8

MEASURES OF VALUE CREATION

Introduction

Managers at all levels need to establish plans for future actions. In drawing up these plans they need reliable measures of value to choose between alternative paths. The metrics discussed in this chapter are useful for this purpose.

Then, as strategic moves at both the corporate level and the business unit level unfold, managers need to monitor progress to see if they are still on-track to create value. Again, these metrics can be useful. Targets can be set, and, as milestones are passed, incentive schemes can bestow a share of the value created on those responsible. The aim is to make sure every member of staff understands what value is, and each person becomes fully committed to creating it.

At each level of responsibility there should be knowledge of how much of the finance provider's cash has been used in an SBU, product line or project and the required rate of return on that capital. Everyone should know that extra rewards flow to those that help achieve returns above the required rate of return.

The metrics discussed in this chapter quantify the plan, targets and incentives to encourage high performance from the boardroom to the shop floor. They can be used to judge the entire firm or just a small part of it.

Using cash flow to measure value

We discuss a number of measures of value in this and the next chapter. There is a hot debate between rival consultants as to which is the best for guiding managers seeking to create value. However, they all agree that the measure that lies at the theoretical heart of all the others is discounted cash flow.

In Chapter 2 the value of an investment is described as the sum of the discounted cash flows (NPV). This principle was applied to the assessment of a new project: if the investment produced a rate of return greater than the finance provider's opportunity cost of capital it is wealth enhancing. The same logic can be applied to a range of different categories of business decisions, including:

- resource allocation
- business unit strategies
- corporate level strategy
- motivation, rewards and incentives.

Consider the figures for Gold plc in Table 8.1. These could refer to the entire company. Alternatively the figures could be for business unit returns predicated on the assumption of a particular strategy being pursued, or they could be for a product line. (Note: to understand this chapter the reader needs the concepts and tools developed in Chapter 2 and its appendix. You may want to refresh your knowledge of basic discounted cash flow analysis before proceeding.)

TABLE 8.1

Gold plc forecast cash flows

Required rate of return = 12% per annum

Year	1	2	3	4	5	6	7	8 and subsequent years
	£	£	£	£	£	£	£	£
Forecast profits	1,000	1,100	1,100	1,200	1,300	1,450	1,600	1,600
Add book depreciation and other non-cash items (e.g. amortization of goodwill)	500	600	800	800	800	800	800	800
Less fixed capital investment	–500	–3,000	–600	–600	–300	–600	–800	–800
Less additional investment in working capital*								
Inventory	50	–100	–70	–80	–50	–50	–50	0
Debtors	–20	–20	–20	–20	–20	–20	–20	0
Creditors	10	20	10	10	20	20	30	0
Cash	–10	–10	–10	–10	–10	–10	–10	0
Add interest previously charged to profit and loss account	100	150	200	200	200	200	200	200
Taxes	–300	–310	–310	–420	–450	–470	–550	–550
Cash flow	830	–1,570	1,100	1,080	1,490	1,320	1,200	1,250
Discounted cash flow	$\frac{830}{1.12}$	$-\frac{1,570}{(1.12)^2}$	$+\frac{1,100}{(1.12)^3}$	$+\frac{1,080}{(1.12)^4}$	$+\frac{1,490}{(1.12)^5}$	$+\frac{1,320}{(1.12)^6}$	$+\frac{1,200}{(1.12)^7}$	$+\frac{1,250}{0.12}\times\frac{1}{(1.12)^7}$
	741	**–1,252**	**783**	**686**	**845**	**669**	**543**	**4,712**

*A positive figure for inventory, debtors and cash floats indicates cash released from these forms of investment. A negative figure indicates additional cash devoted to these areas. For creditors a positive figure indicates higher credit granted by suppliers and therefore a boost to cash flows.

Table 8.1 starts with forecasted profit figures and then makes a number of adjustments to arrive at cash flow figures. This method is valuable because it reflects the corporate reality that forward estimates for business units are usually in the form of accounting budgets rather than cash flows, and managers need to know how to work from these numbers toward cash flow rather than starting from scratch to obtain reliable cash flow projections.

Profit figures are created after a number of deductions, such as depreciation, that do not affect the company's cash flow for the year. When an item is depreciated in the accounts profits are reduced but no cash is lost. It is only when capital items are paid for that cash actually flows out, so depreciation is added to the profit figures. Instead of depreciation we take away the amount that actually flows out each year for investment in fixed capital equipment such as factories, machinery and vehicles (fixed capital investment).

In drawing up the profit figures the accountant does not recognize the using-up of shareholder's cash when inventory (e.g. raw materials stock) or debtors (granting credit to customers) are increased. The accountant observes one asset (cash in hand) being replaced by another (inventory, money owed by customers) and so there is no expense to deduct. However, the cash flow analyst sees cash being used for these items as the business grows and so makes an adjustment to the profit figures when deriving the cash flow numbers.

Similarly, if cash is tied up in cash floats to run the business (e.g. cash in the tills of a betting shop or food retailer) the fact that this cash is no longer available to shareholders needs to be recognized. So, if shareholders had to supply extra cash floats in a period this is deducted from the profit numbers when trying to get at cash flow.

Whether suppliers send input goods and services to this firm for payment on 'cash on delivery terms' or 'credit terms' the accountant, rightly, records the value of these as an expense, and deducts this from the profit and loss account, in the year of delivery. The cash flow analyst needs to make an adjustment here because the full amount of the expense may not yet have flowed out in cash. So, if creditor balances increase we need to recognize that the profit and loss account has overstated the outflow of cash. We need then to add back the extent to which the creditor amount outstanding has increased from the beginning of the year to the end to arrive at the cash flow figure.

We also add back the interest charged to the profit because the 12 percent discount rate already includes an allowance for the required return to lenders (see Chapter 10). To include a deduction for interest in calculating cash flow would be to double count this element.

The cash flow figures at the bottom of the columns are sometimes referred to as 'free cash flow'. That is they represent the amount that is free to be paid out to the firm's investors (shareholders and debt holders). These amounts could be paid out without affecting future cash flows because the necessary investment for future growth in the form of fixed capital items and working capital (inventory, debtor, cash floats less trade credit) is already allowed for.

The total of the discounted cash flows provides us with a value of the SBU (or firm, etc.) after taking into account all the cash inflows/outflows and reducing those distant cash flows by the required rate of return (the opportunity cost of capital). This discount rate is based on a blend of the required return to shareholders capital and the required return to debt holders capital. Chapter 10 describes the logic behind the derivation of the discount rate, which is a weighted average of the required returns to equity and debt.

By examining the discounted cash flow the SBU management and the firm's managing director can assess the value contribution of the SBU. The management team putting forward these projected cash flows could then be judged and rewarded on the basis of performance targets expressed in cash flow terms. On the other hand, the cash flows may refer to a particular product line or specific customer(s). At each of these levels of management a contribution to overall corporate value is expected.

The planning horizon[1] is seven years and so the present value of the future cash flows is:

Present value of cash flows within planning horizon	+	Present value of cash flows after planning horizon
741 – 1,252 + 783 + 686 + 845 + 669 + 543	+	4,712
£3,015		£4,712 = **£7,727**

In analysis of this kind it is not unusual to find that most of the value arises after the planning horizon. However, bear in mind that it is the actions (strategic positioning etc.) and the investments made within the planning horizon that creates the platform for these high post planning horizon free cash flows.

Note that in the case of Gold we have not shown a large initial cash outflow, in contrast to the NPV calculations described in the first part of the book. This is to illustrate how you can use discounted cash flow analysis to analyze the present value of the future cash flows (not *Net* present value) of an SBU etc. that was established years before, and you do not have the start-up costs to consider – this type of analysis only considers the future cash inflows and outflows, not the bygone (sunk?) costs.

The value shown in the calculation based on one particular strategic direction (say the result from Table 8.1) can be compared with alternatives to see which is likely to provide the highest value. You could also conduct sensitive and scenario analysis (see Chapter 5) to highlight areas of concern and in order that managerial attention may be directed to reduce the probability of a poor outcome.

Corporate value

If the SBU that we are valuing has other assets that are not used in the creation of free cash flow and those assets have a market value then we add this to the total of the discounted operational cash flow to arrive at the total firm value. For example, many firms hold portfolios of shares or bonds as investments with no connection to the firm's operations. The market value of these adds to the value of the firm derived from the operational free cash flow. Likewise, if a company owns an empty and unused factory which could be sold its value can be added to the total.

Corporate value (enterprise value)	=	Present value of free cash flow from operations	+	Value of non-operating assets

Comparing the discounted free cash flows with alternatives

The figure of £7,727 is the present value of all the future operating cash flows. An alternative course of action is to sell off the SBU's assets, either piecemeal or as a whole. We should compare these alternatives with the present value of continuing to own and run the business. The opportunity cost of following the strategy is the value of the best forgone alternative.

Shareholder value from operations

If the value of debt is deducted from the total present value from operations we derive the value belonging to shareholders. So, if we assume that this SBU has £3,000 of debt the shareholder value before taking account of non-operational assets is £4,727.

Total discounted free cash flow from operations	–	Debt	=	Shareholder value from operations
£7,727	–	£3,000	=	£4,727

The term 'debt' here extends beyond interest bearing debt to include finance lease obligations, under funded pension plans and contingent liabilities.

Real management is not about precise numbers – it's about what lies behind the numbers

By embarking on cash flow based analysis the decision-maker is forced to investigate and understand the underlying business. Only by thorough examination is he/she going to put realistic numbers into the future projection table. This means a knowledge of the competitive environment and the extraordinary resources that the firm possesses to produce high returns in its chosen industry(ies) – see Chapter 7. In other words, the decision-maker needs to investigate the key 'value drivers' in the company and the industry.

However there is a trap here for the unwary and ill-informed. A manager lacking the intellectual tools, theoretical frameworks and facts to carry out high quality strategic analysis will produce simplistic and misleading input numbers to the cash flow forecasts: GIGO – garbage in/garbage out.

Value-based management is not a mechanical discipline. It is not about inputting a few numbers to a computer program and then waiting until *the* answer pops out. It is a process requiring judgment every step of the way; it requires careful reflection on the results and their sensitivity to the input numbers. Deep thought is required to appreciate the impact of making slightly (or greatly) different judgments on the input variables; and in assessing the probabilities of variations occurring. Value-based management is a decision-making-in-a-haze-of-uncertainty discipline. How can it be otherwise if it is to be useful in the real world of unpredictability and vagueness. But it gives us a framework and the tools for navigating the best judged route given these circumstances.

A premium is put on people who can make good judgment calls despite the imprecision. These people search for more data to try to see through the haze of the future. More data also leads to thought and action designed to reduce the range of probable outcomes.

Investment after the planning horizon

After the planning horizon annual cash flows may well differ from the figure of £1,250 due to additional investment in fixed and working capital items but this will make no difference to present *value* as any new investment made (when discounted) will be the same as the discounted value of the future cash inflows from that investment. In other words, the company is able to earn merely the required rate of return from Year 8 onwards so no new investment can create value. For example, suppose that Gold raised additional funds of £1,000 and at the end of Year 9 invested this in a project generating a perpetual annual net cash inflow of £120 starting at time 10. When these figures are discounted to time 0 the NPV is zero:

Present value of cash outflow $\dfrac{£1{,}000}{(1.12)^9} = -360.61$

Present value of cash inflows $\dfrac{£120/0.12}{(1.12)^9} = +360.61$

Thus incremental investment beyond the planning horizon generates no incremental value and so can be ignored for value calculations.

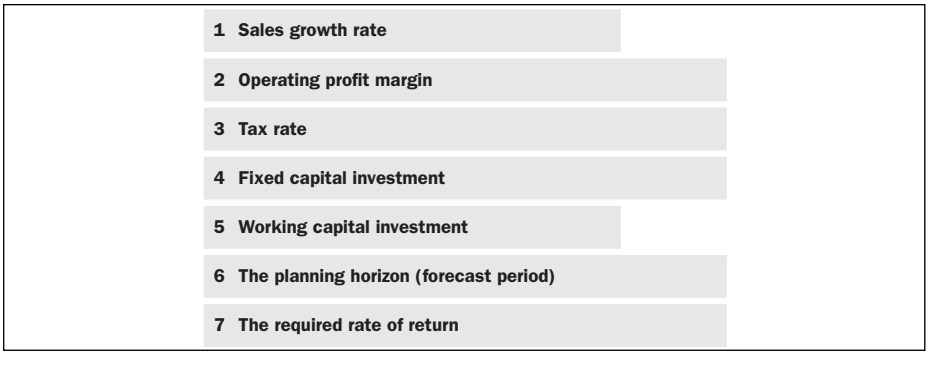
The connection with stock market valuation

The kind of discounted cash flow analysis illustrated in Table 8.1 is used by financial institutions to value shares. (In these cases interest paid to lenders is subtracted to determine the cash flow attributable to shareholders which is then discounted at the required return for shares of that risk class – not a weighted average cost of capital including the return to debt holders – see Chapter 13.) Given the emphasis by the owners of the firm on cash flow generation it would make sense for managers when evaluating strategies, projects, product lines and customers to use a similar method.

Shareholder value analysis

Alfred Rappaport (1998) has taken the basic concept of cash flow discounting and developed a simplified method of analysis. In the example of Gold plc (*see* Table 8.1) the component elements of the cash flow did not change in a regular pattern. For example, fixed capital investment was ten times as great in Year 2 as in Year 5. Rappaport's shareholder value analysis assumes relatively smooth change in the various cash flow elements from one year to the next as they are all taken to be related to the sales level. Rappaport's seven key factors which determine value are as set out in Figure 8.1.

FIGURE 8.1
Rappaport's value drivers



Rappaport calls the seven key factors value drivers, and this can be confusing given that other writers describe a value driver as a factor that enables some degree of competitive advantage. To distinguish the two types of value driver the quantitative seven listed in Figure 8.1 will be referred to as Rappaport's value drivers. To estimate future cash flows Rappaport assumes a constant percentage rate of growth in sales. The operating profit margin is a constant percentage of sales. Profit here is defined as profit before deduction of interest

and tax, PBIT. The tax rate is a constant percentage of the operating profit. Fixed capital and working capital investment are related to the *increase* in sales.

So, if sales for the most recent year amount to £1m and are rising by 12 percent per year, the operating profit margin on sales[2] is 9 percent, taxes are 31 percent of operating profit, the incremental investment in fixed capital items is 14 percent of the *change* in sales, and the incremental working capital investment is 10 percent of the *change* in sales, the cash flow for the next year will be as set out in Table 8.2.

TABLE 8.2
Silver plc: sales, operating profit and cash outflows for next year

Sales in year 1	
= Sales in prior year × (1 + Sales growth rate)	
= 1,000,000 × 1.12	
	1,120,000
Operating profit	
= Sales × Operating profit margin	
= 1,120,000 × 0.09	
	100,800
Taxes	
= Operating profit × 31%	
= 100,800 × 0.31	
	–31,248
Incremental investment in fixed capital	
= Increase in sales × Incremental fixed capital investment rate	
= 120,000 × 0.14	
	–16,800
Incremental investment in working capital	
= Increase in sales × Working capital investment rate	
= 120,000 × 0.10	
	–12,000
Operating free cash flow	£40,752

Using shareholder value analysis to value an entire company

Corporate value is the combined value of the debt portion and equity portion of the overall capital structure:

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

The debt element is the market value of debt, such as long-term loans and overdrafts, plus the market value of quasi-debt liabilities, such as preference shares. In practical shareholder value analysis the balance sheet book value of debt is often used as a reasonable approximation to the market value. The above equation can be rearranged to derive shareholder value:

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

Rappaport's corporate value has three elements, due to his separation of the discounted cash flow value of marketable securities – these are assets not needed in operations to generate the business's cash flows – from the cash flows from operations (*see* Figure 8.2). The value of the marketable securities is expressed as their current market price.

FIGURE 8.2
Rappaport's corporate value

Corporate value	=	Present value of operating cash flows within the planning horizon ('forecast period')	+	Present value of operating cash flows after the planning horizon	+	The current value of marketable securities and other non-operating investments, e.g. government bonds

Free cash flow is the operating cash flow after fixed and working capital investment; that which comes from the *operations* of the business. It excludes cash flows arising from, say, the sale of shares by the company or bond issue. It also excludes payments of interest or dividends (*see* Figure 8.3).

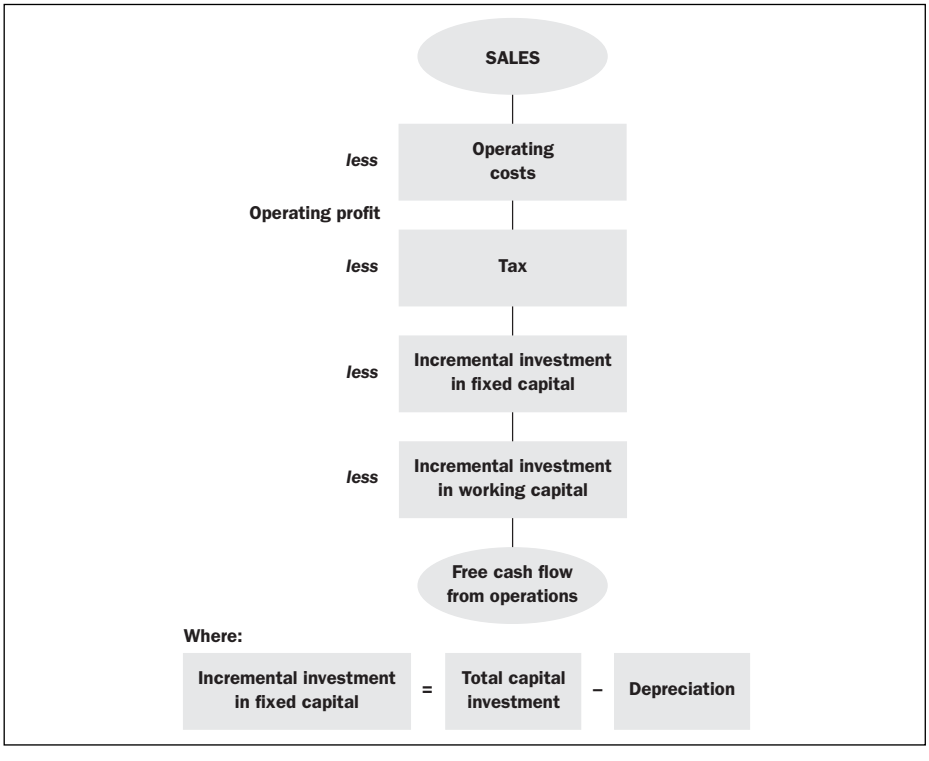
A closer look at depreciation and investment in fixed capital

Investment in plant, machinery, vehicles, buildings, etc. consists of two parts.

- *Type 1*. Annual investment to replace worn-out equipment and so on, leaving the overall level of assets constant.
- *Type 2*. Investment that adds to the stock of assets, presumably with the intention of permitting growth in productive capacity. This is called incremental fixed-capital investment.

A simplifying assumption often employed in shareholder value analysis is that the 'depreciation' figure in the profit and loss account is equal to the Type 1 investment. This avoids the necessity of first adding back depreciation to operating profit figures and then deducting Type 1 capital investment. It is only necessary to account for that extra cash outflow associated with incremental fixed capital investment. Free cash flow therefore is as defined in Figure 8.3.

FIGURE 8.3
Rappaport's free cash flow



Illustration

We can calculate the shareholder value of Silver plc by using Rappaport's seven value drivers if we assume a planning horizon of eight years and a required rate of return of 15 percent (*see* Tables 8.3 and 8.4).

TABLE 8.3
Rappaport's value drivers applied to Silver plc

1	Sales growth	12% per year
2	Operating profit margin	9% of sales
3	Taxes	31% of operating profit
4	Incremental fixed capital investment	14% of the change in sales
5	Incremental working capital investment	10% of the change in sales
6	The planning horizon (forecast period)	8 years
7	The required rate of return	15% per year

The company also has £60,000 of investments in foreign and domestic shares and £50,000 in long-term fixed interest rate securities. These are assets not required to produce operating profit and can be sold off with the proceeds given to their owners, i.e. the shareholders.

TABLE 8.4
An example of shareholder value analysis – cash flow calculation

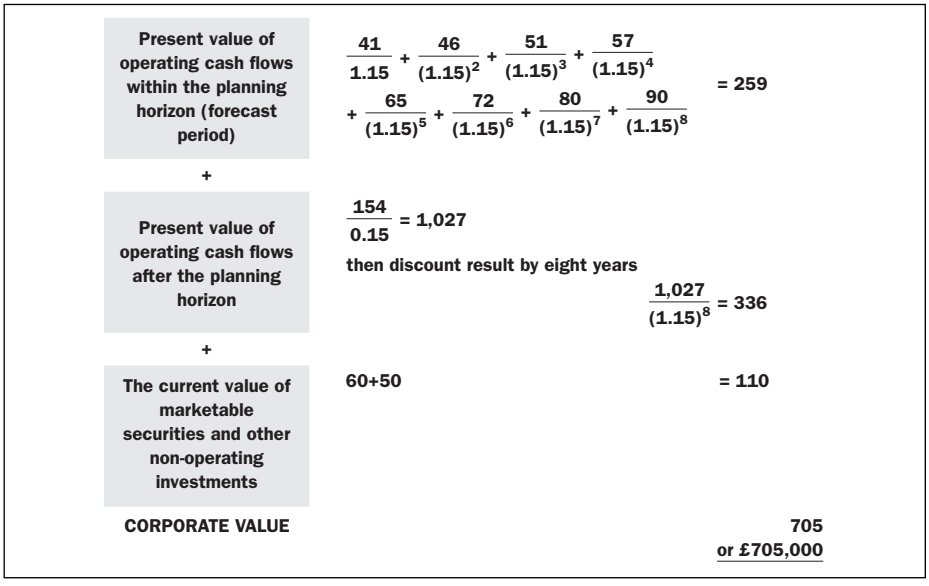
Year	0	1	2	3	4	5	6	7	8	9 and sub-sequent years
£000s										
Sales	1,000	1,120	1,254	1,405	1,574	1,762	1,974	2,210	2,476	2,476
Operating profits		101	113	126	142	159	178	199	223	223
Less taxes		–31	–35	–39	–44	–49	–55	–62	–69	–69
Less incremental investment in fixed capital		–17	–19	–21	–24	–26	–30	–33	–37	0
Less incremental working capital investment		–12	–13	–15	–17	–19	–21	–24	–27	0
Operating free cash flow		41	46	51	57	65	72	80	90	154

Note: All figures are rounded to whole numbers. There is no additional investment in fixed assets and working capital after year 8 shown. This indicates that the perpetual cash flow of 154 can be produced without expanding the physical capacity of the firm (no new factories, etc.). However, investment in the form of replacement of existing facilities subject to wear and tear is taking place, equal to the depreciation amount deducted before the figure for operating profits is input to the analysis. Investment above and beyond this replacement investment may take place, but it has no impact on the value calculation because investment after the planning horizon generates a return equal to the required rate of return, i.e. there is no performance spread for these assets, and so such investment is ignored for the calculation of firm value.

Corporate value is as set out in Figure 8.4.

The required rate of return in shareholder value analysis is the weighted average required return on debt and equity capital which allows for a return demanded by the debt holders and shareholders in proportion to their provision of capital (see Chapter 10). This explains why cash flows before deduction of interest are discounted rather than just those attributable to shareholders: some of those cash flows will go to debt holders. The discounted cash flows derived in this way are then summed to give the corporate value (sometimes called enterprise value). When debt, in this case, £200,000, is deducted, shareholder value is obtained.

FIGURE 8.4
Corporate value



$$\text{Shareholder value} = \text{Corporate value} - \text{Debt}$$
$$\text{Shareholder value} = £705{,}000 - £200{,}000 = £505{,}000$$

Again, this kind of analysis can be used at a number of different levels:

- whole business
- division/SBU
- operating unit
- project
- product line or customer.

Strategy valuation using shareholder value analysis

The quantitative evaluation of alternative strategies in terms of value creation can assist strategic choice. It is advisable when applying shareholder value analysis to a business unit or corporate level strategy formulation and evaluation to consider at least four alternative strategic moves:

- a continuation of current strategy – 'base-case' strategy;
- liquidation;
- trade sale (selling the entire business to another firm) or spin-off (selling a business unit, while perhaps retaining a stake);
- new operating strategy.

Imagine that the company we have been using to explain shareholder value analysis is involved in the production of plastic guttering for houses and the shareholder value figure of £505,000 represents the base-case strategy, consisting of relatively low levels of incremental investment and sales growing at a slow rate.

Alternatives

- The company has recently been approached by a property developer interested in purchasing the company's depot and offices for the sum of £400,000. Other assets (vehicles, inventory, machinery) could be sold to raise a further £220,000 and the marketable securities could be sold for £110,000. This liquidation would result in shareholders receiving £530,000 (£400,000 + £220,000 + £110,000 – £200,000). This liquidation option produces slightly more than the base-case strategy.
- The third possibility is a trade sale or spin-off. Companies can sell separable businesses to other firms or float off strategic business units or groups of SBUs on the stock market. Kingfisher split itself in 2003 into a DIY company (B&Q etc.) and an electrical retailing company (Kesa, with Comet, Darty and BUT etc.), each with a separate quotation. In the case of the fictional guttering firm, it is too small to obtain a separate quotation for component parts, and its operations are too well integrated to allow a trade sale of particular sections. However, in the past shareholders have been approached by larger competitors to discuss the possibility of a takeover. The three or four major industry players are trying to build up market share with the stated aim of achieving 'economies of scale and critical mass' and there is the distinct impression that they are being over-generous to selling shareholders in smaller firms – they are paying 'silly prices'. The management judge that if they could get a bidding war going between these domineering larger firms they could achieve a price of about £650,000 for shareholders.
- The fourth possibility involves an expansion into a new product area of multicolored guttering. This will require large-scale investment but should result in rapidly rising sales and higher operating margins. The expected Rappaport value drivers are as set out in Table 8.5. Note the increased investment in capital items. Also note the higher risk of this strategy compared with the base-case is reflected in the increased discount rate from 15 to 16 percent.

TABLE 8.5
Rappaport's value drivers applied to an expansion of Silver plc

1	Sales growth	25% per year
2	Operating profit margin	11% of sales
3	Taxes	31% of operating profit
4	Incremental fixed capital investment	15% of the change in sales
5	Incremental working capital investment	10% of the change in sales
6	The planning horizon (forecast period)	8 years
7	The required rate of return	16% per year

The guttering firm's shareholder value under the new strategy is as set out in Table 8.6. This shows that there are lower cash flows in the first three years with this strategy compared with the base-case strategy because of the increased investment, yet the overall expected shareholder value rises from £505,000 to £1,069,000.

TABLE 8.6
The guttering firm's shareholder value under the new strategy

Year	0	1	2	3	4	5	6	7	8	9 and sub-sequent years
£000s										
Sales	1,000	1,250	1,563	1,953	2,441	3,052	3,815	4,768	5,960	5,960
Operating profits		138	172	215	269	336	420	524	656	656
Less taxes		–43	–53	–67	–84	–104	–130	–162	–203	–203
Less incremental investment in fixed capital		–38	–47	–59	–73	–92	–114	–143	–179	0
Less incremental working capital investment		–25	–31	–39	–49	–61	–76	–95	–119	0
Operating free cash flow		32	41	50	63	79	100	124	155	453
Discounted cash flows within planning horizon	$\frac{32}{1.16}+\frac{41}{(1.16)^2}+\frac{50}{(1.16)^3}+\frac{63}{(1.16)^4}+\frac{79}{(1.16)^5}+\frac{100}{(1.16)^6}+\frac{124}{(1.16)^7}+\frac{155}{(1.16)^8}=295$									
Discounted cash flow beyond planning horizon 453/0.16 = 2,831, then 2,831/$(1.16)^8$										= 864
Marketable securities										= 110
Corporate value										**1,269**

Shareholder value = Corporate value – Debt
= £1,269,000 – £200,000
= £1,069,000

Sensitivity and scenario analysis

(These comments apply to cash flow analysis as well.)

To make a more informed choice the directors may wish to carry out a sensitivity and scenario analysis (see Chapter 5 for an introduction to this technique). A worst-case and a best-case scenario could be constructed and the sensitivity to changes in certain variables could be scrutinized. For example, alternative discount rates and incremental investment in fixed capital rates could be examined for the multi-colored product strategy as shown in Table 8.7.

One observation that may be made from Table 8.7 is that even if the amount of incremental capital investment required rises to 20 percent of the increase in sales and the discount rate moves to 17 percent this strategy produces the highest value of all the four options considered. The management team may wish to consider the consequences and the likelihood of other variables changing from the original expected levels.

TABLE 8.7

Shareholder value for the guttering firm under different discount and capital investment rates

£000s		Discount rate		
		15%	**16%**	**17%**
Incremental fixed capital investment rates	15%	1,205	1,069	951
	20%	1,086	955	843

Targets, rewards and alignment of managerial effort

Following an initial shareholder value analysis it can be useful to breakdown each of the seven Rappaport value drivers into more detail. So, for example, if the operating profit margin is 20 percent you could investigate what proportion of the 80 percent of income from sales flows out in the form of wages, or material costs, or overheads, etc. This will permit focus of managerial attention. It also allows performance measures and targets to be more detailed. The production manager can be set targets in terms of raw material wastage and shop floor employee efficiency. These operating targets can then be fed into the goal to improve the operating margin and the ultimate goal of shareholder wealth maximization. Similarly, managers with responsibility for fixed and working capital investment can agree targets that are aligned with all the other managers in terms of being focussed on value.

Another use of this analytical method: The value drivers (and their component parts) can be used to benchmark the company against competitors. So, if you find that your firm has the highest level of work-in-progress inventory per unit of sales you may want to see if there are efficiency gains to be made.

Problems with shareholder value analysis

There are some disadvantages to the use of shareholder value analysis.

- Constant percentage increases in value drivers lack realism in some circumstances, in others it is a reasonable simplification.
- It can be misused in target setting, for example if managers are given a specific cash flow objective for a 12-month period they may be dissuaded from necessary value-enhancing investment (i.e. using cash) to achieve the short-term cash flow target. Alleviate this problem by setting both short- and long-term targets. The short-term ones may show negative cash flows.
- Data availability – many firms' accounting systems are not equipped to provide the necessary input data. The installation of a new cash flow orientated system may be costly.

Economic profit

Economic profit, EP (also called residual income) has an advantage over shareholder value analysis because it uses the existing accounting and reporting systems of firms by focussing on profit rather than cash flow information. This not only reduces the need to implement an overhaul of the data collecting and reporting procedures but also provides evaluatory and performance measurement tools which use the familiar concept of profit. Managers used to 'bottom line' figures are more likely to understand and accept this metric than one based on cash flow information.

Economic profit for a period is the amount earned by a business after deducting all operating expenses and a charge for the opportunity cost of the capital[3] employed.

A business only produces an economic profit if it generates a return greater than that demanded by the finance providers given the risk class of investment. There are two versions of economic profit.

The entity approach to EP

One version of EP is based on profit after tax is deducted but before interest is deducted.[4] There are two ways to calculate this EP.

The profit less capital charge method

Here a charge for the use of capital equal to the invested capital multiplied by the return required by the share and debt holders (which is a weighted average cost of the debt and the equity, WACC) is deducted from the operating profits after tax:

Economic profit (entity approach)	=	Operating profit before interest deduction and after tax deduction	–	Capital charge

Economic profit (entity approach)	=	Operating profit before interest deduction and after tax deduction	–	Invested capital × WACC

The 'performance spread' method

The difference between the return achieved on invested capital and the weighted average cost of capital (WACC), i.e. the required rate of return, is the performance spread. This percentage figure is then multiplied by the quantity of invested capital to obtain EP:

Economic profit (entity approach)	=	Performance spread	×	Invested capital

Economic profit (entity approach)	=	Return on capital – WACC	×	Invested capital

The WACC allows for an appropriate risk-adjusted return to each type of finance provider (debt and equity) – see Chapter 10 for a calculation of this. As can be seen from the following Illustration either method leads to the same EP.

Illustration

EoPs plc has a weighted average cost of capital (required rate of return) of 12% and has used £1m of invested capital (share and debt) to produce an operating profit before interest and after tax of £180,000 during the past year.

Profit less capital charge:

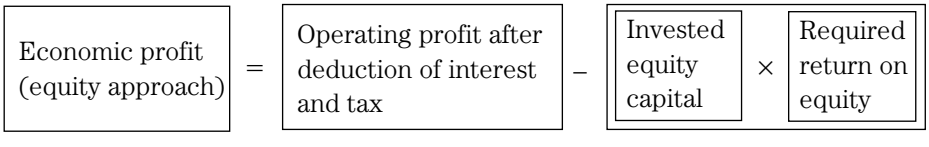
EP = Operating profits before interest and after tax – (Invested capital × WACC)
= £180,000 – (£1,000,000 × 0.12)
= £60,000

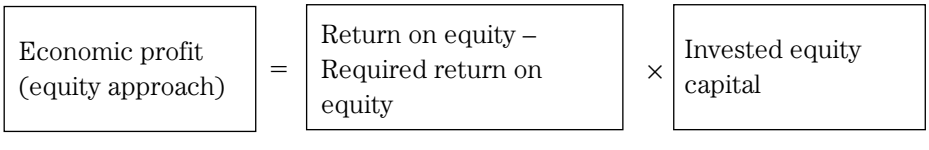
Performance spread approach:

EP = (Return on capital – WACC) × Invested capital
= (18% – 12%) × £1,000,000
= £60,000

The equity approach to EP

This entity EP approach, based on operating profit before the deduction of interest, calculates the surplus above the return to all the finance providers to the business entity including the debt holders. The alternative is the 'equity approach'. With this interest is deducted from the profit figure so we obtain the profit that belongs to the shareholders. Also the required return is the return demanded on the equity capital only. So, EP is the profit attributable to shareholders' after a deduction for the implicit cost of employing shareholders' capital.





Illustration

In the case of EoPs let us assume that one-half the £1m of capital is equity and the other half debt. The equity required rate of return is 15% and the debt required rate of return is 9% (i.e. £45,000 per year), therefore the weighted average cost of capital is 12%.

Profit less capital charge:
Deducting £45,000 of interest from the operating profit figure we have £135,000.

$$\begin{aligned}\text{EP (equity)} &= \text{Operating profits after interest and tax} - (\text{Invested equity capital} \times \text{Required return on equity})\\ &= £135{,}000 - (£500{,}000 \times 0.15)\\ &= £60{,}000\end{aligned}$$

Performance spread approach:

$$\begin{aligned}\text{EP (equity)} &= (\text{Return on equity} - \text{Required return on equity}) \times \text{Invested equity capital}\\ &= (27\% - 15\%) \times £500{,}000\\ &= £60{,}000\end{aligned}$$

The return on equity[5] is 27% (£135,000/£500,000).

A short history of economic profit

The principles behind economic profit have a long antecedence. For at least a century economists have been aware of the need to recognize the minimum return to be provided to the finance provider as a 'cost' of operating a business. Enlightened chief executives have for decades, if not centuries, taken account of the amount of capital used by divisional managers when setting targets and measuring performance, with some sort of implicit, or explicit, cost being applied. David Solomons (1965) formalized the switch from return on capital employed (ROCE) and other accounting rates of return measures to 'the excess of net earnings over the cost of capital as the measure of managerial success'. But even he drew on practical innovation that had taken place in a number of large US companies.

The use of economic profit is becoming more widespread

For over a decade major US firms, including Walt Disney, Quaker Oats and AT&T, have been switching to using economic profit as a guiding concept. The focus of economic profit on the productive use of capital can have profound consequences. Roberto Goizueta, CEO of Coca-Cola, put the basic philosophy this way: 'We raise capital to make concentrate, and sell it at an operating profit. Then we pay the cost of that capital. Shareholders pocket the difference'.* Barclays Bank adopted the technique in 2000 declaring their aim to double economic profit every four years.† Bass stated that 'any acquisition must clear three hurdles: create value in net present value terms; enhance earnings in year one; and produce returns above the weighted average cost of capital by year three'.**

Sources:*Quoted in Tully (1993), p. 93. † *The Economist*, London, 18 November 2000.
** *Financial Times*, 8 December 2000.

Usefulness of economic profit

A focus on EP rather than the traditional accounting profit has the advantage that every manager down the line is encouraged (rewarded) for paying close attention to the cost associated with using capital in a business unit, project, product line or the entire corporation. The introduction of EP targets has resulted in some dramatic reductions in money tied-up wastefully in assets such as raw material stocks, and to significant reductions in requests for major fixed capital expenditure. Managers who are judged on profits may not be as keen to reduce capital employed as those judged on EP.

Economic profit can be used to evaluate strategic options which produce returns over a number of years. For example, Spoe plc is considering the investment of £2m in a new division that is expected to produce a constant operating profit after tax of £300,000 per year to infinity without the need for any further investment in fixed capital or working capital in subsequent years. The company has a required rate of return on capital of 13 percent. The extra value created on top of the initial investment of £2m is:

$$\begin{aligned}\text{Economic profit (entity) per year} &= (\text{Return on capital} - \text{WACC}) \times \text{Invested capital} \\ &= (15\% - 13\%) \times £2{,}000{,}000 \\ &= £40{,}000\end{aligned}$$

The present value of this perpetuity is:

£40,000/0.13 = £307,692

This £307,692 is the additional value, in present terms, of operational cash flow. To obtain the total value of this division we add to this the initial investment:

$$\begin{aligned}\text{Value of new division} &= \text{Present value of economic profit} + \text{Initial investment} \\ &= £307{,}692 + £2{,}000{,}000 = £2{,}307{,}692\end{aligned}$$

Having expressed the new strategy in terms of EP, in implementing it EP targets can be set annually and rewards granted for achieving (exceeding) those targets.

Economic profit has an advantage over shareholder value analysis in that it can be used to look back at how the firm (unit) has performed relative to the amount of capital used each year as well as creating future targets in terms of EP. (Shareholder value analysis is generally used only in forward-looking mode. Having said that however, once the shareholder value analysis estimates have been made for a strategy it is possible to set interim targets, which, as time passes, are examined for deviation. So, in this sense it can be used in backward looking mode, i.e. within a plan.) With EP it is possible to go to a firm and examine past performance from scratch, without the need for established EP targets within a plan.

Economic profit per unit can be calculated. For example, economic profit per square foot or economic profit per unit of output. Economic profit sends a more powerful signal because it is expressed in absolute amounts of money generated for shareholders above the minimum required, e.g. £1.20 EP per unit sold, rather than a percentage, e.g. profit margin of 14 percent. Profit margins fail to allow for the size of the capital commitment.

Difficulties with economic profit

There are, however, some disadvantages to the use of economic profit.

The balance sheet does not reflect invested capital

Balance sheets are not designed to provide information on the present economic value of assets being used in a business. Assets are generally recorded at original cost less depreciation, amortization (reduction in intangibles) and depletion (e.g reduction in oil reserves). With or without inflation it does not take many years for these balance sheet values to deviate dramatically from the theoretically correct capital employed figures for most firms. Generally balance sheets significantly understate the amount of capital employed, and this understatement causes EP to appear high. Moreover, many businesses invest in assets that never find their way to a balance sheet. For example, some firms pour vast sums into building up brand images and do so with the, often correct, belief that shareholders' money is being well invested, with the pay-off arising years later. Nevertheless, accounting convention insists on such expenditures being written off against profits rather than being taken into the balance sheet. The same problem applies to other 'investments' such as business reputation and management training. The early theorists in value measurement suggested using current values of assets. Following them I would be tempted in certain circumstances to use the either (a) the sum of the resale value of individual assets, or (b) replacement cost. Much depends on the objective of the analysis:

- If the objective is to monitor past performance in terms of examining the efficiency with which money was invested the historic amount invested seems somewhat relevant as the 'capital' figure. However, there will be many circumstances where a distinctly unsatisfactory capital figure is derived from a balance sheet, e.g. when assets were acquired decades before the current period.
- If you are monitoring current (this year) performance perhaps the current replacement value or the sum of the resale value of individual assets may be most useful. (Sometimes the resale value is very low when the assets are highly specific with little secondary market, so relying on the resale value alone would give an artificially low asset value. In other circumstances the replacement value is clearly way above the level that any manager would actually replace at and so a more informed decision can be made by using resale value as it represents the opportunity cost of using the assets this year.)
- If the asset value is needed to make future oriented decisions about where to invest assets presently owned by the firm then the sum of the resale value of the individual assets would be most useful because this would capture the opportunity cost – the firm could sell off these assets as an alternative. The sunk costs associated with past investment are not relevant in such a decision and so balance sheet values are not very useful.
- If the decision concerns the obtaining of new assets to implement a project/strategy then the cost of obtaining them is relevant.

Note that we use the 'sum of the resale value of individual assets' rather than the current market value of all-the-assets-when-welded-together-as-a-coherent-whole for the corporation/SBU because to use the latter would eliminate any value by definition. For example, if a firm starts up with £1m of capital and a brilliant idea, immediately the strategy is put in place to exploit the idea the resale value of the firm as an operating entity rises to, say, £10m. That is, the resale value of the firm is equal to the initial capital plus the present value of the future cash flows or EP. The £10m current market value of all-the-assets-when-welded-together-as-a-coherent-whole includes £9m of value, but the value of the sum of the individual assets is in the region of £1m.

Manipulation and arbitrariness

The difficulties caused by relying on accounting data are exacerbated by the freedom available to manipulate such figures as well as the degree of subjectivity involved in arriving at some of the figures in the first place. For example, if a business has sold goods on credit some customers are likely to fail to pay on the due date. The problem for the accountant (and managers) is to decide when to accept that particular debts will never be paid; is it after three months, six months or a year? Until they are declared 'bad debts' they are recorded as an asset – perhaps they will turn out to be worth something, perhaps they won't. At each balance sheet date judgment is required to establish an estimate of the value of the debtor balance to the firm. Similar problems of 'flexibility' and

potential for manipulation are possible with the estimate of the length of life of an asset (which has an effect on annual depreciation), and with R&D expenditure or inventory valuation.

Having a wide range of choice of treatment of key inputs to the profit and loss account and balance sheets makes comparability over time, and between companies, very difficult.

High economic profit and negative NPV can go together

There is a danger of over-reliance on EP. For example, imagine a firm has become a convert to economic profit and divisional managers are judged on annual economic profit. Their bonuses and promotion prospects rest on good performance spreads over the next 12 months. This may prompt a manager to accept a project with an impressive EP over the short term whether or not it has a positive NPV over its entire life. Projects that produce poor or negative EPs in the first few years, for example biotechnology investments, will be rejected even if they will enhance shareholder wealth in the long term.

Also, during the life of a project, managers may be given specific EP targets for a particular year. They may be tempted to ensure the profit target is met by cutting down on certain expenditures such as training, marketing and maintenance. The target will be achieved but long-term damage may be inflicted.

A third value-destroying use of EP occurs when managers are demotivated by being set EP targets. For example, if managers have no control over the capital employed in their part of the business, they may become resentful and cynical of value-based management if they are told nevertheless to achieve certain EP targets.

Care must be taken by external observers when examining the EP (or EVA) to judge performance, particularly in annual league tables. Misleading impressions are frequent over periods as short as one year because some firms that are on a high value creating path often have years where EP is low (or nil). Then there are firms on a value destructive path which report high current year EP. You can only judge performance over a number of years. When EP is used internally, however, it frequently does make sense to produce annual (or even six-monthly) EP figures to compare with a plan to see if the value creation strategy is on target. Within the plan there will probably be periods of negative EP (e.g. in the start-up phase), as well as periods of high surpluses over the cost of capital.

Difficult to allocate revenues, costs and capital to business units, products, etc.

To carry out EP analysis at the sub-firm level it is necessary to measure profit and capital invested separately for each area of the business. Many costs and capital assets are shared between business units, product lines and customers. It is very difficult in some situations to identify the proportion of the cost, debt or asset that is attributable to each activity. It can also be expensive. Consultants tend to be overoptimistic about the ability of accountants and managers to do this in a theory-compliant and precise manner.

Economic value added (EVA®)

EVA, developed and trademarked by the US consultants Stern Stewart and Co., is a variant of EP that attempts to overcome some of the problems outlined above. Great energy has been put into its marketing and it is probably the most widely talked about value metric.

EVA = Adjusted invested capital × (Adjusted return on capital – WACC)

or

EVA = Adjusted operating profits after tax – (Adjusted invested capital × WACC)

The adjustments to profit and capital figures are meant to refine the basic EP. Stern Stewart suggest that up to 164 adjustments to the accounting data may be needed. For example, spending on marketing and R&D helps build value and so these are added back to the balance sheet as assets (and amortized over the period expected to benefit from these expenditures). Goodwill on acquisitions previously written off is also returned and is expressed as an asset, thus boosting both profits and the balance sheet.

There are a number of difficulties with these adjustments – for example, over what period should these reconstituted 'assets' be amortized? Should you make adjustments for events up to five years ago, ten years ago, or the whole life of the firm?

EVA, like the generic EP, has the virtue of being based on familiar accounting concepts and it is arguably more accurate than taking ordinary accounting figures. However, critics have pointed out that the adjustments can be time-consuming and costly, and many are based on decisions that are as subjective as the original accountant's numbers. There also remains the problem of poorly, if enthusiastically, implemented EVA reward systems producing results that satisfy targets for EVA but which produce poor decisions with regard to NPV. Furthermore, the problem of allocating revenue, costs and capital to particular business units and products is not solved through the use of EVA.

Despite the outstanding problems companies are seeing benefits from introducing EVA.

> It's not rocket science, but it is good lingua franca that does indeed get everyone back to basics, makes them understand better the cash consequences of their own actions and, further, makes them address other departments' problems, not just their own. Within each of our businesses we don't incentivise, for example, the sales director on sales and we don't incentivise the finance director on cash generation. The whole management team is incentivised on EVA and that means they are all pulling in the same direction and have to liaise better. (Mike Ashton, Finance Director of BWI).[6]

At Burtons, the UK clothing retailer (now Arcadia), Martin Clifford-King said:

> We see it [EVA] as an operational tool. In the past, stores used to be targeted on sales, then we moved to profit, and EVA is a further refinement of this approach, taking into account the cost of capital tied up in the business.[7]

The use of EVA is spreading around the world. Sony, in Japan, has invited Stern Stewart to work with the company. In Germany Volkswagen has attempted to align managerial interests with those of shareholders by making up to 40 percent of their annual bonuses dependent on achieving EVA targets – *see* Exhibit 8.1 (excuse the mistake in the article on the meaning of 'E').

VW to alter management focus

By James Mackintosh, **Motor Industry Editor, in Wolfsburg**

Volkswagen, Europe's largest manufacturer of motor vehicles, is shaking up executive pay in an attempt to make managers more cautious about investment and increase loyalty to the group rather than the seven individual brands.

VW will base up to 40 per cent of this year's bonus on returns above the cost of capital, a big step in an industry renowned for destroying capital.

The move to earnings value added (EVA) measures to determine pay is part of an attempt by Bernd Pischetsrieder, chief executive, and Hans Dieter Pötsch, incoming finance director, to make managers think harder before making investments.

The group has abandoned return on sales targets in favour of measuring return on invested capital and is clamping down on investment and research and development spending, seen as out of control. …

In addition to EVA, the bonus structure adds group performance measures to the individual and brand measures already used in an attempt to make the brands work with each other, rather than competing. …

Last year VW made a return on invested capital of 7.4 per cent, below its 7.7 per cent cost on capital – equivalent to destroying €134m ($164m) of value. It paid an average bonus of €1.31m last year to the nine managers and board members.

To start with directors will have only 40 per cent of bonuses determined by EVA measures, a similar level to more junior managers. Base salary is unaffected. But Mr. Pötsch said: 'Eventually a substantal part of payments will be based on EVA.'

Investment was already expected to fall, with more than €3bn cut from capital spending, 10 per cent of the 2002 five-year plan. Mr Pötsch said 'a similar amount' could be saved from the R&D budget.

EXHIBIT 8.1 VW to alter management focus

Source: *Financial Times* 1 September 2003

Cash flow return on investment (CFROI)

The CFROI approach is a more complicated version of the internal rate of return (IRR) method employed in Chapter 2. There it was used for investment projects, CFROI expands the principle to a larger scale, even to the entire firm. To calculate the CFROI for a strategic business unit you would need to obtain the amount of capital (including debt) currently devoted to it and then estimate the operating cash flows. After a few complicating adjustments you calculate the rate of return that causes cash outflows (including initial capital value) to equal cash inflows to arrive at the CFROI.

The promoters of this approach recommend that assets in the balance sheet be restated to their current price equivalent value to achieve a proper estimate of the sacrifice finance providers to the company are making in the SBU (or product line, or entire company). For example, accumulated depreciation is added back to the balance sheet value for fixed assets. Inventory values and fixed asset values may be raised by the amount of inflation since purchase to be at 'current prices'. Goodwill from acquired companies previously written off is added back. The value of future lease obligations are also added back.

CFROI suffers from the same problems of IRR such as the tendency to favour projects with a high percentage gain over those with a high absolute gain in shareholder wealth – see Chapter 2.

There is a degree of imprecision and arbitratriness in adding back depreciation and making an inflation adjustment, e.g. are the assets the firm is using five or 20 years old?

It is also a relatively complicated method to use, particularly in circumstances where assets and costs are shared between SBUs, projects or product lines.

Conclusion

This chapter has described a number of value-based metrics used to guide organizations. This is field dominated by consultancy organizations each with a particular approach to sell. The foundation for all of them is discounted cash flow allowing for a suitable return on the money shareholders contribute to the business. I suggest that, rather than selecting one internal value metric, a better approach, for both strategic investment discussion and performance targeting and measurement, is to set both cash flow and economic profit targets. This would counter a number of problems of using each separately and would help to alleviate the tendency of managers to take action to achieve particular short-term targets at the expense of long-term wealth.

Notes

1 Discussed in Chapter 6.
2 Operating profit margin on sales is sales revenue *less* cost of sales and all selling and administrative expenses before deduction of tax and interest.
3 The meaning of the word 'capital' used here is different from its meaning in accounting. 'Capital' in accounting is a part of the shareholders' equity of the company ('capital issued', 'paid-in capital', etc.). 'Capital' in the present context means the sum of shareholders' equity (and of the borrowings of the company in the first version of EP).
4 There are a few technical complications ignored here, but this is the essence of EP. For more detail consult McTaggart *et al.* (1994) or Stewart (1991).
5 The entity EP and the equity EP give the same annual EP figures but can give different equity values if calculated with a WACC determined by the initial proportions of debt and equity (i.e. those amounts put into the business by shareholders and debt holders). This is apparent in the following illustration (to be read after absorbing the fundamentals of WACC in Chapter 10). Valucrazee plc is set up with £50m from shareholders and £50m of debt capital. Equity at this risk level requires a rate of return of 20 percent, while debt requires 10 percent, therefore the WACC (based on initial proportions of debt and equity) = 15 percent. The company is expected to produce cash flow available for all the finance providers (i.e. before deduction of interest but after tax) of £25m per year to infinity.

   Value under the entity approach:

   Annual EP = Profit after tax before interest – Capital × Required rate of return
   Annual EP = £25m – (£100m × 15%) = £10m

   Corporate value = Initial total capital + Present value of annual economic profit
   Corporate value = £100m + £10m/0.15 = £166.67m

   Equity value = Corporate value – debt value = £166.67m – £50m = £116.67m

   Value under the equity approach:

   Annual EP = Profit after tax and interest – Equity capital × Required rate of return
   Annual EP = (£25m – £5m) – (£50m × 20%) = £10m

   Equity value = Initial equity + Present value of annual equity economic profit
   Equity value = £50m + £10m/0.20 = £100m

   The reason for the £16.67m difference is that the surplus cash flow above the minimum required is discounted at different rates. In the first case the £10m surplus cash flow (which must all be attributable to shareholders as the debt holders are satisfied with the 'required rate of return' deduction) is discounted at 15 percent, whereas in the second case it is discounted at 20 percent.

   To make the two equity values equal we need to follow the rule when calculating WACC of using market value weights for debt and equity (i.e. what the total value of the shares in the company are after going ahead) rather than original book (balance sheet) values. The market value of debt remains the same if a value-enhancing project is accepted – that is, £50m. However, the market value of the equity is significantly higher than the amount first put in by the shareholders.

The annual cash flow to equity of £20m when discounted at 20 percent is £100m. Therefore, the weights used to calculate the WACC are:

Debt	£50m	Weight: £50m/£150m = 0.333
Equity	£100m	Weight: £100m/£150m = 0.667
Total capital	£150m	

$$\text{WACC} = K_e W_E + K_D W_D = 0.2 \times 0.667 + 0.1 \times 0.333 = 16.67\%$$

This changes the valuation under the entity approach:

Annual EP = Profit after tax before interest – Capital × Required rate of return
Annual EP = £25m – (£100m × 16.67%) = £8.33m

Corporate value = Initial total capital + Present value of annual economic profit
Corporate value = £100m + £8.33m/0.1667 = £150m

Equity value = Corporate value – debt value = £150m – £50m = £100m (the same as under the equity approach)

Under the WACC-adjusted-for-market-value-of-equity approach we observe a fall in the annual EP when using the entity approach from £10m to £8.33m because we, correctly, require 20 percent return on two-thirds (£100m) of capital employed out of a total of £150m (at market values).

What is the practical manager to do? In theory you should be using the market value proportions of debt and equity that are optimal for your firm for all projects, SBUs and for valuing the entire firm. That is, the firm should have target levels of debt relative to the equity base that produces the lowest WACC (see Chapter 10).

The reality in most firms is that the optimum mix of debt and equity is unlikely to be known with any precision as the factors determining the optimum are, at base, can only be quantified through subjective probability estimates, e.g. the chance of financial distress (see Chapter 18). So, it is reasonable to think of the optimum proportions of debt and equity as a range rather than a pin-point percentage. For most firms the reasonable range is quite large. It could easily run from 50:50 gearing to 33:66 gearing. The advice to think in terms of a range for the WACC is reinforced by the many difficulties in other inputs to the WACC calculation, from the cost of equity (what is the risk premium? Is beta the appropriate adjustment for risk?) to the risk free rate of return – see Chapter 10.

Given the complications with the WACC under the entity approach many analysts would simply plump for the equity approach in the first place.

6 Quoted in *Management Today*, January 1997, p. 45.
7 *Ibid.*