

CHAPTER 3

MEASURING SHAREHOLDER VALUE THE ECONOMIC WAY - SUNDRY APPROACHES

3.1 THE ACCOUNTING MODELS VERSUS THE ECONOMIC MODELS

The previous chapter concluded by shortly pointing out some shortcomings of the accounting-based methods. Before starting the discussion on the economic-based models, a more in-depth discussion on the shortcomings of the accounting-based methods is not only appropriate, but sets the scene for the next two chapters.

3.1.1 Introduction

In answer to the question of what drives, determines or sets share prices, there are two competing answers.

The traditional accounting model of valuation contends that share prices are set when the stock exchange capitalizes a company's earnings per share (EPS) at an appropriate price/earnings ratio (P/E ratio). The appeal of this accounting model is its simplicity and apparent precision. The problem, however, is that the P/E ratio of a company changes all the time, due to possible acquisitions, changes in accounting policies or as investment opportunities arise (and/or disappear). This makes EPS a very unreliable measure of value (Stewart 1990:22).

The economic model of valuation holds that share prices are determined in essence by just two things: the cash to be generated over the life of a business and the risk associated with the cash receipts.

The accounting model relies on two distinct financial statements (the income statement and the balance sheet), whereas the economic model uses only sources and uses of cash. Whether a cash outlay is included in the income statement or

capitalized in the balance sheet makes a big difference to the earnings amount reported. In the economic model, **where** cash flows are recorded makes no difference, unless that affects taxes.

This conflict is further highlighted if a company is permitted to choose between alternative accounting methods. In other words, there are a number of factors where different accounting bases are recognised and which can have a substantial influence on the financial results in the financial statements. The following are examples:

- a) the depreciation of fixed assets;
- b) the amortization of intangible assets like research and development, goodwill and patents;
- c) inventory;
- d) long-term contracts;
- e) deferred tax;
- f) instalment transactions;
- g) the conversion of foreign exchange;
- h) consolidation policies;
- i) property development transactions; and
- j) product- and service guarantees.

These are not the only factors that can give rise to a different treatment of financial (accounting) data by accountants, as the list can be extended depending on the specific operations of a company (Vorster, Joubert & Koen 1996:5-24). A number of these factors are discussed below.

3.1.2 Inventory valuation – LIFO versus FIFO

In South Africa, a company is permitted to use either the LIFO (last in, first out) or FIFO (first in, first out) method of valuating inventory for accounting purposes. The company is, however, compelled to disclose the valuation on the **FIFO** basis. If a company, in a period of rising prices, switches from FIFO to LIFO, the switch will cause reported earnings to decrease, but the savings in taxes will cause an increase in cash. Stewart (1990:24) quotes research that shows that the market focuses on the increase in cash and not on the decline in book earnings.

An appraiser using accounting-based methods can be faced with earnings per share (EPS) on the "FIFO" or the "LIFO" method.

3.1.3 The amortization of goodwill

Goodwill can arise when one company acquires another company for a value or premium over the estimated book value of the seller's assets.

The amortization of goodwill in the accounting framework reduces reported earnings. However, because this is a non-cash, non-tax-deductible expense, the amortization of goodwill *per se* does not have an influence on the economic model of valuation.

Evidence shows that share prices are determined by the cash that is expected to be generated and not by reported earnings. A company's earnings explain its share price only to the extent that earnings reflect the cash embodied in the share price (Stewart 1990:28).

3.1.4 Research and development

Research and development (R & D) is another factor which reveals that earnings are an inappropriate measure of value.

Accountants can expense R & D outlays as if the potential R & D contribution to value is applicable only in the accounting period where the expense is incurred. One of the best examples of how the "misuse" of R & D causes a large discrepancy between the earnings and book value of a company and its economic value, is found among companies in the pharmaceutical industry. These companies spend vast amounts of money on R & D in order to obtain a substantial return over the long term for their investors. Expensing R & D over a shorter period than the period over which the expected (cash) benefits will arise is one of the reasons why these companies' earnings and book values can apparently understate the companies' value by a large margin. R & D should be capitalized onto the balance sheet and then amortized against earnings over the period of projected payoff from the successful R & D efforts.

One of the reasons why companies that invest heavily in R & D often enjoy sky-high share price multiples is the fact that their share prices capitalize an expected future payoff from their R & D, whereas their earnings are charged with an immediate expense (Stewart 1990:29).

3.1.5 Deferred tax

The aspects discussed above dealt with distortions that can affect **earnings**, therefore the income statement. However, balance sheet items are also subject to the accountants' mercy.

One of the items worth mentioning at this point is that of deferred tax. The question can be asked: is the deferred tax reserve which appears on the company's balance sheet debt or equity? It normally appears to be in a no-man's-

land between debt and equity on the balance sheet. Deferred tax is quite rightly considered by creditors to be a quasi-liability that uses up a company's capacity to borrow (Stewart 1990:33).

The entire character of the deferred tax reserve changes if one looks at it from the viewpoint of the shareholders. As long as the company remains a viable going concern the company's deferred tax reserve can properly be considered to be the equivalent of common equity and therefore does not have to be separated from net worth.

Furthermore, the year-to-year change in the reserve ought to be added to retained profits if the reserve is considered part of shareholders' equity. In this way, taxes are regarded as an expense only when they are paid (at which time they represent a cash flow), not when provided for by the accountants.

3.1.6 Earnings per share and return on net assets (RONA)

Some shortcomings and problems associated with earnings per share (EPS) were discussed in an example in Section 2.6. It is, however, such an important concept that it warrants further attention.

Consider an acquisition in which a company selling for a high price earnings (P/E) ratio buys a firm selling for a low P/E ratio by exchanging shares. Fewer of the high P/E shares are needed to retire all the issued low P/E ratio shares. Because fewer of the high P/E shares (from the buyer) are needed to retire all the issued low P/E shares, the buyer's EPS will always increase (Stewart 1990:35).

This transaction can also be conducted the other way round, i.e. the low P/E firm can buy the high-multiple company through a share exchange, in which case the buyer's EPS will always decrease.

Regardless of which company buys and which sells, the "merged company" will be the same ($H_i + L_o = L_o + H_i$) with the same assets, prospects, risks, earnings and value. Accounting earnings, however, suggests that the transaction is desirable only if it is consummated in one direction, $H_i + L_o$. In the economic model, what matters is the exchange of **value**, and not the exchange of earnings so popular with accounting enthusiasts.

As mentioned in the previous chapter, **earnings growth** is also a misleading indicator of performance. Consider two companies, X and Y, which have the same earnings and the same expected growth rate. The "sameness" would also probably result in identical share prices and P/E ratios. Suppose that X must invest more capital than Y to sustain its growth. Y will command a higher share price and P/E ratio because it earns a higher rate of return on the capital it invests (or, both companies earn the same, but Y does so on a smaller capital base). X invests to achieve the growth that Y achieves through a more efficient use of capital.

Rapid growth can be a misleading indicator of added value because it can be achieved (or "bought") by simply pouring more capital into a business. Earning an acceptable rate of return on capital invested is essential in the value creation process. Growth adds to value only when it is accompanied by an adequate rate of return (Stewart 1990:40).

One of the "fathers" of the economic models of calculating shareholder value, Joel Stern, wrote as early as 1974 about the dangers of using EPS in an evaluation of corporate policies.

Apart from his acquisition analysis example set out on the previous page (where he said that the problem lies in the fact that the *pro forma* EPS does not determine the *pro forma* share price) as discussed above, Stern (1974:39) also identified two other interesting corporate factors where EPS can distort the decision-making process to the detriment of the shareholders.

Firstly, investment should not be confused with financing. There are many ways in which financing decisions can affect EPS, but investment decisions must be made independently of financing decisions. Since EPS is calculated by dividing the net profit attributable to ordinary shareholders by the number of issued shares, basing investment decisions upon its effect on EPS implies that a specific source of funds finances a specific use of funds, which is, of course, conceptually incorrect. EPS can lead the decision-maker to believe that bad investments are good investments: if he levers (finance) the firm sufficiently at the time the investment is undertaken, EPS can be manipulated (enhanced) to any level he desires (Stern 1974:40).

Secondly, an emphasis on EPS can lead to wrong conclusions or decisions about the proportions of debt and equity in a company's financial structure. Even though, in most cases, an increase in the amount of debt in relation to equity enhances EPS, the benefits to a company's share price derived from its financing policies has nothing to do with EPS. The real benefit of debt financing to ordinary shareholders is not the added EPS, it is the "government-tax-saving" (own inverted commas) (Stern 1974:42).

It should be clear at this stage that valuations based on a company's earnings have many pitfalls and disadvantages. Moreover, to judge by market behaviour, EPS is not the criterion that impresses the sophisticated investors that really determine share prices. These investors do not simply discount expected earnings. They rather discount anticipated cash flows net of the anticipated capital requirements of the business, the so-called "Free Cash Flow".

The disadvantages of return on equity (ROE) as a method had been discussed in Chapter 2. One can, however, highlight some other dangers of using this measure of corporate performance by illustrating what could happen if return on net assets (RONA) is used as a basis for evaluating and rewarding the managers of the business.

Firstly, if a company or division is currently earning sub-standard returns, managers can increase RONA by accepting projects with a rate of return higher than RONA, but is, at the same time, employing a rate which could still be inadequate in the sense that it could be lower than the cost of capital. These investments, as will be demonstrated in Chapter 4, reduce shareholder value.

At the other extreme, consider a company that currently earns 25% RONA and has a cost of capital of 15%. In such a case, a manager could be discouraged from accepting projects with a rate of return of less than 25% because that would lower the **average** RONA. The firm could thus be passing up value-adding investments (Stern 1994:49).

3.1.7 Dividends

3.1.7.1 *The theory on dividends*

Stewart (1990:43) claims that not only do earnings not matter; dividends do not matter either.

In the economic model of valuation, payment of dividends can be viewed as a sign that management is unable to find enough attractive investment opportunities to use all available cash. Once they have distributed attributable earnings in the form of dividends (instead of re-investing them), management have less capital to fund future growth opportunities. However, if investment opportunities have been exhausted, it would be better to pay dividends rather than to make unrewarding investments.

But what about the shareholders? Do they want dividends? Three theories of investor preference for dividends can be presented:

- a) Miller and Modigliani in Brigham & Gapenski (1993:481) argue that dividend policy is irrelevant; that is, dividend policy does not affect a firm's cost of

capital or value. A firm's value is determined by its asset investment policy and its risk class rather than by how earnings are split between dividends and retained earnings. These author's propositions were made with a number of assumptions or conditions, the discussion of which falls beyond the scope of this study. What is important however is the fact that Miller and Modigliani argue that a **clientele effect** exists: a firm will attract shareholders whose preferences in respect of the payment (quantity or amount) and stability of dividends correspond to the payment pattern and stability of the firm itself (Gitman 1994:539). In other words, investors who seek a certain cash income from their portfolio tend to hold shares which provide them with that income (a certain dividend amount), or they must invest in financial instruments which provide them with that desired income. Investors who need cash do not need to get it from every component of their portfolio. Investors who prefer capital gains instead, are attracted to growing firms which entertain a relatively large reinvestment rate. Since shareholders get what they expect, Miller and Modigliani argue that the value of a firm's stock is unaffected by its dividend policy. As long as there are a sufficient number of investors with sufficient income who are seeking capital gains instead, firms with a relatively low dividend payout ratio need not worry: their firm's shares will sell for their fair value, unaffected by the dividend thereon (Stewart 1990:54).

- b) Gordon and Lintner in Brigham & Gapenski (1993:482) disagree with Miller and Modigliani and argue that dividends are less risky than capital gains. Therefore firms should set high dividend payout ratios in order to maximize their value. Miller and Modigliani disagree, and claim that a bird in the hand (a dividend) is worth two in the bush (capital gains). Stewart (1990:53) argues that dividends paid mean certain capital gains lost. Dividends are in effect "subtracted" from the share price, never to be recouped. The dividends that are paid out can only make the residual capital gain more risky.

- c) Litzenberger and Ramaswamy in Brigham & Gapenski (1993:483) bring the tax effect into the debate. They argue that since dividends attract a higher tax rate than capital gains (which was the position in South Africa a number of years ago, but could change in the (near?) future), a firm should pay a low (or zero) dividend in order to maximize its value. This argument contrasts, of course, with Gordon and Lintner's theory, but complement the general viewpoint that dividends do not matter.

One can conclude by stating that it appears that there is just a correlation between dividend announcements and share price, but **not** a true causal relationship. It is helpful to turn to empirical evidence and research in order to see whether these support the arguments in favour of the economic models.

3.1.7.2 The evidence on dividends

One of the most decisive empirical studies conducted on the effects of dividend yield and dividend policy on share prices, was done in 1974 by Black and Scholes (Brigham & Gapenski 1993:483). Their analysis revealed that return to investors was explained by the level of risk of the firm and not by the dividend payout ratio. The shares in their sample were classified in different risk classes, and within these risk classes some shares paid low, some paid modest and some paid high dividends. All the shares, however, experienced the same rate of return over a period of time.

The following two important conclusions can be drawn from this study (Stewart 1990:55):

- a) investors should ignore dividends when they are choosing shares. Instead, they should consider factors like risk, tax and value; and
- b) corporate managers should not attempt to influence share prices, investors' wealth or returns by their dividend policy. They should set a dividend policy

within the context of the company's investment programme and financing policy; that is, a "residual dividend policy", where the first priority is to take care of all the acceptable investment opportunities, after which the residual (if any) of the attributable earnings can be distributed as dividends.

3.1.8 Concluding remarks

Earnings, earnings per share and earnings growth are misleading measures of corporate performance or shareholder wealth. The problem arises from the fact that earnings can (and must) be altered by means of book entries that have nothing to do with cash flow.

Value-building investments such as R & D are charged against earnings instead of taking the real earning power of the expected life span into consideration.

Paying out dividends may deprive worthwhile capital projects of capital or may force the company and its investors to incur unnecessary transaction costs.

Despite the impressive empirical evidence assembled in the academic community in favour of the economic model of value, many corporate managers, valuers and even investors still prefer accounting-based methods (often with earnings as the basis) in order to determine wealth created for the shareholders of a company.

3.2 INTRODUCTION TO THE ECONOMIC MODELS

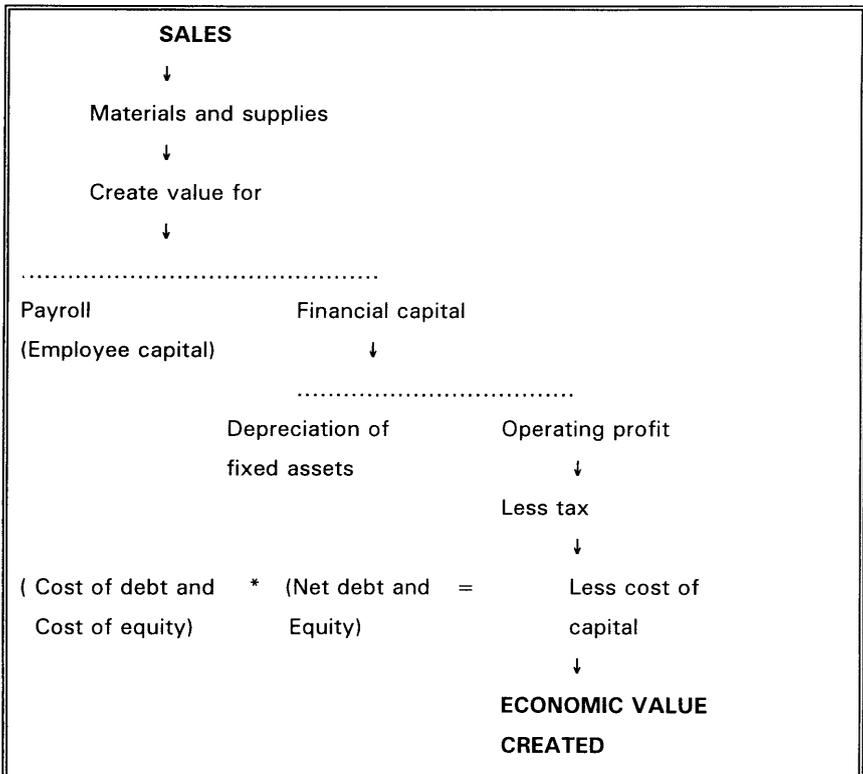
During the past three decades there has been a school of writers that have steadily began to realize the shortcomings of measures such as earnings per share, return on assets and return on investment.

These traditional measures of company performance are inadequate for the job in the sense that none of them isolate the most important concern of shareholders: Is management adding or subtracting value from capital? There has to be a better

way.

The **economic methods** acknowledge that whilst it is crucial to generate and then measure a profit or return from a firm's operations, it is of equal importance to express that profit in relation to the **amount of capital** used to generate that profit. These methods then do have special ways (and definitions) to calculate a firm's **economic profit** and **economic capital**.

Economic value can also be presented schematically in the following way (Kay 1994:35):



This chapter contains a discussion of a number of sundry economic-based methods to determine shareholder value.

The build-up to the ultimate model begins with a discussion of the work of Fruhan (1979). A number of economic valuation-based principles were introduced by him. The main criticism of his work was that he used only return on **equity**, and not the return on total economic capital.

Another author that proposed an economic-based method was Rappaport (1981, 1986). His articles during the early 1980's were followed by his book towards the end of that decade.

By now, this new way of calculating shareholder value was well established and Copeland, Koller and Murrin (1990) called their method "the economic profit model".

3.3 USING ECONOMIC VALUE TO MEASURE SHAREHOLDER WEALTH - EARLIER MODELS

3.3.1 Introduction

One of the first writers to recognize that the pure accounting-based methods of determining shareholder value were not adequate, was Fruhan.

His book, *Financial Strategy. Studies in the creation, transfer, and destruction of shareholder value*, in 1979 was among the first to set out a number of principles regarding the economic method of calculating shareholder wealth.

Fruhan (1979:7) stated that managers create economic value for their firm's shareholders when they undertake investments that produce returns that exceed the cost of capital. Fruhan (1979: 11) identified three factors which determine the economic value of a firm's equity:

- a) the size of the percentage point spread projected to be earned on the common equity over the cost of the firm's common equity;
- b) the amount of future investment opportunities which will generate these excess returns (this is equal to the net profit attributable to ordinary shareholders); and
- c) the number of years for which these returns can be earned before returns will be driven down to the cost of equity.

This economic value can be expressed in relation to the book value of a firm in a **ratio** by means of the following formula:

$$\frac{\text{Economic value}}{\text{Book value}} = \left(\frac{1 + (ROE)(RET)}{1 + K_e} \right)^n + \frac{ROE(1-RET)}{K_e - (ROE)(RET)} \left[1 - \left(\frac{1 + (ROE)(RET)}{1 + K_e} \right)^n \right]$$

where

- ROE = the anticipated rate of return on equity;
- K_e = cost of equity;
- RET = the retention rate, the percentage of income attributable to ordinary shareholders that is re-invested by the company; and
- n = the projected number of years for which extraordinary returns on equity are expected to be earned.

Firms that are able to earn rates of return on equity that consistently exceed their equity capital costs, have most of the following important characteristics:

- a) barriers of entry that are high in a competitive industry (These barriers of entry can be due to **unique products** and protected from competition by patents, trade marks or persuasive advertising. **Scale economics** in the production and marketing of products is a further barrier to entry that allows

a firm a competitive advantage. **High capital requirements** by certain industries or firms can also keep competitors at bay);

- b) focused product lines and a high market share; and
- c) an ability to generate redundant cash, i.e. all cash and marketable securities less borrowed money.

3.3.2 Method of calculating shareholder value

Fruhan (1979:102) demonstrates how to calculate the value created for a company's shareholders. As only the principles and basic calculation methods are discussed here, readers who are interested in the detail are referred to Fruhan's work.

Consider the following hypothetical example. A company's return on equity (after adjustment for the replacement cost of inventory and fixed assets, and for the capitalization and amortization of research and development expenditure - a topic discussed in greater detail later in this chapter) amounts to 18,9%. The real cost of equity capital amounts to 11,0%, which means that the firm achieved a **real** return on equity that was 7,9 percentage points in excess of the firm's **real** cost of equity capital.

Fruhan then proceeds to show how the elimination of the firm's redundant capital **increases** the spread between the real rate of return and the real cost of equity capital. This data is then used in conjunction with the formula in Section 3.2.1 in order to calculate the economic-value/book-value ratios (Fruhan 1979:104). The value for the firm's shareholders can be estimated by subtracting the adjusted book value of the firm's equity from its market value.

3.3.3 Evaluation

Fruhan did pioneering work in recognizing that there must be as wide as possible a **spread** between the return that a firm generates on the invested capital and the cost of that capital. However, he still uses return on **equity** in his explanations and calculations. This is done for both the "return" and the "cost" aspects. It is demonstrated in the next few sections of this chapter that it is return on **invested capital** and the **weighted average cost of capital** that matters.

The primary objective of Fruhan's work was to demonstrate that thinking about methods to enhance shareholder value can produce significant benefits for shareholders. Nevertheless, no checklist designed to ensure enhanced performance for every firm emerged from his work. None was promised. The work posed a challenge to managers to consider carefully how they might conduct a systematic review of value enhancement opportunities.

Management should take into consideration the following factors when thinking about value enhancement:

- a) ability to command premium product prices - in order to increase profit;
- b) achievement of a lower than average cost structure - in order to increase profit;
- c) the ability to obtain debt and equity at lower than normal cost - in order to reduce the financing cost;
- d) the design of a capital structure that is more efficient than those of competitors - in order to reduce financing cost and to optimise the amount of equity; and
- e) the avoidance of actions which may result in value destruction.

3.4 SHAREHOLDER VALUE CREATION

3.4.1 Introduction

Another writer who recognised the shortcomings or limitations of the accounting-based methods was Rappaport (1981:140).

His "shareholder value approach" estimates the economic value of an investment by discounting the forecast cash flows by the cost of capital. He then goes on to calculate the present value of a business by discounting the anticipated after-tax operating cash flow by the weighted average cost of capital.

The next section demonstrates how he incorporates his so-called "value drivers" (sales growth rate, operating profit margin, income tax rate, capital investment and a time span) into his shareholder value calculations. The net result of these calculations is an absolute Rand value which indicates the present value increase in shareholder value.

3.4.2 The shareholder value approach to a business

As mentioned in Section 3.3.1, any investment's value can be determined by discounting the anticipated cash flows by the cost of capital.

While many companies use this discounted cash flow (DCF) analysis at **project** level, they fail to take the broader picture, that of the entire business (unit), into consideration. One can thus find a situation where capital projects regularly exceed the minimum acceptable rate of return, while the **business unit** itself creates little or no value for the shareholders (Rappaport 1981:141).

In order to extend the DCF approach to the entire business unit, the following sequential steps must be followed:

- a) calculate the **minimum pretax operating return** on incremental sales which is needed to create value for the business unit (or the entire company);
- b) compare the minimum acceptable rates of return on incremental sales with the rates realised historically **and** the rates predicted for the future;
- c) calculate the contribution to shareholder value of various alternative strategies; and
- d) evaluate the corporate objectives regarding anticipated growth on sales, capital investments, target capital structure and dividend policy in order to determine the best value-contributing strategy.

The fourth step above is the subject of both Chapter 5 and the Conclusion to this study. An example in Section 3.4.3 below illustrates how the first three steps are calculated.

3.4.3 Calculation of shareholder value created

3.4.3.1 Basic principles and models

The total economic value of a business is the sum of the values of its debt and equity.

$$\text{Corporate value} = \text{Debt} + \text{Shareholder value}$$

The present value of the equity claims or shareholder value is then the value of the company less the market value of currently outstanding debt. The value of the equity of a firm that expects **no further real growth in sales** and expects that annual increases in costs will be offset against increases in sales prices, can be expressed by the following formula:

$$E_t = \frac{P(1 - T)S}{k} - D_t + M$$

where

- E_t = the value of the equity at time t ;
 p = earnings before interest and taxes (EBIT) **divided** by sales (in order to arrive at the **operating profit margin**, see Step a) above);
 T = the income tax rate;
 S = sales;
 k = the weighted average cost of capital;
 D_t = the market value of debt outstanding at time t ; and
 M = marketable securities, which are not incorporated in the operating cash flows.

The above basic model needs not be illustrated by means of a numeric example. Instead, one can move on to a more realistic case where :

- a) provision is made for an **increase** in sales; and
- b) the **change** in shareholder value, that is value **created**, is measured.

The change in shareholder value (E) for a given level of sales increase(S) can be calculated by the following formula :

$$\Delta E_t = \frac{P_t(1 - T) \Delta S_t}{k} - \frac{(f_t + w_t) \Delta S_t}{(1 + k)}$$

where

- P_t = EBIT/ sales, the incremental operating margin on incremental sales;
- f = capital investment minus depreciation per rand of sales increase; and
- w = cash required for net working capital per rand of sales increase.

The change in equity or shareholder value is the difference between the after-tax operating perpetuity and the required investment outlay for fixed and working capital. Since all cash flows are assumed to occur at the end of the period, the outlays for working capital and fixed assets are discounted by $(1 + k)$ to obtain the present value (Rappaport 1981:149).

3.4.3.2 The threshold margin

One of the basic principles on which the economic methods of valuation are based is that of the spread between the cost of and return on capital invested.

Rappaport (1986:69) calls his explanation of this concept, the "threshold margin".

The threshold margin represents the minimum operating profit margin that a business must maintain in order to maintain shareholder value. It represents that operating profit margin at which the business earns exactly its minimum acceptable rate of return, its cost of capital.

The threshold margin can be expressed in two ways:

- a) the margin required on total sales, the threshold margin; or
- b) the margin required on incremental sales, the **incremental** threshold margin.

The incremental threshold margin can be derived from the formula which expresses the change in shareholder value above, in Section 3.4.3.1. This formula can also

be expressed in words as follows:

Change in shareholder value	=	(Present value of incremental cash flow before new investment)	-	(Present value of investment in fixed and working capital)
	=	(Incr sales) * (Operating profit margin on incremental sales)		* (1-T)
		Cost of capital		
	-	(Incr sales) * (Incremental fixed plus working capital rate)		
		(1 + Cost of capital)		

While the first term represents the present value of the firm's inflows (assumed to occur from period 1 to perpetuity), the second term represents the present value of the investment (outflows) necessary to generate these inflows (Rappaport 1986:72).

There is neither an increase nor a decrease in shareholder value for a specified sales increase if the value of the inflows is identical to the value of the outflows:

$$\frac{P_t (1 - T)}{k} = \frac{(f_t + w_t)}{(1 + k)}$$

The incremental threshold margin is the operating profit margin on incremental sales that equates the present value of the cash inflows to the present value of the outflows. This margin represents the break-even operating return on sales or the minimum pretax operating return on incremental sales (p_{\min}) needed to create value for shareholders and is derived as follows (Rappaport 1981:149) :

$$p_{\min} = \frac{(f + w) k}{(1 - T) (1 + k)}$$

An important fact that emerges from this equation is that when a business is operating at the threshold margin, sales growth does **not** create shareholder value.

Shareholder value creation is determined by the product of three factors :

- a) sales growth;
- b) an incremental threshold spread, that is, profit margin on incremental sales less the minimum pretax operating return on the incremental sales needed to create value for shareholders; and
- c) the time span of a positive threshold spread (Rappaport 1986:74).

In other words, it is the after-tax capitalized value of the difference between the minimum acceptable operating return on incremental sales. The change in shareholder value for time t is then given by the following equation :

$$\Delta E_t = \frac{(P_t - P_{t \min}) (1 - T_t) \Delta S_t}{k(1 + k)^{t-1}}$$

3.4.3.3 Calculation example

To illustrate the above principles and formulas as developed by Rappaport, consider the following hypothetical case:

- a) A business forecast the following sales amounts for the next 4 years:

	19x0	19x1	19x2	19x3	19x4
Rm	100	115	125	145	160

- b) Pretax operating margins on incremental sales amount to 14% for the first

2 years after which they will increase to 15%.

- c) Working capital per Rand of sales = 20%.
- d) Capital investment per Rand of sales = 30%.
- e) Weighted average cost of capital = 12%.
- f) Tax rate = 35%.

Answer

In the first place, the minimum return on incremental sales (P_{\min}) must be calculated, as this input is necessary for the calculation which determines the increase in shareholder value.

$$\begin{aligned}
 P_{\min} &= \frac{(f + w)k}{(1 - T)(1 + k)} \\
 &= \frac{(0.3 + 0.2) * 0.12}{0.65 * 1.12} \\
 &= 8.24\%
 \end{aligned}$$

The present value of increase in shareholder value in **19x1** is the following:

$$\begin{aligned}
 \Delta E_t &= \frac{(P_t - P_{t \min})(1 - T_t) \Delta S_t}{k(1 + k)^{t-1}} \\
 &= \frac{(0.14 - 0.0824) * (1 - 0.35) * 15}{0.12 * (1.12)^0}
 \end{aligned}$$

= R4,68m

Using the same formula, but applying the relevant inputs as they occur in each year (**pretax operating margin** as well as **sales change**), the present value of increase in shareholder value is calculated as follows:

19x1	R4,68m
19x2	R2,79m
19x3	R5,84m
19x4	<u>R3,91m</u>
TOTAL	R17,22m

To summarise: Over a four year future period, total sales of R545m (with incremental sales of R60m) will result in a present value increase in shareholder value of R17,22m, taking into consideration the other variables (minimum operating margin, fixed and working capital levels, the cost of capital and the tax rate) as specified.

3.4.4 Concluding remarks

Because this study concentrates on another method of calculating shareholder value, only a simplified example of the model of Rappaport has been demonstrated. Interested readers are referred to the work by Rappaport, *Creating shareholder value* as indicated above.

This method of calculating the present value of shareholder wealth increase, as proposed by Rappaport, is actually aimed at a future **forecast** period, which does have definite advantages if a new investment strategy and its effects are to be

evaluated by management.

However, this method can also be used to calculate the increase in shareholder wealth in the current year or any other year in the past. All that is needed, of course, are the relevant inputs in the formulas, which can be obtained from the (adapted) financial statements.

One of the advantages of this method is its clear indication and identification of the inputs (value drivers) in the formula in order to determine shareholder wealth (a topic that is discussed in Chapter 5 of this study).

Although certain variables in the formulas in the example above were kept constant during the four year period, they can, of course, be varied in order to represent a more realistic scenario.

The model is easy to use, as well as easy to understand. It is compared and contrasted with other models at the end of this chapter.

3.5 THE ECONOMIC PROFIT MODEL

3.5.1 Introduction

Copeland, Koller and Murrin (1990:75) also recognise that there are fundamental problems with the use of accounting-based methods in determining the value of a company.

They propose a discounted cash flow (DCF) model which calculates the value of a company by factoring the capital investment and the other cash flows required to generate the earnings. This approach is based on the principle that an investment adds value if it generates a return that is higher than returns earned on investments of similar risk. For a given level of earnings, a company that earns more on its investments than its competitors can, needs to invest less capital in the

business and will generate higher cash flows and higher value.

Valuing a business by determining the present value of its expected cash flows, leaves unanswered a number of practical questions such as how to determine the cash flow, investment, or discount rate.

Although these concepts are used in the examples below illustrating these approaches, a detailed discussion is left for the latter part of this chapter, where variables that are used as inputs in the models as mentioned, are used in other models as well.

In this section, firstly certain valuation principles are examined, after which the Economic Profit Model proposed by Copeland, Koller and Murrin (1990:149) is illustrated.

3.5.2 Economic valuation principles

The value of a business can be seen as the discounted value of the expected future free cash flow. Free cash flow is equal to the after tax operating earnings of the company, plus non-cash charges (for example, the "cost" of depreciation), less investments in fixed and working capital (Copeland, Koller & Murrin 1990:139). Free cash flow **excludes** any financing-related cash flows such as interest or dividend payments. These free cash flows are then discounted with the firm's weighted average cost of capital (WACC) in order to arrive at a present value for the **forecasted** period.

However, an additional issue in valuing a business is its infinite life. The value of the business can be divided over two time periods, namely the value **during** the forecast period and the value **after** the forecasted period.

The value **after** the forecast period is called the **continuing** value. There are various

methods of calculating the continuing value. One approach is to calculate it as a perpetuity by means of the following formula:

$$\text{Continuing value} = \frac{\text{Net operating profit less adjusted taxes}}{\text{Weighted average cost of capital}}$$

The value of a company's **debt** is deducted from the value of operations as calculated above. The value of the debt equals the present value of the cash flow to the debt holders, discounted at a rate that reflects the riskiness of that flow (Copeland, Koller & Murrin 1990:141). Future borrowing can be ignored, as one can assume that the inflows from these debts will be equal to the outflows (repayments).

The above valuation of a company can be illustrated by means of the following hypothetical example overleaf:

YEAR	FREE CASH FLOW Rm	DISCOUNT FACTOR @ 15%	PRESENT VALUE OF FCF Rm
19x1	250	0.8696	217
19x2	285	0.7561	215
19x3	315	0.6575	207
19x4	310	0.5781	179
19x5	325	0.4972	162
CONTINUING VALUE	6,300	0.4972	<u>3,132</u>
Value of operations			4,112
Add: value of non-operating investments			<u>0,270</u>
Total entity value			4,482
Less: Value of debt			<u>(0,750)</u>
Equity value			<u>3,732</u>

The equity value calculated above can now also be divided by the number of ordinary shares issued in order to arrive at a value per share.

Once the above calculation had been done, there are still a number of unanswered questions or issues that have to be addressed; for example, how does this valuation compare with the company's value history or with the value of other companies? Moreover, how can the economics of the business be expressed in a way that helps the managers to understand what factors could increase or decrease the value of the business?

The issue of variables determining shareholder value will be addressed in Chapter 5 of this study. However, it has been established that since value is based on discounted free cash flow, the underlying value drivers of the business must also

be the drivers of free cash flow (Copeland, Koller & Murrin 1990:141). The two key drivers of free cash flow and ultimately value are, firstly, the **rate** at which a company can increase its revenues, profits, and capital base, and, secondly, the **return** on invested capital. A company that earns higher profits on every Rand invested than its competitors is worth more than a company that does not have such a high return. The same applies for a company that grows faster than another and both earn the same return on invested capital.

It can thus be seen that it is not only the **absolute** amount of the profit that matters, but also the amount of **capital invested** to generate that profit.

Copeland, Koller and Murrin (1990:142) express this concept by means of the following formula:

$$\text{ROIC} = \frac{\text{NOPAT}}{\text{Invested Capital}}$$

where

ROIC = the operating profits of the company divided by the amount of capital invested in the company;

NOPAT = net operating profits after adjusted taxes; and

Invested Capital = operating working capital + net fixed assets + other assets.

It is beyond the scope of this study to use numerical examples to illustrate the following two facts, but they nevertheless need to be mentioned:

Firstly, a higher return on invested capital (ROIC) results in a higher free cash flow (and thus higher value), given the same growth rate in operating profit; secondly,

an increased growth rate in NOPAT results in lower free cash flows during the initial years (due to the higher amount of net investment), but later the free cash flows become much larger and result in greater value.

As long as the return on invested capital (ROIC) is greater than the weighted average cost of capital (WACC) used to discount the cash flow, higher growth generates greater value. The core idea is thus that the key drivers of value are **return on invested capital** (relative to WACC) and **growth** (Copeland, Koller & Murrin (1990:146).

In Chapter 5 of this study there is a discussion of how these variables must interact with one another and other variables in order to create value.

3.5.3 The economic profit model

Another model, which Copeland, Koller and Murrin (1990:149) call the **Economic Profit Model**, calculates the value of a company by taking the amount of capital invested and adding to that a premium which represents the present value of the value created for each future year.

As far back as 1890, Alfred Marshall recognised the concept of economic profit and stated that the value created by any company must take into account not only the expenses recorded in the financial statements, but also the opportunity cost of the capital employed in the business. This means, *inter alia*, that not only interest on debt must be accounted for when calculating economic profit, but also the required rate of return of the ordinary shareholders, which must appear as a "cost" in the calculations of shareholder value.

One of the **advantages** of the economic profit model over the discounted cash flow models is that economic profit is a useful measure for understanding a company's performance in any **single year**, while free cash flow is not. One cannot track a company's progress by comparing actual and projected free cash flow, as this

performance of a company is determined by highly discretionary investments in fixed and working capital. Management could thus easily manipulate investment decisions (delaying or under-investing) in order to improve free cash flow in a given year (bearing in mind that free cash flow equals NOPAT less Investment). Such manipulation could be to the detriment of value creation (Copeland, Koller & Murrin 1990:149).

Economic profit measures the value created by a company in a single year and can be expressed as follows:

$$\text{Economic Profit} = \text{Invested capital} * (\text{ROIC} - \text{WACC})$$

In other words, the economic profit is calculated by multiplying invested capital by the spread between the return on invested capital and the cost of capital. If a company has invested total capital of R1,000, the return on invested capital is 18% and the WACC is 15%, the company's economic profit for the year is R30:

$$\begin{aligned}\text{Economic Profit} &= \text{R1,000} * (0.18 - 0.15) \\ &= \text{R1,000} * 0.03 \\ &= \text{R30.}\end{aligned}$$

Economic profit translates the value drivers discussed above into a single Rand amount.

Another way to express economic profit is that of after-tax operating profits of the company, less a charge for the **total** capital used by the company:

$$\begin{aligned}\text{Economic Profit} &= \text{NOPAT} - \text{Capital charge} \\ &= \text{NOPAT} - (\text{Invested capital} * \text{WACC})\end{aligned}$$

This alternative calculation gives the same value for economic profit as calculated above:

$$\begin{aligned}\text{Economic Profit} &= R180 - (R1,000 * 0.15) \\ &= R180 - R150 \\ &= R30.\end{aligned}$$

This approach illustrates the difference between accounting profit and economic profit: the economic profit takes into account not only the interest on debt, but on **all** capital.

A simple example will illustrate how economic profit can be used for valuations.

Assume that the hypothetical company in the example above has invested R1 000 in working capital and fixed assets in 19x1. Each year after that, the company earns R180 in NOPAT (therefore it has a 18% ROIC). If the net investment is zero, the free cash flow will also be R180 (R180 - 0) and the economic profit will be R30, assuming a WACC of 15%.

The economic profit approach states that the value of a company equals the amount of capital invested plus the present value of its projected future economic profit (Copeland, Koller & Murrin 1990:150).

$$\text{Value} = \text{Invested capital} + \text{Present value of projected Economic Profit.}$$

If a company earns exactly its WACC during every period (ROIC = WACC), then the discounted value of its projected free cash flow should equal its invested capital. In other words, the value of the company is that amount which was originally invested. The value of a company changes (positively or negatively, value is added or value is destroyed), if it earns more or less than its WACC (ROIC > or < WACC).

The value of the company above should equal R1 000 (its invested capital at the time of the valuation) plus the present value of its economic profit. Since economic profit remains at R30 to infinity, one can use a perpetuity value to calculate the

present value of the economic profit:

$$\begin{array}{rcl}
 \text{Present value of Economic Profit} & = & \begin{array}{r} \text{R30} \\ \text{-----} \\ 0.15 \end{array} \\
 & = & \text{R200.}
 \end{array}$$

The total value of the company is thus $\text{R1 000} + \text{R200} = \text{R1 200}$.

If the projected free cash flow of R180 per year is to be discounted, one arrives at the same value for the company, namely R1 200:

$$\begin{array}{rcl}
 \text{Present value of FCF} & = & \begin{array}{r} \text{R180} \\ \text{-----} \\ 0.15 \end{array} \\
 & = & \text{R1 200.}
 \end{array}$$

The above hypothetical example serves merely to illustrate the principles involved. One can now take a real life example and calculate the economic profit for a number of years. Thereafter the present value of the economic profit can be calculated in a similar way as the free cash flow. After the adjustments for non-operating investments and debt, the equity value will be the same under both methods.

As mentioned previously, the scope of the study neither allows nor necessitates detailed calculations and examples of the above models, as the model that is discussed next carries more weight than any other model discussed in this study.

3.5.4 Evaluation

The Economic Profit Model as developed and presented by Copeland, Koller and

Murrin (1990) takes all the principles of economic profit calculation into account. The model is not only easy to understand, but also give a very clear indication of value drivers (which are the subject of Chapter 5).

A comparison between models discussed in this chapter will be done at the end of Chapter 4. A detailed discussion of the last (and in the author's opinion, the best) model which can be used to calculate the value that a company can create for its shareholders is set out in Chapter 4.

3.6 CONCLUSION

During the 1970's, Stern started to write about the problems encountered with and disadvantages of the accounting-based methods. He was a firm believer in the economic-based methods. It was not, however, until 1986 that his partner, Stewart, in the consulting firm of Stern Stewart, published a book, *The quest for value*, in which his method of determining shareholder value was named "Economic value added (EVA)".

Although all of the models described above are discussed briefly, **EVA** is the method which is concentrated on in this study. It is also used in various ways to calculate the shareholder value created by management for the owners of a firm.

In the chapters that follow, where the various variables that determine shareholder value are analyzed, EVA is once again prominent. EVA will be discussed in the next chapter.

CHAPTER 4

MEASURING SHAREHOLDER VALUE THE ECONOMIC WAY - ECONOMIC VALUE ADDED

4.1 INTRODUCTION

Economic Value Added (EVA) is a measure of corporate performance developed, refined and popularized by Stern and Stewart of the New York based consulting firm, Stern Stewart & Co over almost 20 years of working together.

Stern (1994:46) admits that the financial concepts which underlie EVA were, of course, not invented at Stern Stewart & Co. Economists since Adam Smith have concluded that the goal of any firm and its managers should be to maximize the firm's value for its owners. Nobel laureate Merton Miller refocused this goal as the goal of maximizing Net Present Value (NPV). Whilst NPV is primarily a long-term capital budgeting tool, EVA is an attempt to break this concept down into annual (or even monthly) instalments which can be used to evaluate the performance of corporate managers and their businesses.

Most companies use discounted cash flow analysis for capital budgeting evaluations, but, when it comes to measuring overall corporate performance and communicating with investors, companies use measures such as earnings, earnings per share, return on equity (ROE) and the like (Stern 1994:51).

The "Du Pont Formula" or return on investment (ROI) is used by many companies when they wish to evaluate operating performance and capital expenditure. The ROI calculation can be broken down into more manageable components such as profit margins, sales turnover and then these components are analyzed even further. The outcome of this Du Pont analysis has been a proliferation of financial measures.

Why is it important to have only one measure? Corporate managers in large listed companies can acquire more capital in order to spend and grow the empire.

Internal competition for capital - where different yardsticks are used in the evaluation - then arises in the company. There are no real trustworthy financial management system which provides consistent results constantly for operating heads to choose only those projects that will increase value (Stern 1994:52).

An EVA financial management system is designed to eliminate the above problem. EVA is a financial management **system**. It is a framework for all aspects of financial decision-making that are anchored by an incentive compensation plan.

4.2 CONCEPTS UNDERLYING EVA

Corporate managers have capital provided by the owners of the business at their disposal. Capital is a scarce resource and therefore it should be assigned to those undertakings that offer the highest returns. To increase the company's share price, managers must earn rates of return on capital that exceed the returns offered by other companies. In this way, they add value to the capital, which is often reflected in the share price.

Of the factors that account for a company's market value and that are discussed in detail in Chapter 5, two factors (which flow from the discussion in Chapter 3 above) stand out. These two, the relation between the rate of return and the cost of capital, often account for a large portion of a company's market value (Stewart 1990:71). This now raises the question: What is the best way to measure a company's rate of return?

Some problems with regard to return on equity (ROE) have been discussed in Chapter 2. In addition, ROE is based on the same accounting earnings (with all their problems, disadvantages and distortions) as discussed in Section 3.1.

EVA adjusts reported accounting earnings to eliminate distortions encountered when measuring true economic performance. Stewart (1994:73) states that, in defining and redefining the EVA measure, a total of 164 performance measurement

factors, including methods of addressing shortcomings in conventional General Accepted Accounting Practice (GAAP) accounting, has been identified. These factors include those addressed in Section 3.1 of this study. No single company is likely to encounter all 164 factors. In practice as few as five to ten key adjustments are actually made. Adjustments can be made only in those cases that meet four criteria:

- a) Is it likely to have a material impact on EVA?
- b) Can the managers influence the outcome?
- c) Can the operating people understand it?
- d) Is the required information relatively easy to track or derive?

The point is that, for any one company, the definition and calculation of EVA is highly customized in order to strike a practical balance between simplicity and precision (Stewart 1994: 74).

4.2.1 The rate of return on total capital

Instead of using ROE, the rate of return on **total** capital can be used as the yardstick to assess corporate performance. This can be computed by dividing a firm's net operating profit after taxes (NOPAT) by total capital employed in the business. This may now be compared directly with the company's cost of capital in order to determine whether value is being created or destroyed (Stewart 1990:86).

$$r = \frac{\text{NOPAT}}{\text{capital}}$$

Capital is the sum of all cash invested in the business over time and in any form or by any name whatsoever. NOPAT is the profit derived from operations, after tax, but before financing charges (interest, dividends) and other non-cash items (e.g. depreciation).

The rate of return on capital may be computed either from a financing or from an operating perspective. Because of the importance of EVA in this study, both these methods are discussed below in Section 4.2.2 and Section 4.2.3.

4.2.3 The rate of return from a financing perspective

The rate of return (r) is, from a financing perspective, free from any distortions which debt (leverage) can inflict upon the standard ROE.

Consider the following calculation of the rate of return:

$$r = \frac{\text{NOPAT}}{\text{capital}}$$

where

NOPAT

- = Income attributable to ordinary shareholders
- + Interest payments after tax savings

Capital

- = Common equity
- + Debt

The NOPAT return on capital is what the return on equity would be, assuming that only equity financing has been employed (Stewart 1990:87). The return (r) is thus free from any financial leverage actions. The benefit of debt manifests itself in the weighted average cost of capital (c) against which the return (r) is compared.

In order to illustrate this important principle, consider the following hypothetical example:

	COMPANY A ----- ALL EQUITY -----	COMPANY B ----- R10,000 DEBT -----
Earnings before interest and tax	10 000	10 000
Interest	0	1 800
	-----	-----
Net profit before tax	10 000	8 200
Less Tax @ 40%	4 000	3 280
	-----	-----
Net profit after tax	6 000	4 920
Debt	0	10 000
Equity	20 000	10 000
	-----	-----
Capital	20 000	20 000
Net profit after tax	6 000	4 920
Equity	20 000	10 000
ROE	30%	49.2%
Net profit after tax	6 000	4 920
Interest	0	1 800
(Taxes saved)	0	(720)
	-----	-----
NOPAT	6 000	6 000
Capital	20 000	20 000
r	30%	30%

As can be seen in the above example, NOPAT, as well as NOPAT return on capital (r), remains **unchanged** by leverage. What matters is the amount of capital employed, and not in what form that capital has been obtained.

The next step to improve the rate of return is to eliminate other financing distortions. This is done by taking into account preferred shareholders interest as well as minority investors.

$$r = \frac{\text{NOPAT}}{\text{capital}}$$

where

NOPAT

- = Income attributable to ordinary shareholders
- + Preferred dividend
- + Minority interest provision
- + Interest payments after tax savings

and

Capital

- = Common equity
- + Preferred share capital
- + Minority interest
- + Debt

Note that for every adjustment to NOPAT, there is a corresponding adjustment to capital. The NOPAT as calculated above is the amount available to all providers of capital to the business (Stewart 1990:90).

The final step in adjusting the rate of return (r), is the elimination of accounting distortions. Equity equivalents (EE) convert the standard accounting book value to the so-called economic book value, which is a more accurate reflection of the cash that investors have risked in the firm and on which they expect a return.

Equity equivalents add back to capital such items as the deferred tax reserve, the cumulative amortization of goodwill, a capitalization of R & D (and other intangibles, such as the cost of designing and promoting new products) and other reserves such as the bad debt reserve, the stock obsolescence reserve and the deferred income reserve.

$$r = \frac{\text{NOPAT}}{\text{capital}}$$

where

NOPAT

- = Income attributable to ordinary shareholders
- + Increase in equity equivalents

ADJUSTED NET INCOME

- + Preferred dividend
- + Minority interest provision
- + Interest payments after tax savings

and

Capital

- = Common equity
- + Equity equivalents

ADJUSTED COMMON EQUITY

- + Preferred share capital
- + Minority interest
- + Debt

With the incorporation of equity equivalents into capital and NOPAT, the rate of return is an even more accurate indication of the yield earned by all the capital providers of the business.

4.2.3 The rate of return from an operating perspective

The rate of return on capital (r) can also be calculated from an operating perspective.

Capital can be defined as the net fixed assets (land and buildings, plant and equipment and other long-term capital necessary to run the business) plus current assets less non-interest-bearing liabilities (such as accounts payable and accrued expenses that arise as spontaneous sources of finance in the normal course of business).

To obtain the same measure of capital as the financing approach, adjustments must be made to assets for certain equity equivalent reserves (e.g. by adding the bad debt reserve to debtors, the cumulative amortization of goodwill to goodwill and the balance of capitalized intangibles to net fixed assets and so on)

(Stewart 1990: 93). This is the section of the balance sheet labelled "Employment of Capital". This section must of course balance with the section called, "Capital Employed".

From an operating perspective, NOPAT is, just as its name indicates, the net operating profit after tax. If one starts with net sales, from which all cash economic operating expenses including depreciation gets deducted, it leaves net operating profit from which cash taxes on this residual amount are deducted.

This cash tax amount can be approximated as follows: accounting provision for taxes **less** deferred tax not paid **plus** the tax on interest payments (which shelters operating profits from a bigger tax burden), plus taxes on dividends.

$$r = \frac{\text{NOPAT}}{\text{capital}}$$

where

NOPAT

- = Sales
- Operating expenses
- Taxes

and

Capital

- = Net working capital
- + Net fixed assets

4.3.4 Concluding remarks

A business that wants to add value to the capital it employs for its shareholders (investors), must earn a rate of return that exceeds the cost of capital of the business.

Measures such as ROE are a flawed measure of performance, due to distortions resulting from accounting conventions that make financial statements more useful for lenders than for shareholders.

The rate of return on **total** capital should be used to measure corporate performance. This can be obtained by dividing NOPAT by the capital employed in operations. Stewart (1990:111) called this an "after-tax cash-on-cash" yield earned in the business. It is a measure of the productivity of the capital employed in the business, irrespective of the method of financing used and free from accounting distortions arising from accrual bookkeeping entries.

It is the relationship between this rate of return (r) and the cost of capital that forms one of the EVA method.

4.3 EVA DEFINED

4.3.1 The theoretical model

As can be deduced from the introductory discussion above on the principles underlying EVA, in essence, EVA is a way of measuring the economic value (profitability) of a business after the **total** cost of capital - both debt **and** equity - has been taken into account. One must remember that most traditional (accounting-based) methods take only debt into account. The calculation of EVA also includes the often considerable cost of equity (Firer 1995:57).

The main shortcomings of other methods have been dealt with briefly. The key principle of EVA is that value is created when the return on an investment exceeds the total cost of capital that correctly reflects its investment risk. One can improve EVA (and thus shareholder value) as long as one accepts new projects on which the rate of return exceeds the cost thereof.

EVA is an **internal** performance measure of a company's operations on a year-to-year basis. It reflects the successes of the efforts of corporate managers to add value to the shareholders' investment.

EVA is the residual income left over from the operating profits after the total cost of capital has been subtracted. A **positive** EVA implies that the rate of return on capital **must** exceed the required rate of return. To the extent that a company's EVA is greater than zero, the firm is creating (adding) value for its shareholders (Stern 1994:49).

EVA is a kind of annual instalment of the multi-year Net Present Value (NPV) that is calculated by using the standard discounted cash flow capital (DCF) budgeting

technique. The similarity between EVA and NPV lies in the fact that they both measure the degree to which a firm is successful in earning a rate of return that exceeds the cost of capital. It is, however, demonstrated later in this chapter that EVA is a far better tool for the job than NPV or DCF, even though these methods, if properly applied, result in the same answers over an extended period of time.

EVA is arguably the only measure that properly accounts for all the complex trade-offs involved in creating value. It is computed by taking the spread between the rate of return on capital (r) (as calculated in Section 3.6.1.1) and the cost of capital (c) and then multiply this with the economic book value of the capital committed to the business (Stewart 1990:136):

$$\text{EVA} = (\text{rate of return} - \text{cost of capital}) \times \text{capital}$$

$$\text{EVA} = (r - c) \times \text{capital}$$

If, for example, NOPAT is R500, capital is R2 000 and c is 15%, then r (NOPAT/capital) is 25% and EVA is R200:

$$\begin{aligned} \text{EVA} &= (r - c) \times \text{capital} \\ &= (0.25 - 0.15) \times 2\,000 \\ &= \text{R}200 \end{aligned}$$

Although there are countless individual actions in a business that employees can perform to create value, eventually they all fall in one of the three categories (r , c and capital) captured by EVA. EVA increases when operating efficiency is enhanced, when value enhancing investments are undertaken, and when capital is withdrawn from unrewarding activities.

To be more specific, EVA increases when:

- a) the rate of return (r) earned on the existing capital base improves; that is, the operating margin increases without investing more capital;
- b) additional capital is invested in projects that earn a rate of return (r) greater than the cost of capital (c); and
- c) capital is liquidated from unrewarding projects (where $r < c$).

These are the only ways in which shareholder value can be created, and EVA captures them all.

EVA can also be expressed in another way, by multiplying both r and c with capital:

$$\begin{aligned} \text{EVA} &= (r - c) \times \text{capital} \\ &= (r \times \text{capital}) - (c \times \text{capital}) \\ &= \text{NOPAT} - (c \times \text{capital}) \\ &= \text{operating profits} - \text{a capital charge} \end{aligned}$$

EVA is therefore residual income, or operating profits, less a capital charge. The company is in effect charged by its capital providers (which includes shareholders and debt providers) for the use of capital at an interest rate of c (cost of capital) (Stewart 1990:137).

The preceding example can also be presented in this format. Bear in mind that with an r of 25%, c of 15% and capital employed of R2 000, EVA was R200.

FORMERLY

$$\begin{aligned} \text{EVA} &= (r - c) \times \text{capital} \\ &= (0.25 - 0.15) \times 2\,000 \\ &= \text{R}200 \end{aligned}$$

NOW

$$\begin{aligned} \text{EVA} &= \text{NOPAT} - (c \times \text{capital}) \\ &= (r \times \text{capital}) - (c \times \text{capital}) \\ &= (0.25 \times 2\,000) - (0.15 \times 2\,000) \\ &= 500 - 300 \\ &= \text{R}200 \end{aligned}$$

From this, one can see that NOPAT = R500, and the capital charge, or interest, is R300. EVA represents the residual of R200.

According to Stewart (1990:138) the three EVA strategies can now be stated as follows:

- a) improve operating profit (or operating margin) without tying up any more capital;
- b) invest more capital, as long as the return on the additional capital is more than the capital charge to be paid ($r > c$); and
- c) reduce or disinvest capital whenever $c > r$, and the resultant earnings lost are more than offset by the savings on the capital charge.

These three value-creating strategies can be illustrated by means of numerical examples.

Base case:

The base case starts with a NOPAT of R500, capital of R2 000 and c of 15%. From this, r is calculated at 25% and EVA at R200:

$$\begin{aligned} \text{EVA} &= (r - c) \times \text{capital} \\ &= (0.25 - 0.15) \times \text{R}2\,000 \\ &= \text{R}200 \end{aligned}$$

Value-creating strategy (a): Improve operating efficiency

NOPAT increases to, say, R600 due to administrative savings or greater efficiency in the production process. Then r increases to 30% (R600/R2 000), and EVA increases to R300:

$$\begin{aligned} \text{EVA} &= (r - c) \times \text{capital} \\ &= (0.30 - 0.15) \times \text{R2 000} \\ &= \text{R300} \end{aligned}$$

Value-creating strategy (b): Achieve a profitable investment

A proposed new project requires a capital investment of R1 000 and is expected to earn a rate of return of 20% and thereby adding R200 to NOPAT. In this case, r is 23% (R700/R3 000) and EVA increases to R210:

$$\begin{aligned} \text{EVA} &= (r - c) \times \text{capital} \\ &= (0.23 - 0.15) \times \text{R3 000} \\ &= \text{R210} \end{aligned}$$

Note in this case that although the rate of return decreases from 25% to 23%, EVA increases from R200 to R210.

Value-creating strategy (c): Rationalize and curtail unproductive investments

(c)(1) Liquidate unproductive capital

R500 of excess working capital can be withdrawn from business operations without affecting NOPAT. This causes the rate of return to increase to 33% (R500/R2 000-R500) and EVA to R270:

$$\begin{aligned}\text{EVA} &= (r - c) \times \text{capital} \\ &= (0.33 - 0.15) \times \text{R1 500} \\ &= \text{R270}\end{aligned}$$

(c)(2) Curtail investment in unrewarding projects

Start with a completely new case. Assume that a company earns a NOPAT of R200 on R2 000 capital. With a return of only 10%, EVA is negative R100:

$$\begin{aligned}\text{EVA} &= (r - c) \times \text{capital} \\ &= (0.10 - 0.15) \times \text{R2 000} \\ &= -\text{R100}\end{aligned}$$

Suppose now that the company has the opportunity to undertake a new project with a capital investment of R1 000 and a return of 13%, therefore adding R130 to NOPAT. The consolidated return increases to 11% (R330/R3 000) but EVA declines further, to negative R120:

$$\begin{aligned}\text{EVA} &= (r - c) \times \text{capital} \\ &= (0.11 - 0.15) \times \text{R3 000} \\ &= -\text{R120}\end{aligned}$$

Although the rate of return increases, more value is destroyed for the shareholders.

In addition to the above cases, another value-creating option for a firm is mentioned briefly.

Value-creating strategy : Changing the cost of capital (c)

Starting with the first base case again, suppose that the company is able to substitute some of its high cost capital for lower cost capital (by increasing its debt ratio). This results in an interest bill saving of, say, R50 and a reduction in c to,

say, 12%. NOPAT now drops (remember that NOPAT = attributable income + interest expense after tax, and therefore a lower interest bill will lower NOPAT) with $R50 \times (1 - \text{Tax rate})$, say, a total of R30. The rate of return is now 24% ($(R500 - R30) / R2,000$) and EVA increases to R240:

$$\begin{aligned} \text{EVA} &= (r - c) \times \text{capital} \\ &= (0.24 - 0.12) \times R2\,000 \\ &= R240 \end{aligned}$$

These calculations demonstrate how the EVA of a company can be determined, as well as how changes in the three inputs in the formula bring about a change in the value created or value destroyed.

However, EVA must at this stage be put to another test. If EVA is a good performance measure, it ought to be able to set apart or distinguish between the value-creation efforts of competing companies.

Consider the following cases of Companies A, B and C:

	A	B	C
(r - c)	15% - 15%	17.5% - 15%	17.5% - 15%
x increase in Capital	R1 000	R 800	R2000
	-----	-----	-----
Incremental EVA	R 0	R 20	R 50

These calculations can now be presented on a more detailed year-to-year basis in order to illustrate the principle of an ongoing EVA calculation and comparison between companies:

EVA for companies A, B and C

	19x1	19x2	19x3	19x4
	-----	-----	-----	-----
<u>Company A</u>				
1. NOPAT/Beg capital r	15%	15%	15%	15%
2. WACC c	15%	15%	15%	15%
3. Spread r-c	0%	0%	0%	0%
4. x Beginning Capital	R10 000	R11 000	R12 100	R13 310
5. EVA	R0	R0	R0	R0
6. Increase in EVA		R0	R0	R0
<u>Company B</u>				
1. NOPAT/Beg capital r	17.5%	17.5%	17.5%	17.5%
2. WACC c	15%	15%	15%	15%
3. Spread r-c	2.5%	2.5%	2.5%	2.5%
4. x Beginning Capital	R8 000	R8 800	R9 680	R10 648
5. EVA	R200	R220	R242	R266
6. Increase in EVA		R20	R22	R24
<u>Company C</u>				
1. NOPAT/Beg capital r	17.5%	17.5%	17.5%	17.5%
2. WACC c	15%	15%	15%	15%
3. Spread r-c	2.5%	2.5%	2.5%	2.5%
4. x Beginning Capital	R8 000	R10 000	R12 500	R15 625
5. EVA	R200	R250	R313	R391
6. Increase in EVA		R50	R63	R78

EVA is obtained by multiplying the spread between r and c by the capital invested. Incremental EVA is determined by the increase in EVA, or the $r - c$ spread multiplied by the increase in capital.

Various scenarios have been presented above to illustrate the calculation of EVA. The possibilities are by no means exhausted and are dealt with in more detail in Chapter 5 of this study, which concentrates on the variables determining EVA.

At this stage, it should be clear that the EVA valuation procedure is not a far-fetched new method or theory of valuation; it is just a form of the discounted cash flow method. It is a mathematical truism that, for a given forecast, the value determined by discounting projected EVA and adding it to the current capital balance, equals the value computed by discounting the anticipated free cash flow to a present value (Stewart 1990:175).

The above hypothetical examples were used in conjunction with the theoretical principles to demonstrate the basic mechanics of Economic Value Added as a valuation and performance measurement tool.

One can now develop and expand the EVA method by introducing present value discounting into the process.

4.3.2 Explanatory calculations

The EVA valuation method calculates how much value has been and will be created (or destroyed). When a company's EVA is projected and discounted to a present value, EVA accounts for the market value that management has added or subtracted from the capital at its disposal:

$$\text{Value} = \text{Capital} + \text{Present Value of all future EVA}$$

Value is calculated in three steps. Firstly, the annual EVA-values are discounted to the present value. Secondly, one must provide for the period **beyond** the time span (T) under review. This is done by capitalizing the NOPAT achieved in the first year after T as a perpetuity and then discounting it to the present. Lastly, one adds current capital (in year 0, the beginning of the valuation period) to the discounted EVA values.

Normal capital budgeting techniques often assume that cash flows occur at the end of the period, and therefore do not adjust the discount factor or the cash flows for re-investing the cash flows at any time throughout the year. However, it makes more sense to assume that the cash flows that occur during the year can be re-invested at some rate.

For the purposes of the example below midyear discounting is used at the cost of capital and the discount factor is adjusted accordingly. This implies that the capital at the beginning of the period must be adjusted to midyear by adding half a year's interest at the cost of capital rate (discount rate).

The value of Company A will be determined by discounting its EVA:

	19x1	19x2	19x3	19x4
	-----	-----	-----	-----
<u>Company A</u>				
NOPAT	R1 500	R1 650	R1 815	R1 997
Beginning Capital	R10 000	R11 000	R12 100	R13 310
NOPAT/Beg capital r	15%	15%	15%	15%
WACC c	15%	15%	15%	15%
Spread r-c	0%	0%	0%	0%
x Beginning Capital	R10 000	R11 000	R12 100	R13 310
EVA	R0	R0	R0	R0
PV factor at 10%	0.9535	0.8668	0.7880	0.7131
PV of EVA	R0	R0	R0	R0
Cumulative PV of EVA	R0	R0	R0	R0
Capital				<u>R10 488</u>
Value				R10 488

With projected returns equal to required returns, no value is added to capital. Company A is worth the current capital employed and no more.

Next, consider the case of Company B:

	19x1	19x2	19x3	19x4
	-----	-----	-----	-----
<u>Company B</u>				
NOPAT	R1 400	R1 540	R1 694	R1 863
Beginning Capital	R8 000	R8 800	R9 680	R10 648
NOPAT/Beg capital	r 17.5%	17.5%	17.5%	17.5%
WACC	c 15%	15%	15%	15%
Spread	r-c 2.5%	2.5%	2.5%	2.5%
x Beginning Capital	R8 000	R8 800	R9 680	R10 648
EVA	R200	R220	R242	R266
PV factor at 10%	0.9535	0.8668	0.7880	7.880
PV of EVA	R191	R191	R191	R2 096
Cumulative PV of EVA	R191	R382	R573	R2 669
Capital				<u>R8 390</u>
Value				R11 059

The rate of return on capital is a steady 17.5% and it exceeds the cost of capital of 15% by a constant 2.5% per year. This causes EVA to increase at the rate at which capital invested grows, namely 10%. The discounted value of the EVA remains the same due to the fact that the growth rate in the EVA equals the discount rate. The present value of EVA of R266 as a perpetuity is estimated at R2 096, and the total accumulated value of EVA of R2 669 is the value created or added by management to the capital at their disposal. Adding this capital to the value created from it yields the total value of the company.

Finally, let us consider the valuation of Company C:

	19x1	19x2	19x3	19x4
	-----	-----	-----	-----
<u>Company C</u>				
NOPAT	R1 400	R1 750	R2 188	R2 734
Beginning Capital	R8 000	R10 000	R12 500	R15 625
NOPAT/Beg capital r	17.5%	17.5%	17.5%	17.5%
WACC c	15%	15%	15%	15%
Spread r-c	2.5%	2.5%	2.5%	2.5%
x Beginning Capital	R8 000	R10 000	R12 500	R15 625
EVA	R200	R250	R313	R391
PV factor at 10%	0.9535	0.8668	0.7880	7.880
PV of EVA	R191	R217	R247	R3 081
Cumulative PV of EVA	R191	R408	R655	R3 736
Capital				<u>R8 390</u>
Value				R12 126

Company C creates value as measured by its EVA at a higher rate than the other two contenders. Although its spread between r and c is similar to that of Company B, its growth rate in terms of NOPAT is very high at 25%. It is also interesting to note that the Free Cash Flow (FCF) of Company C (NOPAT less I , incremental capital) is negative.

4.3.3 Standardized EVA

Despite all the advantages of EVA as a performance measure, one could refine EVA more in order to use it for a comparison between companies or business units of different sizes. Also, certain industries are more capital intensive than others and

there is a need for a common basis for comparison. EVA can be standardized to reflect a common level of capital employed.

In order to standardize EVA, the **capital employed** needs to be standardized to a base year. The spread ($r - c$) is not affected by the scaling. The capital employed in the first year is divided by itself (the base year capital employed) and multiplied by 100. Thus, the standardized EVA in the first year of the analysis is always equal to the spread between that year's r and c multiplied by 100.

In the second year of analysis, that year's capital employed is divided by the base year's capital employed, multiplied by 100 and multiplied in turn by the spread in order to attain the standardized EVA of the second year. This process is repeated for every year for the entire period under review.

Standardized EVA increases if the spread ($r - c$) is increased, new capital is invested productively, or if capital is withdrawn from uneconomical activities.

Shortcomings, distinctions and comparisons between companies show up more clearly when EVA is standardized in this way. These characteristics are utilized in the empirical part of this study.

4.3.4 Concluding remarks

A detailed evaluation of EVA as a performance measure is done at the end of this chapter. However, at this stage, after the above hypothetical examples, one can mention a number of features of this model.

In the first place, EVA reduces all the ways in which a company can create value to only three: Measuring the efficiency of current operating activities, taking profitable growth into consideration and eliminating uneconomical activities (both in terms of operating and capital investment).

Secondly, when projected and discounted to a present value, EVA represents the net present value of all past and projected capital projects. Thus, maximizing EVA as a company objective is not only compatible with the overall goal of the firm, but such a step will ensure that the share price continues to grow as the stock market price exceeds the capital investment in the firm.

Although EVA yields the same value as discounting the free cash flow, EVA as a measure is better in the sense that it connects forward-looking valuation procedures with an evaluation of performance (Stewart 1990: 178).

4.4 MARKET VALUE ADDED

4.4.1 Introduction

Market value added (MVA) was also developed at the Stern Stewart consultancy firm. Although this is another method of determining the value of a company, it is dealt with under the heading of EVA, as there is a close relationship between these two concepts.

Companies can be ranked according to how much value they have added to, or subtracted from, their shareholder investment. Market value added is the difference between a company's fair market value, as reflected primarily in its share price, and the economic book value of capital employed. Readers are at this stage reminded of the difference between the economic book value and the accounting book value, as discussed in Sections 3.1 and 3.2 above, as well as in Chapter 2.

The economic book value is bound to be considerably larger than the accounting book value as indicated in the annual financial statements. Besides the conventional book equity (share capital, share premium, retained earnings and reserves) it also includes equity equivalent reserves (bad debt and LIFO reserves, the capitalization of R&D and deferred tax to name but a few) to provide a more accurate indication of the shareholders' total cash investment in the company (Stewart 1990 :180).

The concept of market value added can be expressed in a simple formula:

$$\text{Market value added} = \text{market value} - \text{capital}$$

If a company has a market value of R500m, but has capital to the worth of R600m invested, it has a **negative** MVA of R100m. However, if the same company only had R300m in invested capital, the managers of the company would have added R200m in value to the investors' capital at their disposal.

From the above, one can deduce that a company's MVA is the share market's assessment, at any given time, of how successfully the company has invested its capital in the past and how successfully investors expect the capital to be invested in future. Maximizing a company's MVA is thus synonymous to maximizing shareholder value, which is the goal of the firm.

MVA can also be calculated by multiplying the number of shares issued by the difference between the market price of the shares and the economic book value of the shares:

$$\begin{aligned} \text{MVA} &= \text{number of shares} * (\text{market price} - \text{economic book value per share}) \\ &= \text{share market value} - \text{economic book value (capital)} \end{aligned}$$

The economic book value consists of the economic capital as we defined it for the purposes of calculating a company's EVA. Adding equity equivalents to capital, adjusts MVA for the many distortions that can cause an overstatement of value created by capital intensive, high-tech or risky companies. These factors may be discounted in the share price at the left hand side of the above equation, and, unless is accounted for, on the other side of the formula, value (MVA) will also be overstated.

It is also important to note that it is not **total value** (market capitalization, the first term in the MVA calculation) that counts. This would be an incomplete

measurement of corporate performance, as it does not take into consideration the amount of capital used to create that value. A company can increase its total value by investing more capital (both by retaining earnings and raising new capital in whatever form). The efficient use of the shareholder's capital can only be measured according to **net** present values - that is, the total value **less** the total capital used, or the **increase** in value, less the **additional** new capital invested in the business (Stewart 1990:190).

Changes in the levels of MVA over a given period are bound to be as useful (if not more so) than the total levels of MVA itself. An increase in MVA is a sign that a company is producing higher rates of return on capital than the cost of that capital. The opposite happens when the return of capital is lower than the cost thereon: a negative MVA is accorded to a company, its managers and its shareholders.

The above argument indicate the link between EVA and MVA as two valuation concepts. It is this link that forms the subject of the discussion in the next section.

4.4.2 MVA and EVA

EVA can be viewed as that **internal** measure of performance that best reflects the company's success in adding value to the capital invested by shareholders. It is therefore strongly related to both the **level** and the **changes** in MVA over time.

As explained above, EVA is the residual income left over from operating income after the cost of capital has been deducted. According to Stewart (1990:192), EVA can also be thought of as the economic earnings that are capitalized by the market in arriving at a company's MVA. The MVA can therefore be regarded as the **external** or "market" measure of performance of a company's success. However, the link between a company's EVA and MVA goes further. It can, in fact, be expressed mathematically. A company's market value added at any point in time is equal to the discounted present value of all the EVA the company is expected to generate in the future.

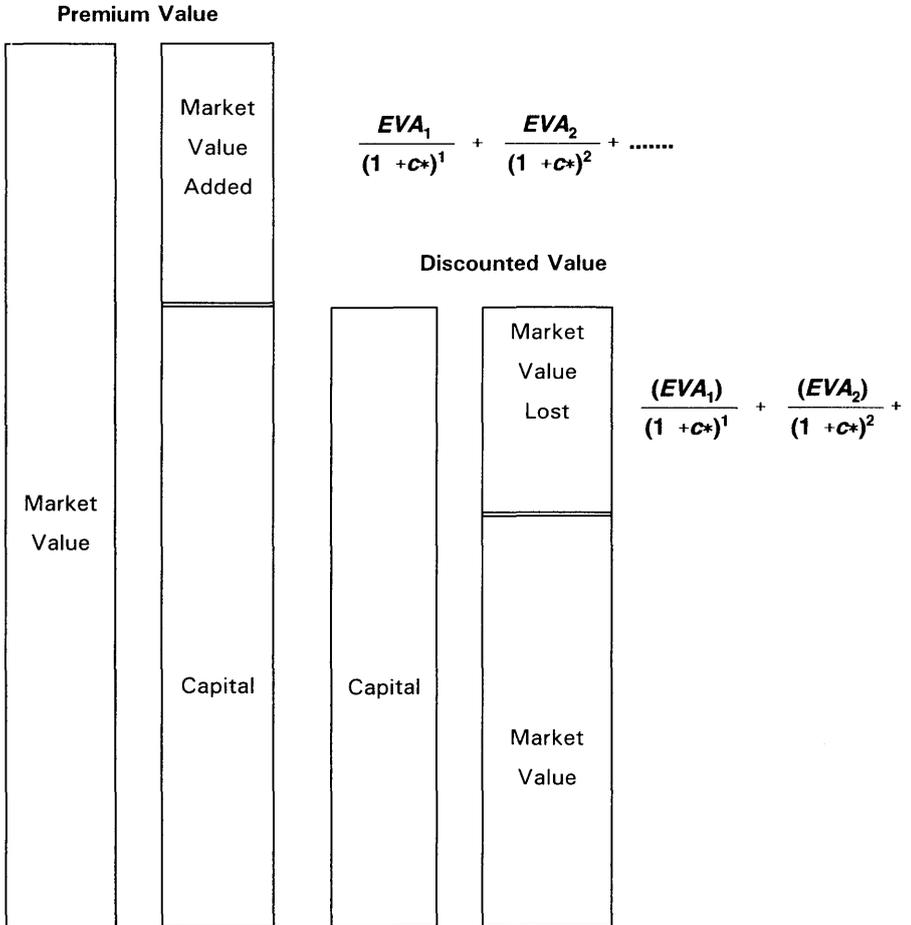
Thus, companies that earn exactly their cost of capital have an EVA of RO and sell at a market value equal to capital, and therefore have as MVA zero. Companies that earn in excess of their cost of capital are rewarded by the market with positive MVAs (in line with the positive EVAs that can be computed from their results).

MVA = market value - capital

MVA = present value of all future EVAs

Stewart (1990:153) describes a company's EVA as the fuel that fires its MVA. EVA is the internal measure which leads to the external consequence of building a premium or discount into the market value of a company. Diagrammatically, this can be expressed as follows:

The Relationship Between EVA and MVA



It is difficult to illustrate the calculation of a company's MVA by means of a hypothetical example as key variables also need to be estimated. In the following section, a real life example is used. However, as a run-up to this, consider the following illustration which is an extension of the calculations of EVA done in Section 4.3.1 above:

MVA FOR COMPANY C

(Data in Rm)	19x1	19x2	19x3	19x4
	-----	-----	-----	-----
1. NOPAT/Beg capital r	17.5%	17.5%	17.5%	17.5%
2. WACC c	15%	15%	15%	15%
3. Spread r-c	2.5%	2.5%	2.5%	2.5%
4. x Beginning Capital	R8	R10	R12.5	R15.625
5. EVA	R0.20	R0.25	R0.31	R0.39
6. Share Price	R10	R11	R13	R15
7. "Econ" B V/Shr	R3	R5	R6	R6
8. Price - Book	R7	R6	R7	R9
9. x No. Shares Issued	20	20.5	22	23
10. MVA	R140	R123	R154	R207

From these calculations, one can see that the variables that determine a company's MVA are, in essence, the share price, the economic book value per share and the number of shares issued. It is especially the last two variables that lead to the calculation of **total capital invested** as used in determining the EVA.

A company's MVA can thus be increased in the same three ways that the EVA is increased, namely (a) by increasing the efficiency of current operations and thereby increasing the spread between r and c ; (b) by increasing the amounts of capital invested in projects with positive spreads between r and c ; and (c) by withdrawing capital from projects or operations where the spread between r and c is negative. The share market tends to be forward-looking, and therefore changes in MVA often anticipate changes in EVA. Changes in EVA and MVA do not correspond exactly at any given point in time, but the general trend is more often than not the same with the MVA being the leading indicator and the EVA lagging behind. The

correlation between these two valuation concepts is discussed in Section 4.4.5 of this study.

4.4.3 Standardized MVA

The MVA can also be standardized and then related to EVA. Stewart (1990:173) standardizes the **number of shares issued** on the same principle as capital employed was standardized in the calculation of standardized EVA.

The actual number of shares issued is divided by the capital employed at the end of the first year (the base figure) and then multiplied by 100. This adjusted (standardised) amount of shares issued is multiplied by the difference between the market value and the book value per share in order to arrive at the standardized MVA.

In the second year, the actual number of shares issued is once again divided by the capital employed at the end of the first year, then multiplied by 100 to arrive at the standardized number of shares issued, and the rest of the calculations are completed to obtain the standardized MVA.

Note that in standardizing EVA, capital employed at the **beginning** of the first year is used, whilst in standardizing MVA, it is the capital at the **end** of the period that is used. The reason for this is twofold. Firstly, it takes time for capital to become fully productive and, secondly, MVA is calculated using the share price as it is reflected at the end of the year.

Standardized MVA is utilized extensively in the empirical part of this study.

4.4.4 The Q-ratio

There is another method very similar to the MVA method, namely the **Q ratio**. This ratio was developed in the 1960s by Nobel Prize winning economist James Tobin.

The ratio is calculated by adding the market value of a company's equity (both ordinary and preference shares), debt and other long-term liabilities together. This is expressed against the current value of the company's asset base (comprised of the net assets and working capital, adjusted for inflation) (Ryan 1994:16).

Companies with a ratio greater than one have been able to add value to the assets under their control, while those with a ratio of less than one have destroyed value.

Companies can improve their ratio by good asset management (for example by reducing stock levels), rationalisation (of both assets, costs or product range), restructuring and cost containment in order to improve margins.

From the above one can see the similarities with EVA and MVA more clearly. The same factors that influence EVA also come into play with the Q ratio. Stewart (1990:181), in elaborating on MVA, states that he focuses on the market value of a company's total debt and equity in relation to the capital employed in assets (though no mention is made of whether assets are adjusted for inflation or not). Managers are really managers of assets and not of equity.

This study, however, concentrates, *inter alia*, on MVA as a measure of shareholder wealth.

4.4.5 Concluding remarks

MVA is the absolute Rand spread between a company's market value and total capital invested. Unlike a rate of return, which reflects the outcome of one period, MVA is a cumulative measure of corporate performance. It is the wealth created by management over and above the total resources invested. MVA can also be regarded as the market's assessment of the quality of management (Stern 1994: 43).

The close relationship between a company's EVA and MVA originates from the fact that these measures are based on the same underlying principles, concepts and amounts. MVA, which is forward-looking, is closely associated with historical EVA.

If managers strive to maximize a company's EVA, MVA automatically follows, as does the improvement in shareholder value. Maximizing MVA should be the primary objective for the management of a company that is concerned about its shareholders' wealth (Stewart 1990:153).

4.5 EVA CALCULATION OF SASOL (LTD).

As an example, a calculation of the EVA of Sasol LTD is presented overleaf:

ECONOMIC VALUE ADDED (EVA) (1992/1993)

REFER NOTE

1. RETURN ON CAPITAL EMPLOYED (ROCE)

$$\frac{\text{Net Operating Profit after Tax (NOPAT)}}{\text{Beginning Capital}} \times \frac{100}{1}$$

$$\frac{1\ 614}{19\ 987} \times 100$$

$$= 8.1\%$$

2. SPREAD

Return on Capital employed - Weighted Average Cost of Capital **5***

$$= \text{ROCE} - \text{WACC}$$

$$= 8,1 - 18,1$$

$$= \underline{(10\%)}$$

3. ECONOMIC VALUE ADDED (EVA)

Beginning Capital x Spread

R19 987 million x (10%)

$$= \underline{\text{R1 998 million}} \text{ Shortfall}$$

MARKET VALUE ADDED (MVA)
(1992/1993 - FINANCIAL STATEMENTS)

	REFER NOTE	R'MILLION 1993	1992
1. ADJUSTED BOOK VALUE OF EQUITY			
Ordinary Shareholders' Interest	1	6 781	5 961
Cumulative extraordinary loss/gain (Note 17 - Cash flow statement: Adjustment for loss/(profit) on disposal of fixed assets)	CFS	(3)	(2)
LIFO reserve	2	343	311
Goodwill (Coal Mining assets at book value (Refer note 1))	B/S	1 582	1 403
Inflation adjustment - other fixed assets	3	<u>10 758</u>	<u>8 929</u>
Adjusted Book Value of equity		<u>19 461</u>	<u>16 602</u>
Minority interest	B/S	91	76
Total long-term capital		2 520	2 850
- Long-term liabilities	B/S	1 492	1 822
- Convertible debentures	B/S	1 028	1 028

Short-term borrowings	B/S	<u>578</u>	<u>459</u>
Non-equity components of Total Capital		<u>3 189</u>	<u>3 385</u>
TOTAL CAPITAL (Equity & Non-Equity)		<u>22 650</u>	<u>19 987</u>

2. MARKET VALUE

Market value of equity on
25 June 1993

= 566,1 million shares x daily average share price for June 1993			
= 566,1 x R18,76		10 622	9 073

Book value of non-equity components of capital		<u>3 189</u>	<u>3 385</u>
Market value		<u>13 811</u>	<u>12 458</u>

**3. MARKET VALUE ADDED
(MVA)**

Market value less Total
Capital (Equity & Non-Equity)

= 13 811 - 22 650		<u>(8 839)</u>	<u>(7 529)</u>
-------------------	--	----------------	----------------

REF	:	CFS = Cash flow statement
	:	B/S = Balance sheet
	:	I/S = Income statement

NOTE 1

**ORDINARY SHAREHOLDERS' INTEREST
(BALANCE SHEET FIGURES)**

	R'MILLION	
	1993	1992
Share Capital	1 375.6	1 369.9
Shareholders reserves	6 987.1	5 994.3
- Distributable reserves	4 987.7	4 171.2
- Tax equalisation reserve	100.0	-
- Provision for factory turnaround	210.0	133.6
- Deferred taxation	1 689.4	1 689.5
Coal mining assets at book value		
(Add Back: MVA calculation)	<u>(1 582.0)</u>	<u>(1 402.8)</u>
Ordinary Shareholders' Interest	<u>6 780.7</u>	<u>5 961.4</u>

NOTE 2

LIFO RESERVE

R'MILLION

	1992/93	1991/2
1. ADJUSTMENT TO ASSET VALUE (MVA)		
LIFO Value		
- Crude oil and other raw materials	137.9	55.7
- Manufactured products	<u>453.4</u>	<u>369.2</u>
	591.3	424.9
FIFO Value	<u>934.1</u>	<u>736.1</u>
Increase in Stock Value	<u>342.8</u>	<u>311.2</u>
2. ADJUSTMENT TO PROFITS (NOTE 4)		
- Adjustment 1991/92		311.2
- Adjustment 1992/93		<u>342.8</u>
Increase in profit 1992/93		<u>31.6</u>

NOTE 3

INFLATION ADJUSTMENT ON FIXED ASSETS

R'MILLION
1992/93

1. PLANT, EQUIPMENT AND VEHICLES

Depreciation for the year (excluding disposals)	<u>521.05</u>
Accumulated depreciation on 25 June 1993	<u>4 255.0</u>
Book value on 25 June 1993	<u>7 058.7</u>

2. AVERAGE AGE OF ASSETS

$$\frac{\text{Accumulated depreciation}}{\text{Depreciation for the year}} = \frac{4\,255.0}{521.5} = \underline{\underline{8.2 \text{ years}}}$$

**3. CURRENT VALUE OF ASSETS/
DEPRECIATION FACTOR**

Production Price Index: Machinery, non-electric trading goods for usage in South Africa

Formula for assets with an age of

$$8.2 \text{ years} = \frac{122.9}{48.7} = \underline{\underline{2.524}}$$

4. CURRENT VALUE OF ASSETS/DEPRECIATION

R'MILLION

	ASSETS	DEPRE- CIATION FOR
	25/6/93	1992/93
Factor	<u>2.524</u>	<u>2.524</u>
Book value	7 059	522
Present value (2,524 x 7 059)	<u>17 817</u>	<u>1 317</u>
Adjustment	<u>10 758</u> (MVA)	<u>795</u> (EVA)
		(Note 4)

NOTE 4
**NET OPERATING INCOME AFTER TAX
(NOPAT)**

	REFER NOTE	R'MILLION
1. ADJUSTED EBIT-CALCULATION		
Net income before taxation	I/S	1 835.9
Plus: Interest paid		439.0
- Loans	I/S	350.3
- Convertible debentures	I/S	88.7
LIFO adjustment	2	<u>31.6</u>
		2 306.5
Less: Depreciation adjustment	3	(794.8)
Plus: Holding Gain	7	<u>608.0</u>
Adjusted EBIT		<u>2 119.7</u>
2. CASH INCOME TAX		
Taxation per income statement		347.9
Tax saving on convertible debenture interest		<u>(35.5)</u>
Net taxation for the year per income statement	6	312.4
Taxation on interest paid		(193.2)
Taxation on extra ordinary items		-
Cash tax		<u>505.6</u>
3. NET OPERATING PROFIT AFTER TAX		
Adjusted EBIT		
Cash tax		2 120
NOPAT (EVA)		<u>506</u>
		<u>1 614</u>

NOTE 5
**WEIGHTED AVERAGE COST OF CAPITAL
(WACC)**

	3 YEAR AVERAGE DEBT TO CAPITAL RATIO	AFTER TAX RETURN	WEIGHTED AVERAGE COST OF CAPITAL (WACC) %
Equity	85.72	19.76 (1)	16.9
Debt	14.28	8.12 (2)	1.2
	100.00		18.1

Notes:
1. Cost of equity %

Risk free rate (Government bonds)		14.00
Estimated risk premium	6%	
Sasol's beta	<u>0.96</u>	<u>5.76</u>
		<u>19.76</u>

2. Cost of debt

Cost of debt is estimated at 50 basis points over the risk free rate

After tax cost of debt = $14.5 \times 0.56 =$ **8.12**
 Tax rate (Note 6)

NOTE 6
TAXATION ON INTEREST PAID (1992/1993)
R'MILLION
1. EFFECTIVE TAX RATE

Net income before taxation	<u>1 836</u>
Taxation @ 40%	734
Taxation on dividends declared (15% of R487)	<u>73</u>
Tax liability	<u>807</u>

$$\text{Effective tax rate} \frac{807}{1\ 836} \times \frac{100}{1} = \underline{44\%}$$

2. INTEREST PAID

Interest paid (per income statement)	
- Loans	350.3
- Convertible debentures	<u>88.7</u>
	<u>439.0</u>

3. TAXATION ON INTEREST PAID (NOTE 4)

Interest paid x effective tax rate	
439 x 44% =	<u>193.2</u>

NOTE 7
HOLDING GAIN

1. AVERAGE INVESTMENT IN OTHER FIXED ASSETS	R' MILLION	
Book value	1993	1992
- Plant equipment & vehicles	7 058.7	5 854.6
- Capital work in progress	<u>816.5</u>	<u>1 096.7</u>
	<u>7 875.2</u>	<u>6 951.3</u>
Average investment	<u>7 413.2</u>	

2. WEIGHTED AVERAGE INFLATION RATE, FOR FIVE YEARS BASED ON THE NON-ELECTRIC MACHINERY PRICE INDEX

YEAR	PRICE INDEX	INFLATION %	WEIGHT	PRODUCT
1993	122.9	6.5	5	32.5
1992	115.4	7.6	4	30.4
1991	107.2	7.0	3	21.0
1990	100.2	11.0	2	22.0
1989	90.3	17.0	1	17.0
1988	77.2	-	-	-
			15	122.9

$$\text{Weighted average inflation rate} = \frac{122.9}{15} = 8.2\%$$

3. HOLDING GAIN (REFER NOTE 4)

$$\text{Average Investment} \times \text{Weighted average inflation rate} = 7\,413 \times 8.2\% = \underline{\underline{\text{R608 million}}}$$

4.5 CRITICISM OF EVA

Although EVA as a measure of corporate performance is the method which the various variables determining shareholder value in this study are derived from, it does have a number of shortcomings, as any such a system would have.

Many of the criticisms targeted against EVA are based on misconceptions about or ignorance of the subject. Other problems with EVA originate from a lack of management support (for whatever reason), whilst still other problems seem to have genuine grounds. The various criticisms or problems people have with EVA will be given simultaneously with explanations and clarification where applicable.

Stewart (1995:81), one of the fathers of EVA, addresses the five main ways in which managers err in applying EVA. Firstly, EVA must be a way of life. One must adopt EVA and not merely calculate it. Secondly, most managers try to implement EVA too rapidly. Depending on the size, complexity or diversity of the organization, it could take from five months up to a year to implement EVA, starting from top management and then gradually pushing it down the ranks. Thirdly, there must be a process of selling EVA, but it should be sold with the idea that it is going to be bought by **everyone** in the organization. All the department heads must work together, driven by the EVA incentive plan (see Chapter 8 of this study) in order to make a success of the EVA system. Fourthly, it must be conveyed to the managers and all other employees that EVA will reward **all stakeholders** of the firm if it is correctly implemented. Lastly, the training of all employees in EVA is important, because even those who do the smallest jobs can help create value.

Another aspect that can create a problem for the management of a company is the fact that the share market is forward-looking. When one announces that one is going to adopt an EVA system, or that one is going to spin off or sell a subsidiary, the company's share price is likely to go up. Internally, though, one has not achieved that value yet. One has to spend the next two years or so achieving that

expected value just in order to keep the share price from falling. The solution to this problem is to use EVA as an **internal** measure of performance and to let MVA be the barometer of the market's expectations.

Another aspect of EVA that needs careful consideration is that of determining the cost of capital, or c , as it has been used in the calculations. This is particularly relevant in decentralized companies with various business units. The weighted average cost of capital (WACC) is not an output of the accounting system. Sub-optimal shareholder value may arise if the WACC is determined incorrectly (Best 1995:38). Calculating WACC is an important step in the EVA calculation, but what is more important is the fact that just charging managers for the use of **total** capital, and making their bonuses depend to a large extent on covering that capital charge, goes a longer way towards motivating efficiency than making subtle distinctions between levels of risk and cost of capital.

If one is going to hold people accountable for their performances on a year-to-year basis, one has a problem if one has large investments in time period zero whilst benefits might accrue only in the second, third, etc. years. Glasser (1996:42), the CEO of a company in the USA (GATX), contends that the EVA approach can penalize companies that utilize assets with long-term returns. Their investments generate a regular revenue stream during their life, and a lump sum when they are sold. The more such companies invest, the lower their EVA. When investments are restricted, EVA improves. Stern (1994:64) attempts to solve this problem by putting large capital expenditure items into a suspense account. Instead of being amortized on a standard depreciation schedule, they bear interest at the required rate of return. The company and its shareholders thereby avoid being penalized for investing large sums.

One must also remember that it is possible to get into a situation where a company can have a negative EVA due to a (continuous) big investment programme, but, if the returns are attractive ($r > c$), the market can realize this and the company may be rewarded accordingly by an increasing MVA. As Stewart (1990:124) strikingly puts it: "Happiness is a negative cash flow - so long as the returns are attractive".

Stewart (1994:79) also addresses the issue of depreciation by stating that it troubles some critics that EVA is measured **after** subtracting depreciation from the income statement and the balance sheet. It seems that the basis for confusion is the notion that depreciation cannot be an economic charge because it is a non-cash charge. Depreciation is, however, an economic charge, because it is a cash equivalent charge, in the sense that one pays for depreciation in cash if one leases the asset instead of owning it. But, taking a steady depreciation charge (straight-line depreciation) against a steady cash flow leaves steady earnings against an asset base that declines with depreciation. The problem is real, however the culprit is not EVA, but it is basing depreciation on an accounting basis instead of on an "economic" basis. One way to address this problem (in addition to the method mentioned in the paragraph above) is to implement a sinking-fund depreciation where little depreciation (and thus more earnings) is recorded early on and, more depreciation (and fewer earnings) towards the end of the project. EVA is therefore recorded over the life of the asset. In practice, however, one finds that the distortion is immaterial as long as a company has a reasonably steady capital spending programme which calls for continuous growth and replacement (Stewart 1994:81).

When a company manufactures a number of products in various divisions, one can allocate costs down to the cent and they will be right mathematically, but they do not tell one anything about the true economic profitability of producing a joint product. Neither EVA nor any other accounting system is set up to handle the kind of problem that arises from synergies. One can measure the EVA of an entire company, but when one tries and divide the EVA, one gets the classic "hamburger and hide" problem of allocating joint costs and benefits. In order to resolve this problem, one has to revert to some subjective judgement of cost or benefit allocations by top management.

Staying with the "accounting problems" of EVA, the question of whether EVA is based upon book values can arise. Stewart (1994:78) advances several interesting explanations for why it is more cost effective to use book values instead of market

values when one is calculating EVA. Firstly, adjusting and updating values to market values on a regular basis sometimes calls for subjectivity, in any case imposes large costs on any accounting system. Secondly, a way to circumvent the problem of historical costs has been found: managers can be rewarded, not for the absolute value of EVA, but for the year-to-year **changes** in EVA. If one rewards managers for improving EVA, it does not really matter what value one initially assign to the assets, because the three principal ways to increase EVA (see Section 4.3.1) have nothing to do with the existing asset base.

For an EVA system to be effective, one has to be willing to decentralize the firm and "empower" the operating managers. Not all the decisions can be made at the top of the organization. The problem that arises is that, in certain industries (stable, mature, low-tech industries facing no competition), decentralization is probably not ideal. The agency costs associated with delegating decisions to line managers in such cases probably outweigh the benefits (Stern 1994:68).

Sheenan (1994:86) does not criticise the EVA system *per se*, but he is doubtful that EVA is the **only** answer. The long-term success and survival of a company depends not only on the shareholders (or their wealth), but also on the benefits received by other stakeholders in the company. These can include customers, employees and suppliers of labour, technology and capital. Long-term shareholder wealth can only prosper when these factors combine in a synergy. EVA is a valuable tool in setting the right goals and objectives, but reaching those goals requires more than an inward look at capital, cash flows, cost of capital and compensation. It is also necessary to be outward-looking, facing customer needs and meeting customer demands more efficiently than the competition can.

In order for EVA to be successful, a company must ensure that its employees are inspired to change and head for superior performance, away from their conventional comfort zone. Sometimes sweeping organizational cultural changes are needed to ensure that the goals set by EVA can be met, and more often than not, one finds that convincing and moving employees to do just that can be one of the major obstacles in the path of the EVA system.

4.7 BENEFITS OF THE EVA SYSTEM

The EVA financial system forms one of the cornerstones of this study, which in itself could be an indication of the sound principles and advantages thereof.

The discussion, explanations and calculations of EVA above, should make EVA's advantages obvious. It is, however, appropriate to conclude this section on EVA with a short summary of EVA's unique advantages over other (economic) models of determining shareholder value.

EVA encourages managers, in fact all employees of a business, to look for profitable growth opportunities, while at the same time economizing on the use of capital. This is particularly relevant (and in fact necessary) in South Africa where businesses have to contend with high interest rates, and capital is a scarce resource.

A problem that arises all over the world is that many companies have become too big and complex to be managed from one central place, and therefore one needs to decentralize decision-making and controls. Empowerment through organizational structures means that one has to align the incentives of the operating managers with those of top management and shareholders. The EVA system can accomplish all of this, provided that commitment can be obtained from all the parties concerned.

EVA puts the emphasis in a company's performance on both profits and returns. Both the quantity and quality dimensions of earnings are taken care of. The right balance between profitability and growth is struck so that there is not just a push for ever-increasing revenues without a corresponding check on what it took (expenses and capital) to generate said revenues.

A strong selling point of EVA as a management tool is that it provides a clear statement of financial objectives which can be communicated to all levels of

management. EVA is also a good way of communicating, not only with shareholders, but also with institutional investors and analysts. It is an alternative accounting framework that should encourage more and better communication between management and shareholders and between shareholders themselves (Stern 1994:60).

Although the implementation of the EVA system can be difficult, it is important to remember that it provides, in essence, a simple measure or yardstick. It is the simplicity of the concept that can make employees in all levels of the company conscious of what they are doing and why they are doing it. If one rewards people on a clear and simple basis, one can impress shareholder wealth creation into their very being. Even if some individuals do not get it right at first, peer pressure alone should move most to behave as value-maximisers (Stern 1994:70).

In management's quest to manage a company in the best interests of the shareholders, one often finds that a number of performance measures are being used which the operating managers must adhere to. EVA is a **single** measure that embodies all the aspects of both the efficient application of company resources as and shareholder wealth creation. With EVA as the basis for capital budgeting calculations, performance evaluations and bonus determinations, managers tend to spend money as carefully as though it is their own, with accompanying benefits for the company and its shareholders (Stewart 1994:74). It comes as no surprise when, after EVA has been implemented as an operating measure, an "original" capital expenditure program is trimmed down, and, in some cases, a substantial reduction takes place. The reason for this is probably that on some extra or incremental funds, the cost of capital cannot be earned thereby adversely affecting not only company or division performance, but also the managers' bonuses. Remember that on performance measures such as return on investment, return on assets or earnings, investment projects can look attractive whilst they actually destroy wealth.

Managers of a company can have different goals from that of the shareholders of the firm. This conflict of interests is described as the **agency theory** (Jensen & Meckling 1976:305). A number of managerial incentives have been developed over the years in order to bridge this gap between the goals of managers and shareholders. These incentives include cash bonuses, performance shares and employee share option plans. It falls beyond the scope of this study to debate the merits of the different incentive schemes or even other possible solutions. However, it is relevant to this study that EVA provides shareholders with a solution to the agency problem. Whilst it is widely recognised that some form of incentive or reward (of whatever nature) is necessary to persuade managers to act in the best interests of shareholders, it is the **performance measures** utilised to determine the rewards of the managers that are under scrutiny. In the past, measures such as earnings per share, return on equity, sales or even years of service with the company were used. EVA provides a perfect solution to this problem, and, in fact, an increasing number of companies are implementing an **employee reward system** based on EVA, together with the EVA system itself. Managers are now rewarded if they increase shareholder wealth as measured by EVA.

Sheehan (1994:86) elaborates on the above ideas and states that actions such as those as described in the paragraph above attempt to reduce the agency problem by motivating managers to feel like business owners. Some economic rationality is found in some successful private companies that was not always present in public companies. Owners of private companies do not invest in projects with a negative return, nor do they manage their companies for accounting profits. Often one sees public companies undertake initiatives designed to increase short-term accounting earnings while reducing cash or economic returns.

Likewise, one seldom hears the owner of a private company saying that equity funding is "cheap", let alone ignoring a return thereon when tallying up the past year's financial performance. Equity capital is extremely valuable to a private owner. Managers who have little or no shareholding in the company and are compensated on a cash basis often do not see the sense of these arguments,

which demonstrates the existence of the agency problem in a slightly different form. A reward system based on EVA can change all of this.

Another sector where EVA can be applied with success is in the state or semi-state institutions. Stern (1994:70) describes the implementation of EVA at a government agency in South Africa a number of years ago. Four months were spent implementing the programme and conveying its contents, meaning, principles and goals to the more than 11 000 employees, 85% of whom did not have a matric. The programme was such a success that the EVA for the first six months exceeded five times the forecast for the entire year. There are however, a number of conditions which must be met and unique problems which must be overcome when one targets the semi-state sector. Firstly, there must be a measurable capital base as well as income or turnover (expenses are usually no problem). Secondly, determining the cost of capital, and more specifically the cost of equity, could be a thorny issue, although with certain assumptions these problems can be overcome. The moral of the story, however, remains that, in many cases, all one has to do to improve people's performance is to get them to understand how superior performance can help themselves.

To illustrate the above point, one can consider the fact that EVA is to be implemented at the United States Postal Service (Spinner 1995:93). The U.S. Postal Service had losses in 18 of the last 25 years. If the EVA programme is successful, the Postal Service could generate up to \$1 billion toward the end of the century. It is a capital-starved, labour-intensive, highly regulated government institution. Furthermore, faxes, e-mail and the advent of electronic banking threaten to make inroads into the traditional fields of services provided by the Postal Services. From a financial perspective, the Postal Service operates under constraints that would frustrate most private-sector financial executives. It does not have access to a bank line of credit; it must borrow at a rate most large corporations would not consider favourable. The Postal Service is also tied down by Senate and by public opinion. The reader can probably draw the parallels and see the similarities between the U.S. Postal Service and the South African post

office. Everything fits, especially the huge losses reported lately. Is it possible to implement EVA in such a scenario? Moreover, what are the chances of bringing about a positive change? Let us briefly consider this real test for EVA's capabilities.

In order to implement the EVA programme in an institution with characteristics such as those of the postal services, one needs to develop a method to calculate the contributions by various local offices or clusters of offices accurately and to reward employees for improvements. To measure whether a given cluster is adding value or not, a new method of allocating revenues must be developed. Revenues are usually allocated independently of the labour required to produce them. For example, the postage revenue from bulk-mail catalogues or accounts are received by one post office while other offices must do the actual processing, distribution and delivery.

To solve such problems and make it possible to generate meaningful EVA figures, the U.S. Postal Service developed a system of transfer pricing based on statistical analysis of samples of mail from various locations. These statistics can be accurate down to the cluster level. By allocating costs and revenues according to work load, employees' energies can be directed in more productively.

Whilst it can be difficult to calculate and allocate revenues as described above, an even more difficult issue can be that of determining the cost of capital, and more particularly the cost of equity. In the case of the U.S. Postal Service, it was decided to charge each performance cluster for capital, plant, machines, trucks, offices etc. at 12% (Spinner 1995:95). It was calculated that after deducting a cost of capital of 12%, break-even occurs, which in itself is a monumental achievement. Stewart himself said in one of Stern's articles (Stern 1994: 64) that when people ask him these days what the cost of capital is, he often tells them that it is 12%, because that is 1% per month. From this statement it should be clear where, one year later, the U.S. Postal Service derived their 12% cost of capital from. Recall also that in Section 3.6.5 above it was stated that just

charging managers for the use of capital motivates them and improves their efficiency. In the case of the postal services, the aim is to keep costs down and to provide quality service to the customers.

Furthermore, the head of the U.S. Postal Service recognises that EVA brings together all aspects of one business into one measure. It changes the focus from the traditional government culture. Revenues can be increased **only when** it is profitable, investment can take place **only when** it produces a return in excess of the cost of capital and costs can be reduced **only when** it does not impede on service to customers.

From the above, it can be seen that EVA's application and advantages can be stretched beyond the traditional (listed) companies. Semi-government institutions, and in South Africa's case, the postal services, can also reap the benefits of the EVA system or at least from applying its principles.

To conclude this section, one can say that EVA and its underlying "building blocks" are a dependable statement of performance, because the measure is free from the limitations of the nature and rules of accounting data. Comparability is made possible between divisions and between organisations. One can even go further and say that EVA provides global uniformity relating to the valuation and interpretation of shareholder wealth (Best 1995:38).

4.8 CONCLUSION

The last section of this chapter gives a brief "different" overview of Chapters 2, 3 and 4 in order to set the scene for the following chapter. Apart from illustrating how the evolution of (financial) management causes the need to arise for a different way of measuring shareholder value, attention is also given to a concept that has not been previously discussed, but which has played (and sometimes still does play) an important role in this whole process, namely the leveraged buy-out (LBO) that was so popular a number of years ago.

In the end, EVA proves to be not only the answer to many problems, but also overcomes many obstacles. It can also be used to analyse the variables or pillars on which it is built.

4.8.1 Evolution

With the ever-increasing change in technology and the information associated with that change, together with the rise of a global economy, brought about considerable changes in the structure and control systems of large companies. Centrally-directed economies are failing and state-owned enterprises all over the world are increasingly being privatised.

This change is also accompanied by a flattening of management hierarchies, with the responsibility for corporate decision-making being driven down the ranks to managers and employees closer to the company's operations and customers (Stern, Stewart & Chew 1995:32).

One of the questions or problems that now arises is that of correct decision-making and distinguishing between not only profitable or unprofitable capital investment projects, but any decision that may affect the wealth of shareholders. Is there an (accounting) system that can provide the correct answer **at the time** when the decision has to be made?

The answer lies, of course, not with a computer or accounting system of some sort, but with the experienced managers and employees working at the very centre of the company's operations.

The centralized top-down approach to managing large companies was well suited to the relatively stable business environment of the 1950s, 1960s and 1970s. Top management's challenge was to achieve economies of scale in manufacturing and marketing, mainly by identifying growth opportunities in similar industries. A budgeted profit per division provided for budgeted increases in profits and earnings

per share. As long as operating heads "negotiated" easy targets or estimates, "excess" profits could be banked for a rainy day by shifting revenues or costs. Buying companies with lower price/earnings ratios in share exchanges boosted reported EPS, but with no economic substance whatsoever.

These processes made easier life for the divisional heads and helped top management to produce smoothly rising EPS to satisfy shareholders. Thus, while divisional heads were "sandbagging" their estimates for head office, top management were, in a sense, sandbagging shareholders who seldom knew the true economic value or performance of their capital investment.

Donaldson (1994:55) argues that top management did not see their primary goal as maximising shareholder value, but rather as achieving a proper balance between the interests of the shareholders and the other stakeholders (such as employees, suppliers and local communities). Reporting steady increases in EPS was equivalent to giving shareholders their due.

During the early 1980s, however, the deficiencies of the top-down EPS-based system began to show in several ways. Conglomerates saw their share prices under-performing market averages, even as they were producing steady increases in EPS. As it became clear that large centralized conglomerates were worth far less than the sum of their parts, corporate raiders launched a "deconglomeration" movement (Stern, Stewart & Chew 1995:34).

One of the main reasons why the EPS-based control system failed, was its refusal to empower employees lower down in the company hierarchy and to let them feel that they are custodians of investor capital. This lack of ownership meant, *inter alia*, that business units were evaluated on the absolute amount of profit that they generated, irrespective of the amount of capital that it took to do so. Operating managers could achieve growth in profits by either improving the efficiency of existing operations or by investing more capital. Because most corporate measurement systems did not hold managers accountable for new capital, it did not

take managers long to recognize that it was easier to "buy" additional operating profits with additional capital investment.

This highly inefficient and uneconomical way of operating did not pass unnoticed. On the horizon, there appeared a new breed of business people who, with sound economic and business principles and with entrepreneurial flair, can take advantage of the situation.

4.8.2 The rise and fall of the leveraged buy-outs

As noted above, the widespread misallocation of corporate resources and waste of capital under the EPS-based system attracted the attention of corporate raiders during the 1980s (Jensen 1991:13). They used a performance measure that was quite different to EPS, namely a company's ability to generate operating cash flow (as opposed to earnings) as well as efficiency in the use of capital.

Bhide (1989:36) did research on "friendly" and hostile takeovers during the late 1980s. Whereas the friendly deals were mostly undertaken to take advantage of vaguely defined "synergies", the vast majority of hostile deals were motivated by profits resulting from cutting overheads, improving focus by selling unrelated business units and ending unprofitable reinvestment of profits and capital. Hostile targets were mainly low-growth, poorly performing and often highly diversified companies in which management had a negligible equity stake.

Leveraged buy-outs (LBO) were one of the success stories of the 1980s. One of the reasons for this is the characteristics of the takeover target: the lack of ownership by the managers. The head-office management of corporate conglomerates (which sometimes numbered thousands) were replaced by a small team of professionals. They were said to provide the same co-ordination and monitoring functions as their predecessors. However, the difference lay in the fact that, amongst other things, compensation and ownership plans substituted the direct monitoring and centralized decision-making of typical corporate bureaucracy.

The LBO provided greater decision-making autonomy and ownership incentives whilst at the same time accommodating more demanding performance targets.

Other differences between LBO firms and most public companies during the 1980s are also worthwhile mentioning, as some of these provide a direct link between what went wrong in these companies and the journey towards the EVA model of management and valuation.

Firstly, the new LBO company did not want (nor need) to report increased earnings. Instead, owner-managers concentrated on accounting methods to minimize reported earnings in order to pay as little tax as possible. They therefore effectively increased the after-tax cash flow.

What was more important, however, was the way investor capital was treated. Operating managers in many large companies treated investor capital as "free" goods. In the typical LBO company, with a debt ratio of 90% on average, a key concern was to produce sufficient cash flow to meet high interest payments. Failure to do so would result in a loss of the equity investment of the new operating managers. The cost of capital became highly visible and contractually binding. What was further significant was the fact that the traditionally forgotten (or "free", at least in the income statement) portion of the cost of capital, namely equity, weighed in with such a big portion now.

In a firm that is mainly equity-financed, management could (and more often than not did) allow much of the equity cushion to be eroded before taking the necessary corrective action. In a firm heavily burdened with debt, internal control mechanisms became very visible and effective, acting swiftly and decisively to restore the necessary order.

In the LBO company, managers provided (or were required to purchase) a significant equity stake. This ownership was designed to encourage managers to resist the temptation to take short-term decisions to increase profits at the expense

of long-term benefits. If managers are shareholders in the company, one can be confident that they will constantly attempt to balance short-term and long-term goals in creating value. The greater the level of productive investment undertaken by managers, the higher the value of their shares (Stern, Stewart & Chew 1995: 37). The concentration of ownership and improvements in the pay-for-performance systems was probably one of the main reasons why researchers find large improvements in the operating activities of companies that were subject to an LBO.

The directors of a typical LBO company did not represent the shareholders, they **were** the shareholders. They became the owners and therefore it was second nature to them to unlock the true value and potential of the company.

But, as the 1980s came to an end, it emerged that some of the deals concluded during the latter part of the decade were flawed. Jensen (1991: 25) was not only the first to see the value adding potential of LBOs, but he was also the first to identify the source of the problems that arose in the later transactions. It appears that the problem originated from the fact that there were no great parallels between the goals and incentives of the dealmakers who promoted the transactions and the lenders and other investors who provided the necessary funds. This led to a concentration of overpriced and poorly structured deals which were entered into without the right incentives or objectives. In addition, it was these very transactions where the famous "junk bonds" made their appearance. As a result, management and other interested parties, notably the dealmakers, put in less equity (and presumably less risk, effort and heart).

LBOs thus underwent a sharp decline in popularity and use during the 1990s. According to Stern, Stewart and Chew (1995:39) there were, moreover, a number of inherent limitations in the LBO that, at best, reserve for them a specialized role in corporate finance. First, there is their reliance on high leverage. This limits their use to industries (or companies) where one finds tangible assets, modest capital requirements and highly stable cash flows. The second limitation of LBOs stems from one of their biggest benefits: equity ownership. Concentration of ownership

also means a concentration of risk-bearing. Listed companies are efficient in spreading ownership and hence risk among the different investors. The costs associated with the rewards required by the owners of this risk at some point outweigh the benefits of concentrated ownership.

4.8.3 The best method

The accomplishments of the LBO movement hold some important lessons for the structure and governance of public companies. Top management must design a performance measurement and reward system that stimulates the feel and payoff of ownership. This is the principal aim and accomplishment of an EVA financial management system.

An EVA-based system "rewrites" the traditional accounting income statement and balance sheet. Operating profit is converted to economic profit, total capital is measured and, most importantly, the **total** cost of capital is made explicit **and accounted for** in the calculation of shareholder wealth.

EVA is an internal measurement that management can implement throughout the company. It allows key management decisions to be clearly modelled, monitored, communicated and rewarded, according to how much value they add to shareholder investment. Whatever the action or decision (capital budgeting, valuing an acquisition, assessing performance, or determining bonuses), the objective of increasing EVA over time offers a clear financial mission for management: one that truly supports the goal of the firm by focusing soundly on an increase in shareholder wealth.

When an EVA system is properly implemented and utilized, it is a closed-loop system of decision-making, accountability and incentives - one that holds the entire organization, not just the CEO, responsible for the successes and failures of their actions.

It is all these attributes of the EVA system that arguably makes it the best performance measure of corporate performance. Furthermore, its composition and calculation abilities allows an analysis of the various variables or pillars on which it is built. The identification, categorizing and analysing of these variables form the subjects of Chapter 5, before the study moves to its primary objective of this study, namely the quantification of those variables that determine shareholder value.