By A. C. Valsamakis

Return on investment – an integrated measure of profitability and performance

Investment basics – VIII

Profit is an appealing and frequently stated objective of the firm. Whilst it has the advantage of providing an easily quantified objective function to guide policy determination, the use of this criterion has come under attack by businessmen, investors and operating managers. Absolute profits are of limited value as measures of performance, unless the profit is related to the resources put to work to produce that profit. By relating absolute profits to the relevant investment base, one can determine how efficiently the funds invested in the business are employed. The employment of capital to maximum advantage and efficiency becomes of paramount importance as firms come under pressure to improve their performance and achieve levels of efficiency to safeguard their survival.

THE RETURN ON INVESTMENT MODEL

The logical basis is to consider the "return on investments" (popularly called ROI) as a measure of overall accomplishment.

$$\text{The rate of return on investment} = \frac{\text{Income (net profit after taxes)}}{\text{Total assets}} \quad (1)$$

The measure has become widely accepted; it not only inherently recognises the value of capital but also provides a basis of divisional evaluation within the firm. Many companies use divisional ROI rates as a basis for appropriating investment funds among the divisions – an exercise which is becoming more important as diversification of business operations gains momentum.

On the surface, equation (1) is straightforward, but its ingredients may differ according to the purpose it is to serve. Management functions may usefully be divided into operating (i.e. utilising a given set of assets) and financing (i.e. obtaining the needed capital).

Operating performance is best evaluated by employing the "Du Pont" system of ROI analysis. First publicised in 1949, this system of financial control has been widely adopted by companies. To estimate ROI involves using items found on both the income statement and balance sheet of a company.

Figure 1 shows these items and how ROI is expressed definitionally as the product of two ratios, profit margin on sales and asset turnover.

THE DU PONT SYSTEM OF FINANCIAL CONTROL

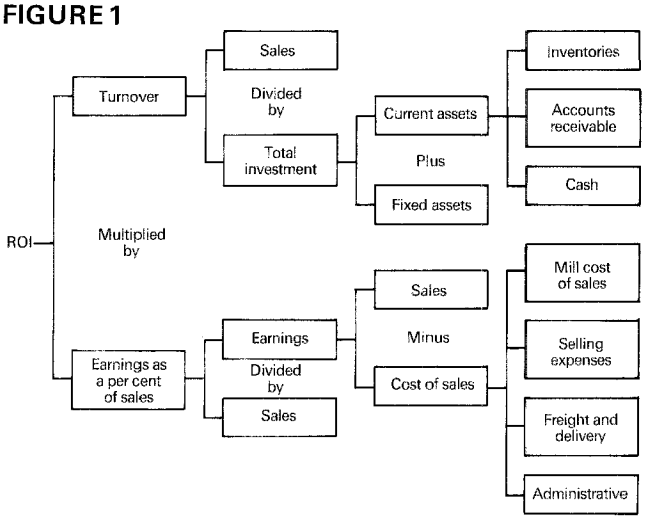
The two ratios suggest the profit paths available to an enterprise. One of these focuses on the balance sheet as it concentrates on efficiency (total assets employed: profits produced); the other path concentrates on profitability, focusing on the income statement, and measuring profit margins on sales.

When the asset turnover ratio, developed in the top area of the model, is multiplied by the profit margin on sales developed in the bottom area, the product is the return on total investment.

This can be seen from the following formula:

$$\text{ROI} = \frac{\text{Net sales}}{\text{Total assets}} \times \frac{\text{Net profits}}{\text{Net sales}} \quad (2)$$

FIGURE 1



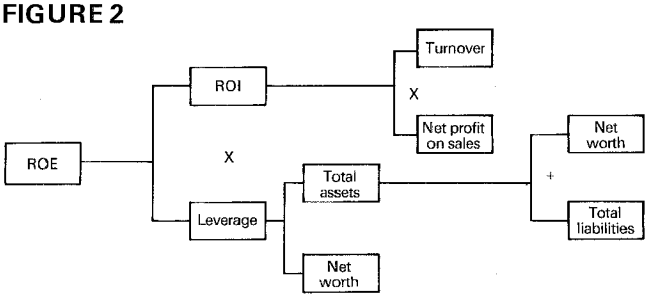
From Financial Executive (July 1965) p. 41

An improvement in either of the two basic factors in profit-making will, by itself, increase the rate of return on investment. The model therefore facilitates the identification of the key issues which will affect the performance of the divisions of a firm. ROI can be tested for sensitivity; should, for example, the cost of goods sold rise (percentage increase) one can compute the resultant drop in ROI (percentage decrease). The model thus identifies the variables which have the most impact on ROI.

EXTENDING THE DU PONT SYSTEM TO INCLUDE LEVERAGE

The measurement of the effectiveness of operations should not be influenced by the management's financial decisions (i.e. manner by which assets are financed). The use of total assets in equation (2) eliminates the effect of the different methods firms use in the financing of assets. However, as almost all business operations are funded by a proportion of borrowed funds, it is necessary to take into account the resultant tax savings through the use of debt. The ROI model can be expanded to define an alternate measure of relative profitability, "return on equity/net worth" or ROE. Figure 2 shows how the original ROI model can be expanded to produce the ROE measure.

FIGURE 2



This measure describes the return provided to the shareholders of the enterprise, or the efficiency with which

common shareholders' equity is being employed within the firm.

ROE can be looked at usefully as the product of three ratios:

$$ROE = \frac{\text{Net sales}}{\text{Total assets}} \times \frac{\text{Net profits}}{\text{Net sales}} \times \frac{\text{Total assets}}{\text{Net worth}} \qquad (3)$$

$$\text{or} = \frac{ROI}{\text{Leverage ratio}}$$

where leverage is defined as total assets/net worth

This formula is useful for showing how financial leverage (use of debt) can be used to increase the rate of return on net worth(*). Increasing return on equity, however, must be considered in the light of increased risk which results from increased debt usage. A discussion of financial risk is, however, beyond the scope of this article – suffice it to say that the amount of leverage employed should not be excessively high, so there are limitations to the practice.

INTERFIRM COMPARISONS OF ROI AND ROE – SOME CAVEATS

Rates of return for a company as a whole are sometimes compared with those of other companies or with industry averages to determine the relative degree of success. Comparison is an essential step in the analysis of quantitative data, but, for such comparisons to be valid, certain difficulties that arise in the computation of ROI need to be taken cognisance of. The problems are directly related to the vagaries of the accounting system and revolve around issues such as:

- defining 'profit' so that it is consistent with the definition of the investment base to which it is related (should interest expense and income taxes be ordinarily excluded?, etc.)
- in computing the turnover ratio, what method of sales recording do the companies employ and how is the total investment measured? The latter's constituents are fixed and current assets. Are fixed assets to be valued at book value, net realisable value or replacement cost? What methods of inventory valuation are employed, FIFO or LIFO?, etc.

It may therefore be necessary when comparing ROIs and ROEs of companies to make some adjustments to achieve comparability.

The model nevertheless suggests an integrated approach to measuring performance and embodies strategic issues for all managers and those whose concern is the analysis and interpretation of financial statements.

(*) There are limitations on this statement – specifically, ROE increases with leverage only if ROI exceeds the rate of interest on debt, after considering the tax deductability of interest payments.

REFERENCES

Andrews, G. *"Decomposing return on investment"*, Boardroom, 1978.

Horngren, C. T. *"Accounting for Management Control"*, Prentice Hall, 1965.