IC_{beg}. The financial strategy matrix would then plot spreads on the y-axis and CAOA/IC_{beg} (as a percentage) on the x-axis.

Furthermore, it is recommended that evaluations of performance based on single-year plots on the financial strategy matrix be avoided because of the dangers of basing decisions on once-off results that do not reflect the trend or the norm. It is suggested that the data of a company or sector be plotted and analysed over a period of, say, five or ten years, so that the most recent performance can be weighed up against the trend.

It is also recommended that the performance of individual companies be compared to the results of the sector in which the company operates and perhaps also against the average or median results of all listed companies. This should provide a more comprehensive picture of the relative performance of a company and lay the foundation for balanced strategic decision-making.

Further areas of study could include investigating other appropriate measures of cash flow management (other than sales growth minus the SGR percentage and CAOA/IC_{beg} as recommended above). Further research could also endeavour to add more variables to the financial strategy matrix model so that the financial component of the "balanced scorecard" is a "balanced scorecard" in its own right. Having more than two variables would unfortunately preclude plotting the data on a two-dimensional graph.

Recent research by Copeland (2002:53) and Rappaport and Mauboussin (2001:69) use expectations theory to develop optimal financial strategies. It is suggested that further research could focus on the link between EVA, MVA and expectations theory in order to fine-tune and improve the current best-practices model even further.

9.5 CONCLUSION

The search for one financial performance measure that satisfies the requirements of theoretical soundness, economic reality, reliability and shareholder value maximization has continued for many years and still continues. Most of the popular financial accounting indicators have glaring weaknesses that render them inappropriate as reliable measures of performance. EVA overcomes most of these limitations and represents an internal measure of performance that takes into account the full cost of capital.

This study has analysed South African companies listed on the JSE and illustrated how a relative measure of internal performance, spreads, can be used to rank companies in terms of value creation. Furthermore, individual companies and sectors were placed on a financial strategy matrix, which evaluated companies according to spreads and cash flow management, indicated by the sales growth minus the SGR percentage. Positions on the financial strategy matrix determined the appropriate financial strategies available to companies in order to improve their value most effectively.

The study has tested the impact of the two variables evaluated by the model on shareholder value and has suggested some adjustments in order to improve the relevance and efficiency of the model. These suggestions were also aimed at expanding the single-year model to a periodic model that reflects changes over time and facilitates comparisons with sector averages and the average results of all companies. These adjustments will hopefully allow analysts to judge better not only the level, but also the consistency and sustainability of a company's performance.

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APPENDIX A

LIST OF COMPANIES IN FINAL DATABASE

ADCORP HOLDINGS
AECI
AFRICAN OXYGEN
AFROX HEALTHCARE
ALEX WHITE HOLDINGS
ALLIED ELECTRONICS CORPORATION
ALLIED TECHNOLOGIES
AMALGAMATED BEVERAGE INDUSTRIES
ANBEECO INVESTMENTS HOLDINGS
ANGLOVAAL INDUSTRIES
ASPEN PHARMACARE HOLDINGS
BARLOW WORLD
BASIL READ HOLDINGS
BEARING MAN
BIDVEST GROUP
BOWLER METCALF
BRANDCORP HOLDINGS
CARGO CARRIERS
CASHBUILD
CAXTON CTP PUBLISHERS & PRINTERS
CERAMIC INDUSTRIES
CHEMICAL SERVICES
COMBINED MOTOR HOLDINGS
CONAFEX HOLDINGS SOCIETE ANON
CONCOR
CONTROL INSTRUMENTS GROUP
CROOKES BROTHERS
CULLINAN HOLDINGS
DELTA ELECTRICAL INDUSTRIES
DIMENSION DATA HOLDINGS

DISTELL GROUP
EDGARS CONSOLIDATED STORES
ELB GROUP
ELECTRONIC MEDIA NETWORK
ELLERINE HOLDINGS
FORIM HOLDINGS
GLODINA HOLDINGS
GRINROD
GRINTEK
GROUP FIVE
HIGHVELD STEEL & VANADIUM CORPORATION
HUDACO INDUSTRIES
ILLOVO SUGAR
IMPERIAL HOLDINGS
INMINS
ISCOR
ITALTILE
JASCO ELECTRONICS HOLDINGS
JIGSAW HOLDINGS
JOHNNIC COMMUNICATIONS
KERSAF INVESTMENTS
LA GROUP
LABAT AFRICA
MEDI-CLINIC CORPORATION
METRO CASH & CARRY
MR PRICE GROUP
MURRAY & ROBERTS HOLDINGS
NAMIBIAN SEA PRODUCTS
NAMPAK
NEW CLICKS HOLDINGS
NU-WORLD HOLDINGS
OCEANA GROUP
PALS HOLDINGS
PEPKOR
PICK ‘N PAY STORES

PRETORIA PORTLAND CEMENT COMPANY
PUTCO
RAINBOW CHICKEN
RELYANT RETAIL
REUNERT
REX TRUEFORM CLOTHING COMPANY
RICHEMONT SECURITIES AG
SABMILLER PLC
SAPPI
SASOL
SEARDEL INVESTMENT CORPORATION
SHOPRITE HOLDINGS
SPESCOM
SUN INTERNATIONAL (SA)
TIGER BRANDS
TONGAAT-HULETT GROUP
TRANSPACO
TRENCOR
UNITRANS
VAALTRUCAR
W B HOLDINGS
WILSON BAYLEY HOLMES-OVCON
WINHOLD
WOOLTRU

APPENDIX B

LIST OF SUB-SECTORS

NAME OF SUB-SECTOR	SUB-SECTOR CODE	NO OF COMPANIES
OIL AND GAS	1	1
CHEMICALS	2	3
FORESTRY AND PAPER	3	1
STEEL & OTHER METALS	4	2
CONSTRUCTION & BUILDING MATERIALS	5	10
BEVERAGES	6	3
FOOD PRODUCERS & PROCESSORS	7	10
HEALTH	8	3
PHARMACEUTICALS & BIOTECHNOLOGY	9	1
HOUSEHOLD GOODS & TEXTILES	10	6
AUTOMOBILES & PARTS	11	2
GENERAL RETAILERS	12	14
SUPPORT SERVICES	13	6
LEISURE, ENTERTAINMENT & HOTELS	14	3
MEDIA & PHOTOGRAPHY	15	3
TRANSPORT	16	5
DIVERSIFIED INDUSTRIALS	17	2
ELECTRONIC & ELECTRICAL EQUIPMENT	18	7
ENGINEERING & MACHINERY	19	1
SOFTWARE & COMPUTER SERVICES	20	2
FOOD & DRUG RETAILERS	21	2
DEVELOPMENT CAPITAL	22	1
VENTURE CAPITAL	23	1

APPENDIX C

RANKING OF COMPANIES IN TERMS OF SPREADS – 2002

Rank	Company name	Sector	Spread %
1	WOOLTRU	12	206.9
2	JOHNCOM	15	160.5
3	SHOPRIT	21	38.7
4	PALS	10	37.7
5	MNET-SS	15	28.5
6	ALTECH	18	27.2
7	CASHBIL	5	25.2
8	PICKNPAY	21	24.8
9	ASPEN	9	23.2
10	BOWCALF	13	22.7
11	CULLINAN	14	22.3
12	CMH	11	21.9
13	DELTA	18	20.7
14	OCEANA	7	20.6
15	CERAMIC	5	20.5
16	ITLTILE	5	19.8
17	TIGBRANDS	7	16.6
18	BEARMAN	12	16.4
19	UNITRAN	16	15.1
20	CHEMSVE	2	14.4
21	BRANDCO	12	13.2
22	CONCOR	5	12.3
23	CONTROL	18	12.1
24	METCASH	12	11.4
25	WBHO	5	11.3
26	AHEALTH	8	11.3
27	BIDVEST	13	11.1
28	REUNERT	18	10.3
29	SASOL	1	10.0
30	LABAT	24	10.0
31	A-V-I	7	9.9
32	NUCLICKS	12	9.9
33	MEDCLIN	8	9.7
34	MRPRICE	12	8.8
35	BASREAD	5	8.6
36	INMINS	12	8.3
37	PPC	5	8.0
38	TRNPACO	13	8.0
39	HUDACO	19	8.0
40	ABI	6	7.7
41	JASCO	18	7.6
42	WBHOLD	7	7.0

43	AFROX	2	6.8
44	CARGO	16	6.8
45	RAINBOW	7	6.5
46	ADCORP	13	6.4
47	AECI	2	5.2
48	SEARDEL	10	5.2
49	ALEXWYT	13	4.9
50	M&R-HLD	5	4.2
51	WINHOLD	12	3.7
52	LA-GROUP	12	3.4
53	IMPERIAL	17	3.4
54	PUTCO	16	3.1
55	NAMPAK	13	2.5
56	ILLOVO	7	2.1
57	ALTRON	18	1.9
58	PEPKOR	12	1.7
59	EDCON	12	1.5
60	JIGSAW	23	1.5
61	BARWORLD	17	1.4
62	NUWORLD	10	1.1
63	CAXTON	15	1.1
64	GROUP-5	5	0.9
65	ELLERINE	12	0.5
66	SAB	6	0.0
67	DISTELL	6	-0.1
68	CROOKES	7	-0.4
69	GRINDROD	16	-0.4
70	SAPPI	3	-1.3
71	ELBGROUP	5	-1.3
72	VALCAR	11	-1.6
73	TONGAAT	7	-1.9
74	RELYANT	12	-2.4
75	GRINTEK	18	-2.6
76	HIVELD	4	-5.1
77	GLODINA	10	-5.4
78	REX-TRUE	12	-5.4
79	KERSAF	14	-5.4
80	SISA	14	-5.9
81	ISCOR	4	-7.1
82	FORIM	8	-7.4
83	RICHEMONT	10	-8.1
84	DIDATA	20	-10.9
85	TRENCOR	16	-11.0
86	CONAFEX	7	-15.2
87	NAMSEA	7	-16.4
88	SPESCOM	20	-35.2
89	ANBEECO	10	-380.4

APPENDIX D

RANKING OF COMPANIES IN TERMS OF MEDIAN SPREADS – 1993 TO 1997

Rank	Company name	Sector	Spread %
1	OCEANA	7	21.6
2	SHOPRIT	21	19.3
3	WBHO	5	17.1
4	PICKNPAY	21	16.5
5	CONCOR	5	13.3
6	JASCO	18	13.1
7	CMH	11	11.4
8	BOWCALF	13	10.5
9	DELTA	18	9.9
10	BRANDCO	12	9.8
11	EDCON	12	9.6
12	NAMSEA	7	9.5
13	BEARMAN	12	9.3
14	HUDACO	19	9.1
15	CERAMIC	5	8.0
16	NAMPAK	13	7.9
17	REUNERT	18	7.5
18	WOOLTRU	12	7.2
19	CAXTON	15	7.0
20	IMPERIAL	17	6.9
21	ABI	6	6.7
22	GRINTEK	18	6.5
23	PEPKOR	12	5.9
24	MNET-SS	15	5.7
25	CONTROL	18	5.5
26	SAB	6	5.4
27	UNITRAN	16	5.2
28	NUCLICKS	12	5.1
29	TIGBRANDS	7	4.9
30	CASHBIL	5	4.3
31	PALS	10	4.0
32	CHEMSVE	2	3.9
33	MRPRICE	12	3.6
34	AFROX	2	3.5
35	GROUP-5	5	3.5
36	CARGO	16	3.3
37	SEARDEL	10	3.2
38	SISA	14	3.2
39	ALTRON	18	2.8
40	DISTELL	6	2.8
41	ELLERINE	12	2.6

42	METCASH	12	2.2
43	MEDCLIN	8	2.0
44	AHEALTH	8	1.8
45	INMINS	12	1.8
46	ELBGROUP	5	1.5
47	WINHOLD	12	1.3
48	ALTECH	18	0.9
49	ASPEN	9	0.9
50	ANBEECO	10	0.7
51	GLODINA	10	0.6
52	TRNPACO	13	0.2
53	ITLTILE	5	-0.2
54	M&R-HLD	5	-0.2
55	A-V-I	7	-0.3
56	NUWORLD	10	-0.4
57	PPC	5	-0.5
58	RICHEMONT	10	-0.6
59	SASOL	1	-1.0
60	TRENCOR	16	-1.1
61	GRINDROD	16	-1.2
62	BARWORLD	17	-2.0
63	JOHNCOM	15	-2.0
64	VALCAR	11	-2.2
65	KERSAF	14	-2.3
66	AECI	2	-2.4
67	ADCORP	13	-2.5
68	PUTCO	16	-2.5
69	ALEXWYT	13	-2.6
70	RELYANT	12	-3.3
71	BIDVEST	13	-3.6
72	FORIM	8	-4.2
73	REX-TRUE	12	-4.2
74	DIDATA	20	-4.5
75	TONGAAT	7	-4.7
76	ILLOVO	7	-4.8
77	CROOKES	7	-5.0
78	WBHOLD	7	-5.4
79	JIGSAW	23	-5.9
80	BASREAD	5	-6.5
81	ISCOR	4	-7.1
82	SAPPI	3	-9.2
83	SPESCOM	20	-9.5
84	CONAFEX	7	-10.4
85	HIVELD	4	-10.7
86	LABAT	24	-11.6
87	RAINBOW	7	-15.2
88	CULLINAN	14	-15.6
89	LA-GROUP	12	-19.9

APPENDIX E

RANKING OF COMPANIES IN TERMS OF MEDIAN SPREADS – 1998 TO 2002

Rank	Company name	Sector	Spread %
1	MNET-SS	15	24.9
2	PICKNPAY	21	24.8
3	SHOPRIT	21	23.4
4	ASPEN	9	22.8
5	OCEANA	7	20.6
6	CERAMIC	5	20.5
7	BOWCALF	13	19.1
8	GRINTEK	18	16.8
9	CASHBIL	5	16.5
10	CMH	11	16.2
11	LA-GROUP	12	16.0
12	ALTECH	18	15.5
13	TIGBRANDS	7	15.2
14	WBHO	5	15.2
15	ADCORP	13	14.6
16	REUNERT	18	14.5
17	ITLTILE	5	14.3
18	DELTA	18	13.0
19	BIDVEST	13	11.1
20	CONCOR	5	10.8
21	METCASH	12	9.6
22	PEPKOR	12	8.9
23	MRPRICE	12	8.8
24	PALS	10	8.7
25	BASREAD	5	8.6
26	NUCLICKS	12	8.5
27	UNITRAN	16	8.5
28	NAMPAK	13	8.2
29	TRNPACO	13	8.0
30	ABI	6	7.7
31	JASCO	18	7.6
32	BEARMAN	12	7.2
33	INMINS	12	7.0
34	JIGSAW	23	6.9
35	BRANDCO	12	6.8
36	AFROX	2	6.7
37	A-V-I	7	6.6
38	HUDACO	19	6.3
39	SASOL	1	6.3
40	CHEMSVE	2	5.5
41	AHEALTH	8	5.1
42	ALTRON	18	4.9

43	CARGO	16	4.9
44	JOHNCOM	15	4.9
45	MEDCLIN	8	4.6
46	PUTCO	16	3.7
47	PPC	5	3.6
48	IMPERIAL	17	3.4
49	SAB	6	2.7
50	ALEXWYT	13	2.5
51	GROUP-5	5	2.5
52	ILLOVO	7	2.1
53	EDCON	12	2.0
54	M&R-HLD	5	1.8
55	CAXTON	15	1.7
56	BARWORLD	17	1.4
57	DISTELL	6	1.3
58	CULLINAN	14	1.2
59	ELLERINE	12	0.5
60	WINHOLD	12	0.5
61	LABAT	24	-0.4
62	ELBGROUP	5	-1.3
63	RICHEMONT	10	-1.3
64	SAPPI	3	-1.3
65	VALCAR	11	-1.4
66	SPESCOM	20	-1.5
67	GRINDROD	16	-1.6
68	AECI	2	-2.0
69	NUWORLD	10	-2.4
70	RELYANT	12	-2.4
71	SISA	14	-2.4
72	CROOKES	7	-2.6
73	SEARDEL	10	-2.6
74	CONTROL	18	-3.3
75	WOOLTRU	12	-3.4
76	TONGAAT	7	-4.0
77	REX-TRUE	12	-4.2
78	WBHOLD	7	-5.2
79	KERSAF	14	-5.4
80	HIVELD	4	-5.8
81	ISCOR	4	-5.9
82	TRENCOR	16	-7.0
83	FORIM	8	-7.4
84	RAINBOW	7	-8.5
85	NAMSEA	7	-9.1
86	GLODINA	10	-10.1
87	DIDATA	20	-10.9
88	CONAFEX	7	-14.9
89	ANBEECO	10	-37.7

APPENDIX F

RANKING OF COMPANIES IN TERMS OF MEDIAN SPREADS – 1993 TO 2002

Rank	Company name	Sector	Spread %
1	MNET-SS	15	24.6
2	PICKNPAY	21	21.9
3	OCEANA	7	21.1
4	SHOPRIT	21	19.7
5	CMH	11	15.8
6	WBHO	5	15.7
7	BOWCALF	13	12.8
8	CERAMIC	5	12.8
9	GRINTEK	18	12.3
10	CONCOR	5	11.6
11	REUNERT	18	11.2
12	DELTA	18	10.9
13	CASHBIL	5	9.6
14	BEARMAN	12	8.9
15	JASCO	18	8.8
16	HUDACO	19	8.3
17	NAMPAK	13	8.0
18	PEPKOR	12	7.8
19	BRANDCO	12	7.7
20	ITLTILE	5	7.6
21	ABI	6	7.1
22	UNITRAN	16	7.0
23	METCASH	12	7.0
24	NUCLICKS	12	6.8
25	TIGBRANDS	7	6.4
26	PALS	10	6.4
27	CAXTON	15	6.3
28	WOOLTRU	12	6.3
29	ALTECH	18	5.9
30	INMINS	12	5.3
31	CHEMSVE	2	5.2
32	LA-GROUP	12	5.2
33	SAB	6	4.6
34	MRPRICE	12	4.4
35	EDCON	12	4.4
36	AFROX	2	3.9
37	CONTROL	18	3.8
38	IMPERIAL	17	3.7
39	CARGO	16	3.6
40	ALTRON	18	3.4
41	AHEALTH	8	3.3

42	PUTCO	16	3.2
43	GROUP-5	5	3.0
44	MEDCLIN	8	2.6
45	BIDVEST	13	1.9
46	ELLERINE	12	1.9
47	PPC	5	1.9
48	DISTELL	6	1.7
49	ASPEN	9	1.6
50	RICHEMONT	10	1.3
51	BASREAD	5	1.1
52	SISA	14	1.0
53	WINHOLD	12	0.9
54	TRNPACO	13	0.8
55	ELBGROUP	5	0.7
56	M&R-HLD	5	0.6
57	A-V-I	7	0.5
58	ADCORP	13	0.3
59	SASOL	1	-0.4
60	NUWORLD	10	-0.4
61	SEARDEL	10	-0.4
62	BARWORLD	17	-1.2
63	GRINDROD	16	-1.3
64	JOHNCOM	15	-1.5
65	VALCAR	11	-1.7
66	ALEXWYT	13	-2.0
67	JIGSAW	23	-2.1
68	AECI	2	-2.2
69	ILLOVO	7	-2.3
70	RELYANT	12	-2.9
71	CROOKES	7	-3.2
72	CULLINAN	14	-4.2
73	REX-TRUE	12	-4.2
74	TONGAAT	7	-4.2
75	KERSAF	14	-4.4
76	TRENCOR	16	-4.5
77	DIDATA	20	-4.5
78	FORIM	8	-4.9
79	ANBEECO	10	-4.9
80	WBHOLD	7	-5.3
81	NAMSEA	7	-5.4
82	SAPPI	3	-5.5
83	GLODINA	10	-5.7
84	ISCOR	4	-6.6
85	LABAT	24	-8.3
86	SPESCOM	20	-8.4
87	RAINBOW	7	-9.9
88	HIVELD	4	-10.1
89	CONAFEX	7	-13.8