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# ANALYSIS AND INTERPRETATION OF FINANCIAL STATEMENTS

(Part 2)

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*Die skrywer noem sestiën verhoudings wat by die ontleding en vertolking van finansiële state gebruik word. Die eerste groep verhoudings is in die vorige uitgawe bespreek. In hierdie slotdeel word winsgewendheids-, krediet-, stabiliteits-, uitbetalings- en prysverhoudings behandel.*



Mr. H. Qualls,  
Jnr.

## PROFITABILITY RATIOS

**P**ROFITABILITY ratios measure the effectiveness of a company in carrying out its profit-making objective. There is no benefit from a sharp increase in sales or from a large retention of earnings which produce little or no additional profits. This sort of "profit-less prosperity" is not difficult to achieve.

### Profit Margin

Profit Margin is calculated by dividing net profit (after tax and after any preference dividends) for an accounting period or periods by sales for the same period or periods with the result

expressed as percentage. The profit margin is significant in showing the number of cents of net profit which a company is bringing down from each rand of sales. While there is little South African data available, the profit margin for *Fortune's* 500 largest U. S. industrials approximates 5% to 5½%. Indications from the Financial Mail's top 100 companies are that South African profit margins are slightly lower than in the United States.

The adequacy of any profit margin can only be absolutely measured against the results achieved by similar companies in the same industry and not against the average for all companies. For instance, in the U. S. supermarket chain Winn-Dixie Stores, with a 1967 profit margin of 2.3% far outperformed electric power company, Consolidated Edison, which had a 13.2% profit margin in the same year. Supermarket chains which have low fixed assets depend upon a large volume of sales at a low mark-up to obtain a reasonable profit. Winn-Dixie's 2.3% profit margin was far in excess of that of any other of the top 20 U.S. retail food marketers. On the other hand electric power utilities require a tremendous investment in assets to generate and transmit electric power. As the sales per rand of assets are low, a large profit margin is necessary to secure an adequate return on investment. At 13.2% Consolidated Edison's profit margin was well below average for its industry.

<i>Example</i>	1968	1969
Sales	R100,000,000	R120,000,000
Net Profit (AT and PD)	R 10,100,000	R 13,200,000
Profit Margin	10.1%	11.0%

### Asset Turnover

This important ratio measures how many times a company sells or turn over its assets. It is calculated by dividing sales for an accounting period or periods by average assets for the same period or periods with the result expressed as the number of times assets have been turned over per annum.

It is not possible to generalize as to what constitutes a satisfactory asset turnover. Business enterprises in capital intensive industries will experience low asset turnovers while those in industries which derive large sales from relatively

modest investments, such as supermarket chains, could be expected to have high asset turnovers. Companies with high profit margins usually have low asset turnovers and *vice versa*.

<i>Example</i>	1968	1969
Sales	R100,000,000	R120,000,000
Assets	R 33,333,333	R 40,000,000
Asset Turnover	3.0X	3.0X

### Rate of Return on Assets

Rate of return on assets is computed by use of the following formula:

$$\text{Net Profit} \times [\text{Debenture Interest} \times (1 - \text{Company Income Tax Rate})] \div$$

*Tangible Assets (net of depreciation)*

In the above calculation debenture interest is treated as net profit — and income tax is, therefore, deducted from it — as the purpose of this ratio is to determine the return being earned on assets *before considering the cost of any of these assets*. Rate of return on assets is significant in showing the earning power of the firm from operations alone, i.e. before the introduction of earning.

<i>Example</i>	1968	1969
Tangible Assets (net of depreciation)	R100,000,000	R100,000,000
Net Profit	R 10,000,000	R 12,000,000
Debenture Interest	R 1,000,000	R 1,000,000
Rate of Return on Assets	10.6%	12.6%
Income Tax Rate	40%	40%

### Rate of Return on Ordinary Shareholders' Funds

Rate of return on ordinary shareholders' funds is computed by dividing net profit (after tax and after any preference dividends) for an accounting period or periods by average ordinary shareholders' funds (ordinary capital, reserves and unappropriated profits) for the same period or periods and expressing the result as a percentage.

This ratio measures effectiveness in employing the funds belonging to the owners. The most recent rate of return on ordinary shareholders' funds for South African industrial concerns, as adjusted from figures compiled by the Financial Mail, is approximately 11%. This compares with

approximately 12% in the U.S. and 10% in Australia.

While rate of return on ordinary shareholders' funds may be simply determined, the use of the following expanded formula gives a better understanding of the components which combine to determine this rate of return:

Profit Margin x Asset Turnover x Capitalization Ratio = RROS/HF

$$\frac{\text{Net Profit}}{\text{Sales}} \times \frac{\text{Sales}}{\text{Assets}} \times \frac{\text{Assets}}{\text{Ordinary Shareholders Funds}} = \text{RROS HF}$$

Profit margin is the number of cents net profit per rand of sales and shows how effectively sales revenue is being converted to profit.

Asset turnover is the number of rand of sales per rand of assets and indicates how effectively assets are being used to generate sales.

Capitalization ratio is the number of rand of assets per rand of ordinary shareholders' funds and demonstrates the extent to which assets are financed by debt, (both long and short-term) and preference capital — the amount of gearing used.

Profit margin and asset turnover should both be maximized. Capitalization ratio, however, should only be increased to a limited extent because of the risk of violent fluctuation of net profit or even insolvency caused by the necessity of making periodic interest payments on debt regardless of the success of operations.

Action to improve one of these three components must be taken cautiously, as improvement in one area usually causes a decline in another. For instance if additional debt is issued to increase the capitalization ratio, the resultant interest payments will adversely affect profit margin; or if prices are raised to improve profit margin, it is likely that asset turnover will fall. Extreme care must be exercised to make sure that the net result produces an increase in the rate on ordinary shareholders' funds.

Notwithstanding the expected variations in profit margins, asset turnovers and capitalization ratios caused by the differing nature of industries,

every company must measure up to an absolute standard by combining a profit margin, an asset turnover and a capitalization ratio which in toto will produce a satisfactory rate of return on ordinary shareholders' funds. This is the ultimate standard of company performance and any company which is chronically unable to earn a reasonable return should secure new management, offer itself for takeover or cease operations and liquidate.

## CREDIT AND STABILITY RATIOS

Credit and stability ratios are largely balance sheet ratios as opposed to the growth and profitability ratios we have previously examined which are profit and loss statement ratios.

The significance of these ratios lies in the information they provide as to the financial condition of any company to carry on its profit-making and wealth-maximization functions in the future.

### Current Ratio

Current ratio is calculated by dividing current assets at the end of an accounting period by current liabilities at the end of the same period. Although some financial writers have questioned its usefulness, it is generally considered to be a good test of ability to meet short-term obligations. Current ratio was originally formulated around the beginning of this century by American bankers and for years was the only ratio known or used. A hoary old "rule-of-thumb" has evolved that current ratio should be 2 to 1. While 2 to 1 is a *very rough* guide to the general range in which the current ratio will fall, a more accurate determination must be made upon the basis of the nature of the company and of its operations. For example, an airline which sells a service, carries no inventory (for sale to customers), and collects from most of its passengers before transporting them can safely operate with a current ratio of less than 1 to 1 while a department store chain which sells tangible goods, carries large stocks and extends substantial credit should have a current ratio of more than 3 to 1.

<i>Example</i>	1968	1969
Current Assets	R20,000,000	R22,000,000
Current Liabilities	R10,000,000	R10,000,000
Current Ratio	2.0 to 1	2.2 to 1

### Quick Ratio

Quick ratio or "acid test" ratio is the most stringent or acid test of ability to meet short-term obligations. It is a better measurement than current ratio of capability to deal with severe short-term financial crises. Quick ratio is determined by dividing current assets less stocks at the end of an accounting period by current liabilities at the end of the same period. Stocks have been removed from current assets in computing the quick ratio, as they are the least liquid and the most subject to loss of all current assets. Some writers would make the quick ratio a less stringent test by removing bank overdraft from current liabilities. Others would make it more stringent by removing receivables from current assets. A rough guide to a satisfactory quick ratio is 1 to 1. Here again companies which do not extend credit may be able to operate with less than 1 to 1 while companies which have a large credit operation may need well in excess of 1 to 1. However, the degree of acceptable variance in quick ratios will not be so great as in current ratios, because of the exclusion from quick ratio of stocks, the factor causing the most variance among current ratios.

<i>Example</i>	1968	1969
Current Assets	R20,000,000	R22,000,000
Stocks	R10,000,000	R12,000,000
Current Liabilities	R10,000,000	R10,000,000
Quick Ratio	1.0 to 1	1.0 to 1

### Capitalization Ratio

Capitalization ratio is calculated by dividing tangible assets (net of depreciation) at the end of an accounting period by ordinary shareholders' funds at the end of the same period. It is significant in pointing up the extent to which debt, *both short and long term*, has been used in financing assets. The various qualitative factors should be considered in assessing the adequacy of a capitalization ratio.

Any ratio in excess of 2.5 to 1 merits careful examination.

<i>Example</i>	1968	1969
Net Tangible Assets	R100,000,000	R120,000,000
Ordinary Shareholders' Funds	R 60,000,000	R 60,000,000
Capitalization Ratio	1.67 to 1	2.0 to 1

### Coverage of Fixed Charges

Coverage of fixed charges refers to the number of times earnings "cover" or equal fixed charges which consist of debt interest and preference dividends. This ratio is significant in assessing ability to meet fixed charges in a recession or depression when earnings can be expected to decline significantly.

Three formulas are appropriate:

When both debt and preference capital are outstanding:

$$\frac{\text{Net profit (before tax) + debenture interest}}{\text{debenture interest} + [(1 - \text{company tax rate}) \times \text{preference dividends}]}$$

When only debt is outstanding:

$$\frac{\text{Net profit (before tax) + debenture interest}}{\text{debenture interest}}$$

When only preference capital is outstanding:

$$\frac{\text{Net profit (after tax)}}{\text{Preference dividends}}$$

Minimum coverage should equal at least 5 times fixed charges over a period of years and three times in the poorest one of these years. This degree of coverage is necessary to provide the desired "margin-of-safety" to protect against insolvency.

### PAYOUT RATIO

#### Dividend Payout Ratio

Dividend payout ratio is calculated by dividing ordinary dividends for an accounting period or periods by net profit (after tax and after any preference dividends) for the same period or periods with the result expressed as a percentage.

This ratio measures the amount of net profit attributable to ordinary shareholders being paid out in dividends, the remainder being retained within the company. An average company will normally have a dividend payout of something like 50% to 60%. The more successful a company in its operations, as measured by its rate of return on ordinary shareholders' funds, and the greater the recognition given its performance by the market, the price-earnings ratio, the lower should be its dividend payout.

<i>Example</i>	1968	1969
Net Profit (AT and PD)	R2,000,000	R2,500,000
Total Ordinary Dividends	R1,000,000	R1,100,000
Dividend Payout Ratio	50.0%	44.0%

## PRICE RATIO

Price ratios show how the investment community evaluates assets, sales, earnings and dividends of a particular company. They indicate for existing shareholders the success of the financial management in maximizing the wealth of ordinary shareholders and point out areas where improvement may be necessary. For potential shareholders they suggest undervalued possibilities for further investigation.

### Assets per Rand (market price) of Ordinary

Tangible assets (net of depreciation and of liabilities) per rand of ordinary at market price is significant in pointing up the assessment of the company's operations and financial policies by the investment community. It is calculated by dividing the average total tangible assets (net of depreciation and of liabilities) for an accounting period or periods by the average total market valuation of the ordinary shares (market price times number of share) for the same period or periods. If tangible assets are greater than market price, the rate of return on assets and the price-earnings ratio should be examined to determine why the market valuation is low.

<i>Example</i>	1968	1969
Tangible Assets (net of depreciation and of liabilities)	R100,000,000	R120,000,000
Total Market Value of Ordinary Shares	R 50,000,000	R 80,000,000
Assets per Rand of Ordinary	R2.00	R1.50

### Sales per Rand (market price) of Ordinary

Sales per rand of ordinary at market price is calculated by dividing the sales for an accounting period or periods by the average total market valuation of the ordinary shares for the same period or periods with the result expressed as the number of rand of sales per annum for each rand of average market price. It is useful in relating market price to the profit margin and, ultimately, to the rate of return on ordinary shareholders' funds.

<i>Example</i>	1968	1969
Sales	R200,000,000	R220,000,000
Total Market Value of Ordinary Shares	R 50,000,000	R 80,000,000
Sales per Rand of Ordinary	R4.00	R2.75

### Price-Earnings Ratio

The price earnings (P-E) ratio or the multiplier is calculated by dividing the market price of an ordinary share (either the price at a point in time or the average over a period of time) by the earnings per share for a 12 month's period (generally the latest reported 12 months). It is significant in showing the valuation placed by the market on each cent of per share earnings.

A low price-earnings ratio indicates either poor performance in profitability and growth or poor financial public relations and means that the wealth of the ordinary shareholders is not being maximized. Shareholders of a particular company will want as high a price-earnings ratio as possible to maximize the market price of their shares and thus maximize their wealth. Potential investors, on the other hand, will want to invest in companies with low price-earning ratios which they expect will rise in the future. At present the average price-earnings ratio in South Africa is about 12 or 13, and in Australia approximately 10 or 11. Price-earnings ratios in the United States are usually higher, approximately 14 to 18.

<i>Example</i>	1968	1969
Market Price	R 2.24	R 3.00
Earnings per Share	20c	25c
Price-earnings Ratio	11.2X	12.0X

### Dividend Yield

Dividend yield is calculated by dividing dividends per ordinary share for an accounting period by the average market price for the same period with the result expressed as a percentage. It measures the portion of earnings per share distribution to shareholders in relation to the market price of the particular share. No general rule can be laid down as to a reasonable dividend yield. In growth companies, investors usually derive all or almost all of the return they require on their investment in the form of capital gains with a dividend yield of only 1%, 2%, 3% or even nothing.

On the other hand, investors in below average companies will generally obtain all or almost all of their required return on their investment from cash dividends with little or nothing from capital gains. Dividend yields of 7%, 8%, 9% or even more would be reasonable for these companies.

Investors in average companies normally get their required returns from a combination of capital gains and cash dividends with dividend yields approximating 4%, 5% or 6%.

<i>Example</i>	1968	1969
Market-Price	R 2.00	R 2.50
Dividends per Share	13c	15c
Dividend Yield	6.5%	6.0%

It cannot be emphasized too strongly that ratio analysis is not a mechanical process. There are often no hard and fast rules and no right and wrong answers. A current ratio of 2.1 to 1 is not necessarily satisfactory and 1.9 to 1 is not necessarily unsatisfactory. All ratios must be considered in the context of the particular company and the nature of its operations. An important function of ratio analysis is in pointing up things that may not seem just right, in suggesting areas for further examination, study and analysis. Ratio analysis is as much an art as it is a science and after analyzing enough companies, one will develop what might be described as almost a feel for interpreting the ratios.

# LINEËRE PROGRAMMERING

DEUR A. P. L. KOTZE

Operasionele Navorsing,  
S. A. Yster en Staal Industriële  
Korporasie Beperk.

## SYNOPSIS

In this article the general linear programming problem is outlined. Steps in the formulation of the linear programming problem are discussed as well as the limiting assumptions of the linear programming approach. This is followed by a short discussion of the interpretation of the solution to the linear programming problem.