# Correlating internal and external performance yardsticks in the evaluation of corporate wealth creation

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## Abstract

It is widely accepted that the primary objective or goal of a firm is to maximise the value of its shareholders' equity. In management's attempts to increase shareholder value as measured by the market value of a company, they continuously influence, directly or indirectly, those variables that affect shareholder wealth. The goal of this study is to determine which internal performance measurement of a company correlate the best with its external performance measurement as represented by the market value (shareholder value creation) of the corporation.

In the literature part of this study, the emphasis fell not only on drawing a distinction between accounting-based and economic-based methods of determining shareholder value, but also on the fact that Economic value added (EVA) in particular, have distinct advantages in determining value created (or destroyed) by the management of a company. However, other internal ratios or yardsticks which might have an influence on the market value of a company are also identified and placed alongside EVA as variables that can correlate with the shareholder value created by the company. Whilst EVA and other variables or ratios are **internal** measures of shareholder value creation, Market Value Added (MVA) is the **external** method of determining shareholder's wealth. In order to achieve the goal of this study, an empirical analysis was conducted.

The results of the empirical analyses were reported and compared with the theoretical principles. It was found that accounting-based performance yardsticks does not correlate as good with the market value of a company as economic-based methods such as EVA.

> **Key Words**
>
> *Corporate performance measurements*
> *Market value added*
> *Economic value added*

# 1 Introduction

In answer to the question of what drives, determines or sets shareholder wealth, there are two competing answers. Variables used as internal company performance yardsticks can be calculated using either **accounting-based** principals, or **economic-based** methods.

The goal of this study is to investigate which corporate performance yardstick correlates the best with shareholder value creation.

The shortcomings of the accounting-based yardsticks are briefly discussed, after which the advantages of the economic-based methods, and in particular Economic value added (EVA) is highlighted.

These internal performance measures, whether accounting-based or economic-based, must be compared with some external performance measurement of a company. It is contended that whilst EVA is arguably the best internal performance measurement, Market value added (MVA) is the share market's (external) assessment of the value that management has created (or destroyed) for shareholders.

A sample of companies together with relevant internal performance variables are presented in Section 4.1 of this study. A correlation between these internal performance measurements and MVA as external performance measurement will be sought in order to achieve the goal of this study. The results are discussed, interpreted and compared with the theoretical principals, where-after certain recommendations can be made.

# 2 Accounting-based models

## 2.1 Overview of the principles involved in accounting-based models

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 as part of the P/E ratio method a very unreliable measure of value (Stewart 1990:22).

The market is not fooled by cosmetic earnings increases which can be achieved by accounting entries; only long-term earnings increases, that correspond with improved long-term cash flow, increase share prices. There is substantial evidence supporting the view that the market uses a sophisticated approach to assess accounting earnings. Copeland, Koller and Murrin (1990:79) classify this evidence into three classes: a) evidence that accounting earnings are not well correlated with share prices; b) evidence that earnings window dressing does not improve share prices; and c) evidence that the market evaluates management decisions based on their expected long-term cash flow impact, not on their short-term earnings impact.

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.

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.

## 2.2    Concluding remarks

Earnings, earnings per share and earnings growth are argueably not the best 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 research and development are charged against earnings instead of taking the real earning power over the expected life span into consideration.

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 Economic models

## 3.1 Introduction

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**.

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 Stern Stewart, published a book, *The quest for value*, in which his method of determining shareholder value was named "Economic Value Added (EVA)".

EVA is a measure of corporate performance developed, refined and popularised by Stern and Stewart 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 maximise the firm's value for its owners.

In more recent times, a number of writers explored the principle that in order to account for all the cost of funds supplied to the firm, one must deduct the total cost of capital from income earned. Solomons (1965: 63) named "the excess of net earnings over the cost of capital", residual income, a true measure of managerial success.

An author which recognize that the pure accounting-based methods of determining shareholder value were not adequate, was Fruhan. 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.

Another author that proposed an economic-based method was Rappaport (1986). His articles during the early 1980s 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".

Nobel laureate Merton Miller refocused the goal of maximising shareholder value creation towards maximising "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.

It falls beyond the scope of this study to discuss all these models in detail as they all calculate in essence shareholder value that was created. In this study we will concentrate on EVA as economic-based model due to the fact that a reliable data base of our sample (as set out in Section 4.1) exists.

## 3.2    Eva defined

### 3.2.1  The theoretical model

As can be deducted 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 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 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) 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):

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

$$r = \frac{\text{Net operating profit after tax (NOPAT)}}{\text{capital}}$$

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

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

$$
\begin{aligned}
\text{EVA} &= (r - c) \times \text{capital} \\
&= (0.25 - 0.15) \times 2\ 000 \\
&= \text{R200}
\end{aligned}
$$

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.

## 3.3      Market value added

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's 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.

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:

Market value added = market value - 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 maximising shareholder value, which is the goal of the firm.

**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 an MVA as two valuation concepts. It is this link that forms the subject of the discussion in the next section.

### 3.4  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

capitalised 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 R0 and sell at a market value equal to capital, and therefore have an MVA of 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).

$$MVA = \text{market value - capital}$$
$$MVA = \text{present value of all future EVAs}$$

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.

## 3.5 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 maximise a company's EVA, MVA automatically follows, as does the improvement in shareholder value. Maximising MVA should be the primary objective for the management of a company that is concerned about its shareholders' wealth (Stewart 1990:153).

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.

With these theoretical principles established, the empirical investigation can be undertaken in order to reach the goal of this study: Determining which internal performance measurement correlate best with the external performance measurement (as represented by MVA).

# 4  Research methodology

So far, the theoretical principles under discussion in this study have been dealt with. As a forerunner to the empirical analysis, it is also necessary to develop a blueprint for the collection, measurement and analysis of the data.

## 4.1  Data collection method

The data base of the Bureau of Financial Analysis (BFA) at the University of Pretoria was used to obtain information about the various companies used in the sample.

In order for an analysis to be performed on the sample of companies selected, those companies that meet specified criteria first had to be identified.

Economic value added, as the first criterion can best be calculated by using financial information from industrial companies. The financial statements of mining, financial and investment companies do not provide the type of financial information required. They pose a number of problems, which means that an EVA calculation can only be done after considerable adjustments (and sometimes problematic and sweeping assumptions) have been made. For the purpose of this study, it was therefore decided to use industrial companies only. When the sample was compiled and the statistical analysis was done (during the last half of 1997) there were 342 industrial companies listed on the Johannesburg Stock Exchange.

The second criterion was the number of years for which EVA could be calculated for each company. It was decided that a period of ten years

would provide sufficient information. In order to calculate the EVA of a company for ten years, one needs financial information on the company for eleven years, because beginning capital ("ending" capital of the previous year) is used in the calculation. This criterion eliminated 173 companies from the original sample of 342, so that 169 were left.

The last criterion required the elimination of thinly traded shares. This criterion was applied because one of the variables that is calculated by the EVA-program at the BFA is the beta of a company's share, which in turn is used to calculate the cost of equity of that company. The 169 companies remaining in the sample were ranked in descending order of average number of shares traded per year for 11 years. It was decided to set the cut-off point at an average of 500 000 shares traded per year for 11 years. This eliminated another 34 companies, so that a final sample of 135 companies was left.

## 4.2 Internal performance measurements and statistical techniques

After the sample of companies had been selected, it was necessary to calculate the relevant variables that can be used as internal measures of performance of a company's operations. A correlation between these variables as internal performance yardsticks and **MVA** as external or market related indicator will be sought.

The variables as input into the statistical programs were organised as follows:

**Variables that can correlate with MVA**

*Dependent variable*     MVA

*Independent variables*

|     |     |
| --- | --- |
| (1) | Economic value added (EVA) |
| (2) | Discounted EVA |
| (3) | Return on assets (ROA) |
| (4) | Return on equity (ROE) |
| (5) | Return on capital employed (ROCE) |
| (6) | Earnings per share (EPS) |
| (7) | Dividend per share (DPS) |
| (8) | Total debt ratio |
| (9) | Total asset turnover |

| | |
|---|---|
| (10) | Current ratio |
| (11) | Net operating profit before tax/Capital employed |
| (12) | Net operating profit before tax/Sales |
| (13) | Net operating profit after tax/Sales (Margin) |
| (14) | Earnings before interest and tax/Sales |
| (15) | Sales growth |
| (16) | Retained profit/Capital employed |
| (17) | Sales/Capital employed |
| (18) | Sales/Net working capital |
| (19) | Sales/Average total fixed assets |
| (20) | Weighted average cost of capital (WACC) |
| (21) | Total owners' interest/Capital employed |
| (22) | Total long-term loan capital/Capital employed |
| (23) | (Short term-borrowings + bank overdraft)/ Capital employed |
| (24) | Investment rate : Change in Capital employed/ Net operating profit after tax |
| (25) | Company cash tax rate |

It is important to bear in mind that the above variables were calculated for each of the 10 years as well as for the total 10 year period under review, both with and without inflation adjustments to the relevant data.

# 5 Empirical research results

## 5.1 Introduction

The **correlation analyses** consisted of **two** different runs. Firstly, MVA was correlated with the various variables without any inflation adjustments to the data. The second run made provision for inflation adjustments to all the amounts. The results of these two correlation analyses indicated an important trend, namely that the data **with inflation** adjustments provided significantly better results than those **without inflation** adjustments. Taking this finding into consideration, only the results **with inflation adjustments** will be discussed in detail.

## 5.2 Correlation between internal performance measurements and mva with inflation adjustments to data

A summary of the results of this correlation analysis is contained in **Table 1** (overleaf).

The correlation of MVA with EVA was positive. The correlation coefficient for the total 10 year period was 0.16, and significant at the 1% level. The highest correlation coefficient was 0.44 (1991) and also significant, whilst the only negative correlation was found during 1987 (-0.42). Only during 1994 and 1995 was there not a significant correlation appearance. MVA already, to a large extent, discounts or provides for inflation in the share price, which reflects nominal values. EVA at this stage was also adjusted for inflation, hence the positive correlation.

The same arguments as in the above paragraph can be advanced in explanation of the even bigger positive correlation coefficients between MVA and discounted EVA. All the correlations obtained were significant. Barring 1987, in four of the five years (1992 to 1988) the correlation coefficients were between 0.36 and 0.43. This finding supported the theory which claims that MVA is equal to the discounted value of all future EVA.

Both return on assets (ROA) and return on equity (ROE) were positively correlated with MVA. ROA had a higher positive correlation coefficient with MVA, with values ranging from 0.11 to 0.33. However, only the correlation coefficients for the total 10 year period (0.11), 1993 (0.33) and 1992 (0.32) were significant. The inflation adjustments to ROA might have had a bigger influence on the calculated correlation coefficients than those to ROE. It seemed that once these ratios were adjusted for inflation, they correlated more positively with MVA.

**TABLE 1**  **CORRELATION OF <u>MVA</u> WITH THE FOLLOWING VARIABLES (<u>WITH</u> INFLATION ADJUSTMENTS TO DATA)**

| | | | | | | PERIOD | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Total 10 year period | 96 | 95 | 94 | 93 | 92 | 91 | 90 | 89 | 88 | 87 |
| EVA | 0.15585* | 0.29654* | 0.21684 | 0.11192 | 0.37525* | 0.38004* | 0.44281* | 0.34668* | 0.25106* | 0.38119* | -0.41553* |
| SIGNIF | 0.0001 | 0.0005 | 0.0122 | 0.1997 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0037 | 0.0001 | 0.0001 |
| DISCOUNTED EVA | | | | | | 0.26004* | 0.40074* | 0.36167* | 0.39080* | 0.42593* | -0.34978* |
| SIGNIF | | | | | | 0.0024 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 |
| ROA | 0.10647* | 0.20075 | 0.19921 | 0.17570 | 0.32929* | 0.32461* | 0.18572 | 0.16521 | 0.11407 | 0.10455 | -0.00260 |
| SIGNIF | 0.0001 | 0.0200 | 0.0210 | 0.0423 | 0.0001 | 0.0001 | 0.0323 | 0.0574 | 0.1911 | 0.2310 | 0.9763 |
| ROE | 0.06005 | 0.12609 | 0.01346 | 0.12993 | 0.13796 | 0.22940* | 0.12934 | 0.04612 | 0.10068 | 0.08025 | -0.01518 |
| SIGNIF | 0.0294 | 0.1497 | 0.8782 | 0.1391 | 0.1175 | 0.0087 | 0.1409 | 0.5995 | 0.2507 | 0.3585 | 0.8624 |
| ROCE | 0.01711 | 0.09644 | 0.08409 | 0.05515 | 0.09626 | 0.06998 | 0.09350 | 0.02603 | 0.02462 | 0.04860 | -0.09960 |
| SIGNIF | 0.5352 | 0.2732 | 0.3396 | 0.5300 | 0.2760 | 0.4253 | 0.2863 | 0.7670 | 0.7793 | 0.5800 | 0.2559 |
| EPS | 0.09763* | 0.19956 | 0.13890 | 0.35998* | 0.24840* | 0.28528* | 0.08499 | 0.08820 | 0.23193* | 0.12011 | 0.01500 |
| SIGNIF | 0.0004 | 0.0208 | 0.1093 | 0.0001 | 0.0039 | 0.0009 | 0.3307 | 0.3127 | 0.0072 | 0.1685 | 0.8639 |
| DPS | 0.16888* | 0.17871 | 0.25586* | 0.29222* | 0.31297* | 0.31235* | 0.21772 | 0.21289 | 0.28573* | 0.24013* | 0.07840 |
| SIGNIF | 0.0001 | 0.388 | 0.0028 | 0.0006 | 0.0002 | 0.0003 | 0.0118 | 0.0139 | 0.0009 | 0.0054 | 0.3697 |
| TOT DEBT RAT | 0.05530 | 0.00413 | -0.00666 | 0.10762 | 0.15861 | 0.06255 | 0.12528 | 0.26054* | 0.26073* | 0.18616 | -0.10907 |
| SIGNIF | 0.0435 | 0.9622 | 0.9391 | 0.2158 | 0.0682 | 0.4745 | 0.1508 | 0.0025 | 0.0024 | 0.0319 | 0.2114 |
| TOT ASSET T/O | 0.05064 | -0.02341 | 0.00042 | -0.07561 | 0.13149 | 0.14289 | 0.15678 | 0.14756 | 0.14447 | 0.16084 | 0.18765 |
| SIGNIF | 0.0850 | 0.7980 | 0.9964 | 0.4098 | 0.1506 | 0.1276 | 0.0972 | 0.1222 | 0.1286 | 0.0917 | 0.0486 |

\* Indicates significance at the 0,01 (1%) level

TABLE 1 CONTINUED

|  | | PERIOD | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
|  | Total 10 year period | 96 | 95 | 94 | 93 | 92 | 91 | 90 | 89 | 88 | 87 |
| CURRENT RATIO | -0.01291 | -0.03904 | -0.05504 | -0.12459 | -0.09689 | -0.13791 | -0.14058 | -0.09315 | -0.01839 | -0.04544 | 0.13746 |
| SIGNIF | 0.6377 | 0.6543 | 0.5276 | 0.1515 | 0.2672 | 0.1134 | 0.1065 | 0.2862 | 0.8336 | 0.6035 | 0.1160 |
| NOPBT/CE | 0.03429 | 0.18806 | 0.14919 | 0.07574 | 0.14544 | 0.08190 | 0.09695 | 0.03843 | 0.02457 | 0.06860 | -0.07401 |
| SIGNIF | 0.2285 | 0.0372 | 0.0982 | 0.4051 | 0.1056 | 0.3678 | 0.2841 | 0.6730 | 0.7856 | 0.4435 | 0.4258 |
| NOPBT/SALES | -0.01040 | 0.17599 | 0.14780 | 0.22360 | 0.05223 | 0.04620 | -0.09740 | -0.16124 | -0.15661 | -0.14692 | -0.19511 |
| SIGNIF | 0.7283 | 0.0577 | 0.1102 | 0.0149 | 0.5727 | 0.6334 | 0.3092 | 0.0971 | 0.1039 | 0.1292 | 0.0494 |
| NOPAT/SALES = MARGIN | -0.03412 | 0.13638 | 0.06092 | 0.21835 | -0.01451 | 0.09637 | -0.13659 | -0.20499 | -0.17750 | -0.21122 | -0.25924* |
| SIGNIF | 0.2450 | 0.1358 | 0.5068 | 0.0166 | 0.8744 | 0.2950 | 0.1473 | 0.0309 | 0.0612 | 0.0261 | 0.0058 |
| EBIT/SALES | 0.09183* | 0.16841 | 0.17073 | 0.21899 | 0.30957* | 0.28829* | 0.11444 | 0.02523 | -0.02591 | -0.01342 | 0.04852 |
| SIGNIF | 0.0018 | 0.0637 | 0.0612 | 0.0158 | 0.0005 | 0.0018 | 0.2275 | 0.7926 | 0.7863 | 0.8888 | 0.6130 |
| SALES GROWTH | -0.01222 | -0.00926 | -0.03828 | -0.00727 | 0.01892 | 0.12015 | 0.03979 | 0.02798 | 0.00822 | 0.01955 | -0.00993 |
| SIGNIF | 0.6777 | 0.9194 | 0.6768 | 0.9369 | 0.8368 | 0.2009 | 0.6756 | 0.7706 | 0.9314 | 0.8386 | 0.9176 |
| RET.PROFIT/CE | 0.05824 | 0.05347 | 0.10163 | 0.09068 | 0.18245 | 0.27158* | 0.06216 | 0.05321 | 0.04905 | 0.04462 | 0.02927 |
| SIGNIF | 0.0335 | 0.5395 | 0.2426 | 0.2974 | 0.0356 | 0.0016 | 0.4772 | 0.5430 | 0.5750 | 0.6100 | 0.7380 |
| SALES/CE | 0.02455 | -0.02681 | -0.03050 | -0.07202 | 0.06683 | 0.05870 | 0.05046 | 0.07459 | 0.08827 | 0.11306 | 0.14770 |
| SIGNIF | 0.4039 | 0.7694 | 0.7398 | 0.4324 | 0.4664 | 0.5332 | 0.5956 | 0.4365 | 0.3547 | 0.2374 | 0.1219 |

* Indicates significance at the 0,01 (1%) level

**TABLE 1 CONTINUED**

| | Total 10 year period | 96 | 95 | 94 | 93 | 92 | 91 | 90 | 89 | 88 | 87 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | PERIOD | | | | | |
| SALES/NWC | 0.02945 | 0.05572 | 0.06355 | 0.15617 | 0.15715 | 0.11797 | 0.10072 | 0.03025 | -0.00139 | 0.01335 | 0.00058 |
| SIGNIF | 0.3419 | 0.5631 | 0.5155 | 0.1017 | 0.1027 | 0.2353 | 0.3138 | 0.7616 | 0.9890 | 0.8957 | 0.9955 |
| SALES/F.ASSET | -0.00559 | -0.02024 | -0.06703 | -0.05408 | 0.10444 | 0.03091 | 0.01896 | 0.00116 | 0.07647 | 0.09535 | 0.10456 |
| SIGNIF | 0.8493 | 0.8249 | 0.4651 | 0.5558 | 0.2543 | 0.7430 | 0.8420 | 0.9904 | 0.4250 | 0.3195 | 0.2748 |
| WACC | -0.00812 | 0.08431 | 0.12917 | 0.05020 | -0.02426 | 0.02585 | -0.04483 | -0.15950 | -0.17816 | -0.18747 | 0.09829 |
| SIGNIF | 0.7680 | 0.3346 | 0.1384 | 0.5661 | 0.7825 | 0.7686 | 0.6097 | 0.0677 | 0.0410 | 0.0314 | 0.2622 |
| TOT OWN INT/CE | 0.08554* | 0.00373 | 0.03449 | -0.01768 | 0.04226 | 0.09621 | 0.04324 | -0.01985 | -0.05061 | 0.03984 | 0.24624* |
| SIGNIF | 0.0018 | 0.9659 | 0.6924 | 0.8393 | 0.6291 | 0.2706 | 0.6212 | 0.8206 | 0.5629 | 0.6489 | 0.0043 |
| TOT LT LOAN/CE | 0.02606 | -0.00690 | 0.00932 | 0.02149 | 0.04653 | 0.02556 | 0.10489 | 0.14800 | 0.14017 | 0.13469 | -0.09588 |
| SIGNIF | 0.3418 | 0.9369 | 0.9149 | 0.8053 | 0.5949 | 0.7703 | 0.2296 | 0.0891 | 0.1076 | 0.1222 | 0.2723 |
| ST LOAN/CE | 0.01038 | 0.00475 | -0.04007 | 0.11516 | 0.05531 | 0.01984 | 0.03611 | 0.10783 | 0.15148 | 0.11059 | -0.08750 |
| SIGNIF | 0.7048 | 0.9566 | 0.6457 | 0.1852 | 0.5271 | 0.8207 | 0.6799 | 0.2167 | 0.0818 | 0.2051 | 0.3166 |
| INVEST RATE | | | | | | | | | | | |
| CE/NOPAT | 0.01248 | 0.01533 | 0.01767 | 0.01725 | 0.01972 | 0.06600 | -0.02559 | 0.01084 | 0.01109 | 0.06172 | 0.02435 |
| SIGNIF | 0.6561 | 0.0847 | 0.8425 | 0.8468 | 0.8265 | 0.4556 | 0.7778 | 0.9026 | 0.9007 | 0.4872 | 0.7884 |
| TAX RATE | 0.04270 | 0.23081 | 0.24561* | 0.21558 | 0.26618* | 0.17978 | 0.04119 | 0.10550 | 0.09336 | 0.13195 | 0.01860 |
| SIGNIF | 0.1337 | 0.0102 | 0.0060 | 0.0166 | 0.0027 | 0.0466 | 0.6497 | 0.2455 | 0.3004 | 0.1392 | 0.8416 |

* Indicates significance at the 0,01 (1%) level

The same pattern was found in the relatively high positive correlation coefficients between MVA and earnings per share (EPS) and dividend per share (DPS). Although the correlation coefficients for the total 10 year period were low (0.10 and 0.17 respectively), they were significant at the 1% level. In most of the years, they oscillated between 0.25 and 0.33 and was significant.

The positive correlation of DPS to MVA was higher than that of EPS and it seems that there was a cycle of rising and declining positive correlations - probably because of changes in the business cycle. According to these empirical results, earnings and dividends did matter; the shareholders attach a considerable weight to earnings and the resultant cash benefits.

According to the results of this study, the total debt ratio, total asset turnover and the current ratio had little or no relation to a company's market value, although the total debt ratio had a significant positive correlation coefficient of 0.26 for both 1989 and 1990.

Three different profitability ratios that were correlated with MVA were net operating profit before tax, net operating profit after tax and earnings before interest and tax, all expressed as a percentage of sales. Most of these ratios all had very small correlation coefficients with MVA with no significant appearances. EBIT divided by sales, however, had the highest correlation coefficient for the total 10 year period (0.09 and significant). It seemed that once these ratios were adjusted (downwards) for inflation, their correlation coefficients with MVA also dropped significantly.

According to the results of this study, neither net operating profit nor retained profit expressed as a percentage of capital employed had any significant correlation with the market value of a company.

Three balance sheet efficiency ratios were also correlated with MVA. Capital employed, net working capital and fixed assets were expressed as a percentage of sales. All of these ratios displayed relatively small positive or small negative correlations with MVA.

Ratios that provided a small negative and a small positive correlation coefficients with MVA respectively were the weighted average cost of capital (WACC) and the company cash tax rate. Both these ratios showedan increasing correlation with MVA from 1988 to 1995. It was especially the tax rate that achieved a correlation coefficient of above 0.20 during the last four years under review with two significant correlations (0.25 in 1995 and 0.27 during 1993). Theory predicted that both of these should have had a negative effect on the market value of a company. The correlation coefficients for the total 10 year period, however, were not significant and were -0.01 for WACC and 0.04 for the tax rate.

As found in the other correlation analyses, total owners' interest, total long-term loan capital and total short- term loan capital expressed as a percentage of capital employed had low positive or low negative correlation coefficients with MVA, indicating that the financing structure of a company had little or no effect on its market value, even when adjusted for inflation.

## 5.3 Concluding remarks

One of the most important determinants of a company's MVA is the share price. It has been said that the single most important determinant of share prices is investor mood – whether positive or negative. If a great number of investors descent on the market, all theoretical principles, complex and logical calculations, even reason, are thrown overboard. Share prices are then driven by emotions. Although it is difficult to quantify exactly how large a part of share prices is determined by these illogical (and sometimes unnecessary) investor actions, one must acknowledge that they do play a significant role in setting share prices.

Another possible reason for the relatively low correlation coefficients obtained in this study might lie in the composition of the sample used for the empirical analyses. The EVA values used in the study were from a sample of companies where both positive and negative EVA values were found. If a company is destroying value (a negative EVA value), one may expect the share price (as represented by MVA) to react in a different way from when a company produces positive EVA values. In a study which reveals some similarities to this study, Grant (1997:44) undertook a regression analysis of EVA. However, his sample of companies consisted only of the top 50 wealth creators, as measured by their EVA. Another sample consisted of the 50 worst companies in terms of their EVA. In comparison, the sample used in this study did not discriminate against a company on the basis of its EVA. If one uses a sample of

companies with a dependent variable that is "homogenous" in the sense that it is positive, it is safe to assume that the results, in this case correlation coefficients, will be higher than with a sample that contains a mixture of positive and negative EVA or MVA values.

It is against this background that one must evaluate, compare and summarize the results of the correlation analyses, especially the fact that the highest correlation coefficients obtained were in the region of 0.4.

The highest consistent positive correlation coefficient obtained (in the order of 0.4) was between MVA and EVA **with** inflation adjustments to the data. The very same pattern was obtained with discounted EVA.

Slightly lower positive correlations (0.34 to 0.40) were found between MVA and ROA, ROE, EPS and DPS. These correlation coefficients were higher when data **with** inflation adjustments were utilised. It seemed that, in some ways contrary to the theory, these "well known" ratios were set in the mind of investors and that they were used in determining share prices, or market value. On the basis of this study, this cannot be disputed. Without a doubt, these ratios did have an influence on share prices and the market value of a company in the study. It is, however, doubtful whether these ratios are the best indication, expression or inputs in the calculation of shareholder value.

Positive correlations between MVA and the three profitability ratios were also obtained, although inflation adjustments to the data caused a decrease in the correlation coefficients. The positive influence of these profitability ratios on EPS and DPS supported the positive correlation coefficients obtained between MVA and EPS and DPS respectively.

Variables which expressed asset efficiency and the financing structure of the company displayed very little or no correlation with market value. The same results were obtained with the rest of the variables, especially WACC and the company tax rate.

## 5.4 Conclusion

In a study of this nature, the specific subject is discussed and analysed firstly by means of the relevant literature available. The literature or theoretical principles must be supported by an empirical investigation. It is now appropriate not only to finally compare the theory with the empirical findings, but also to pave the way for one of the most important parts in the whole process: Recommendations concerning the implementation of the findings of the empirical results.

Theory predicted that there should be a high relationship between MVA and EVA. One can state that MVA is equal to the sum of all future discounted EVA. The empirical analyses provided the proof. The correlation coefficient between MVA and discounted EVA was the highest of all the variables and was at its most positive when inflation adjustments to the data had been made. The second highest correlation coefficient was obtained between MVA and normal EVA. Slightly lower positive correlations were also obtained between MVA and more traditional accounting-based corporate performance measures such as return on assets (ROA), return on equity (ROE), earnings per share (EPS) and dividends per share (DPS).

From the above, one can conclude that a relatively high relationship exists between a company's (discounted) EVA and MVA. Other traditional measures cannot be disregarded, however, although they are accounting-based measures subject to the accountants' treatment of their calculated values. The fact that they are positively correlated with MVA is proof of the fact that shareholders and thus the market do regard them as indicators of value created by a company from its operating activities.

In the light of the findings of this study it can be recommended that in order for management to achieve efficient increases in shareholder's wealth, it is necessary to concentrate on increasing a company's EVA. Whilst implementing an EVA management system, or even the calculation of EVA itself, is not easy at all, the rewards will greatly outweigh the costs. There are many advantages of an EVA management system, but one of its best attributes is that the remuneration of a company's management can be tied to the EVA of that company. By doing this, a win-win situation between management and shareholders is created and amongst a host of other positive spin-offs, the agency problem can be eliminated or greatly reduced.

Once it has been determined that EVA is arguably the best indicator of the market value that has been created or destroyed by management, it is logical to analyse EVA in terms of its variables or components in order to determine and quantify the value drivers within a company. This very interesting topic forms the subject of research currently undertaken by the authors of this article.

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