Value metrics: use with care

Using accounting rates of return as a measure of value is simple in theory, but tricky in practice. Chris Higson explains the issues and adds a note of caution.

Accounting rates of return on capital are used to measure economic return in business and to identify whether companies are creating or destroying value. Investors use accounting returns to rank companies when selecting stocks. Value-based management has encouraged companies to use accounting returns for measuring performance and in compensation schemes for managers. Regulators and competition authorities use accounting returns to identify excess profits.

In all these applications, accounting returns are being used as value metrics in the sense that they are being compared, explicitly or implicitly, to the cost of capital. This is a stern test of accounting data and in this article the reliability of accounting returns as value metrics is discussed.

We can see why, in principle, an accounting rate of return on capital measures economic return by recalling some basic investment theory. An activity creates value when it is expected to produce cash flows with a higher value than if the resources were put to their next best use. Assume the resources are assets and capital is not rationed (so the activity is not competing for funds against other projects). Then the test of value creation is whether the value of the expected cash flows from using the assets, discounted at the company’s cost of capital, is greater than the cost of the assets.

If a company buys £10m of assets today and uses them to generate a cash flow worth £12m today, it has created £2m of value. In the language of capital budgeting, the investment has a net present value (NPV) of £2m.

Equivalently, value is created when the expected cash flows net of investment have a yield or internal rate of return (IRR) which is greater than the cost of capital.

Since there is a close relationship between value and return, we can judge economic performance in either way, by examining the quantity of value created, or by comparing a rate of return to the cost of capital. (Note that NPV and IRR are equivalent ways of thinking about economic performance apart from cases when internal rates of return are ambiguous. These cases are explored in standard finance texts.)

### The widget project

My grandmother has provided £10,000. On January 1, I will rent a room, buy a widget press for £8,000 and invest £2,000 in an inventory of widget blanks. I will trade for a year, making and selling widgets. I expect to receive cash from customers of £15,000 and to spend another £6,000 for widget blanks and £2,000 for rent. I estimate the machine could be sold for £5,000 at the end of the year.

At the end of the year, therefore, I will be left with a machine worth £5,000, no inventory and receivables of £1,500 from customers who have yet to pay. Is the project worth doing? Note that my grandmother got the money by selling some of her equities and these equities were expected to return 8 per cent on average, so 8 per cent is the opportunity cost of the capital used in the project.

Using the techniques of capital budgeting we would appraise the project by calculating its IRR and its NPV. As is conventional (though crude) we assume all revenues are collected as cash, and expenses paid in cash, at the end of the year (date 1), apart from the investment which is made at the beginning of the year (date 0). Also assume the machine can be sold, and the outstanding receivables collected, on the last day of the year, and there is no tax.

### Table 1

#### DCF analysis of the widget project

<table>
<thead>
<tr>
<th>Date 0</th>
<th>Date 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Investment in machine and inventory</td>
<td>(10,000)</td>
</tr>
<tr>
<td>Operating cash flow (15,000 – 6,000 – 2,000)</td>
<td>7,000</td>
</tr>
<tr>
<td>Realise the assets (machine, 5,000, receivables, 1,500)</td>
<td>6,500</td>
</tr>
<tr>
<td>Total</td>
<td>13,500</td>
</tr>
</tbody>
</table>

For a single period project, the IRR is easy to calculate as follows:

\[
\text{IRR} = \left( \frac{13,500}{10,000} \right) - 1 = 0.35 = 35\%
\]

The present value of the future cash flow is given by:

\[
\left( \frac{13,500}{10,000} \right) = 1.35 = 35\%
\]

So the NPV of the project is no tax. Table 1 shows a discounted cash flow (DCF) analysis for the widget project.

The present value of the future cash flow is given by:

\[
\frac{13,500}{10,000} = 1.35 = 35\%
\]

The NPV of the project is £2,500, or £13,500/(1.25^1) – £10,000. An enterprise-level measure of return in the sense that operating assets are financed by both equity and loans. The return to investors is measured by return on equity, which is earnings (after interest paid and tax) divided by equity shareholders’ funds.

Since earnings are after-tax, return on equity can be benchmarked against the cost of equity capital. However, to find an enterprise-level return on capital (which in this case will be benchmarked against WACC, the weighted average cost of the loan and equity capital) we will need to calculate an after-tax operating return. A moment’s thought suggests that this will not be entirely straightforward. We need a...
measure that is pre-interest paid, but after tax, which is not the order of things in the income statement. The problem is that the tax reported in the income statement contains tax paid on operating profit but also the tax paid on other income, less tax saved on interest payments. We resolve this by calculating net operating profit after tax (NOPAT), where T is the corporate tax rate, as:

\[
\text{NOPAT} = \text{Operating profit} - (\text{Tax} \times \text{Net interest paid} x T)
\]

We can also get at NOPAT by working up from profit after tax:

\[
\text{NOPAT} = \text{Profit after tax} - \text{Net interest paid} x (1 - T)
\]

We then have:

After-tax operating return \(= \) NOPAT/(Operating assets)

Take the example of Brigand & Co, which has the following data:

| Operating profit | 100 |
| Interest received | 10 |
| Profit before tax | 90 |
| Tax | 25 |
| Earnings | 65 |

Brigand has average operating assets of 500. The local corporate tax rate (T) is 35 per cent. To find NOPAT, which is operating profit after tax, we need to know the tax on the operating profit. The actual tax paid is 25, but this reflects the fact that the company got a tax deduction at 35 per cent on its net interest payments of 2%, a deduction of 7. So tax on operating profit must have been:

\[25 + 7 = 32\]

and NOPAT is:

\[100 - 32 = 68\]

Though the statutory tax rate is 35 per cent, Brigand’s effective tax rate is 25 per cent and it is not 35 per cent of 100. Taxable profit reflects the various allowances (and disallowables) in the tax code, carried-forward losses, investment tax credits and so forth. The NOPAT calculation reasonably assumes that interest paid (received) is deducted (taxed) at the marginal, statutory, rate and that the tax breaks that reduce the effective tax rate relate to operating profit.

An alternative way of getting NOPAT is from the bottom-up, working back from earnings. NOPAT is profit after tax plus after-tax interest paid, net of the tax shelter on interest. In Brigand’s case this is \(20 - 7 = 13\). So,

\[\text{NOPAT} = 55 + 13 = 68\]

Brigand’s after-tax operating return is thus 68/500 = 13.6 per cent.

Internalising the cost of capital

In the Brigand example, if the WACC was 8 per cent we would conclude that after-tax operating return of 13.6 per cent reflected superior performance. The difference between return and cost of capital is called spread. Brigand’s spread was 5.6 per cent.

The same data can be presented in a different way. If we make a charge against NOPAT for the cost of using capital as operating assets during the year, the surplus is residual income.

\[\text{Residual income} = \text{NOPAT} - \text{(Operating assets x WACC)}\]

Brigand had a NOPAT of 68 and assets of 500. Its WACC is 8 per cent, so its residual income is:

\[68 - (500 \times 8\%) = 28\]

Residual income is also known as economic value added (EVA) and economic profit. The term “EVA” was coined by Dr. Andrew P. Stewart. Its version of EVA also incorporates a number of accounting adjustments, designed to correct shortcomings of current accounting.

Great claims are made for residual income measures, but the statement that a company has positive residual income is logically identical to saying it is earning a return greater than the cost of capital. Both metrics hold the same information. In simple terms, when we ask if a company is earning a return greater than the cost of capital, we are asking whether:

\[\text{Profit/Capital} > \text{WACC}\]

Earnings must be comprehensive, or in current parlance, “clean-surplus”. Second, the balance sheet needs to be complete in that it records all the assets and claims over which property rights have been established. Third, these assets and claims need to be valued at opportunity cost.

In practice, accounting rarely meets either of these ideal and though practising analysts and consultants make adjustments to the reported numbers, the goal remains elusive. There are three problems areas.

Comprehensive income

The traditional role of the income statement is to describe profit from operations. But, for example, part of the return that a company delivers to its investors may take the form of unrealised holding gains on assets such as real estate. These may not be recognised, but even when they are, they will rarely be passed through the income statement. Earnings will not be comprehensive if key balance sheet changes, such as gains and losses on foreign exchange, and gains and losses on revaluation, are taken direct to reserves in the balance sheet rather than passed through earnings.

Balance sheet completeness

There are two main reasons why the balance sheet may be incomplete:

1. The list of assets and liabilities is incomplete.
2. The current values of assets and liabilities are not recorded.

In the first type of incompleteness, balance sheet items are simply missing. In the second type, balance sheet items do not reflect current values. Internationally, revaluation of fixed assets is either permitted, as in the US, or has unfavourable tax consequences, as in much of Europe. In the Netherlands and the UK, where revaluation is allowed, it is found predominantly in property-rich sectors such as hotels and drinks, where it is occasional and partial – not all asset classes are necessarily revalued. It is also often the case that rather than built, intellectual property assets are sometimes carried in the balance sheet, these are never revalued. It is also common for analysts to attempt to express fixed assets in current prices. Current assets and liabilities are more likely to approximate current values. It is rare for short-life assets they are carried at reasonably current prices and have to be written down to realisable value when this falls below cost.

The reliability of a value metric depends critically on the quality of the accounting data. The above is just an outline, it does not go into how and why capital is measured, nor does it look into the starting point of the accounting system. The article has argued that the reliability of capital budgets depends critically on the quality of the accounting system. The above is just an outline, it does not go into how and why capital is measured, nor does it look into the starting point of the accounting system.