

Business valuations

17

Business valuations

Topic list	Syllabus reference
1 The nature and purpose of business valuations	G1 (a), (b)
2 Asset valuation bases	G2 (a)
3 Income based valuation bases	G2 (b)
4 Cash flow based valuation models	G2 (c)
5 The valuation of debt	G3 (a)

Introduction

In Part G we shall be concentrating on the valuation of businesses. In this chapter, we shall cover the **reasons** why businesses are valued and the main **methods of valuation**.

Study guide

		Intellectual level
G1	Nature and purpose of the valuation of business and financial assets	
(a)	Identify and discuss reasons for valuing businesses and financial assets	2
(b)	Identify information requirements for valuation and discuss the limitations of different types of information.	2
G2	Models for the valuation of shares	
(a)	Asset-based valuation models, including:	2
(i)	Net book value (balance sheet basis).	
(ii)	Net realisable value basis.	
(iii)	Net replacement cost basis.	
(b)	Income-based valuation models, including:	2
(i)	Price/earnings ratio method.	
(ii)	Earnings yield method.	
(c)	Cash flow-based valuation models, including:	2
(i)	Dividend valuation model and the dividend growth model.	
(ii)	Discounted cash flow basis.	
G3	The valuation of debt and other financial assets	
(a)	Apply appropriate valuation methods to:	2
(i)	Irredeemable debt	
(ii)	Redeemable debt	
(iii)	Convertible debt	
(iv)	Preference shares	

Exam guide

Business valuations are highly examinable. You might be asked to apply different valuation methods and discuss their advantages and disadvantages.

1 The nature and purpose of business valuations

FAST FORWARD

There are a number of different ways of **putting a value on a business**, or on shares in an unquoted company. It makes sense to use **several methods** of valuation, and to compare the values they produce.

1.1 When valuations are required

Given quoted share prices on the Stock Exchange, why devise techniques for estimating the value of a share? A share valuation will be necessary:

- (a) For **quoted companies**, when there is a takeover bid and the offer price is an estimated 'fair value' in excess of the current market price of the shares.

Key term

A **takeover** is the acquisition by a company of a controlling interest in the voting share capital of another company, usually achieved by the purchase of a majority of the voting shares.

- (b) For **unquoted companies**, when:
 - (i) The company wishes to 'go public' and must fix an issue price for its shares
 - (ii) There is a scheme of merger
 - (iii) Shares are sold
 - (iv) Shares need to be valued for the purposes of taxation
 - (v) Shares are pledged as collateral for a loan
- (c) For **subsidiary companies**, when the group's holding company is negotiating the sale of the subsidiary to a management buyout team or to an external buyer.
- (d) For **any company**, where a shareholder wishes to dispose of his or her holding. Some of the valuation methods we describe will be most appropriate if a large or controlling interest is being sold. However even a small shareholding may be a significant disposal, if the purchasers can increase their holding to a controlling interest as a result of the acquisition.
- (e) For **any company**, when the company is being broken up in a liquidation situation or the company needs to obtain additional finance, or re-finance current debt.

1.2 Information requirements for valuation

There is a wide range of information that will be needed in order to value a business.

- Financial statements: Statements of financial position, income statements, statements of changes in financial position and statements of shareholders equity for the past five years
- Summary of non-current assets list and depreciation schedule
- Aged accounts receivable summary
- Aged accounts payable summary
- List of marketable securities
- Inventory summary
- Details of any existing contracts eg leases, supplier agreements
- List of shareholders with number of shares owned by each
- Budgets or projections, for a minimum of five years
- Information about the company's industry and economic environment
- List of major customers by sales
- Organisation chart and management roles and responsibilities

This list is not exhaustive and there are **limitations** of some of the information. For example, statement of financial position values of assets may be out of date and unrealistic, projections may be unduly optimistic or pessimistic and much of the information used in business valuation is **subjective**. We will look at this in more detail under each valuation method.

Exam focus point

In an exam question as well as in practice, it is unlikely that one method would be used in isolation. Several valuations might be made, each using a different technique or different assumptions. The valuations could then be compared, and a final price reached as a compromise between the different values. Remember that some methods may be more appropriate for valuing a small parcel of shares, others for valuing a whole company.

1.3 Market capitalisation

6/08

Key term

Market capitalisation is the market value of a company's shares multiplied by the number of issued shares.

Exam focus point

In June 2008, the examiner used the term 'market capitalisation' to ask for a calculation of the value of a company. Some students were confused by this terminology.

2 Asset valuation bases

FAST FORWARD

The **net assets valuation** method can be used as one of many valuation methods, or to provide a lower limit for the value of a company. By itself it is unlikely to produce the most realistic value.

2.1 The net assets method of share valuation

Using this method of valuation, the value of a share in a particular class is equal to the **net tangible assets** divided by the **number of shares**. **Intangible assets** (including goodwill) should be excluded, unless they have a market value (for example patents and copyrights, which could be sold).

- (a) **Goodwill**, if shown in the accounts, is unlikely to be shown at a true figure for purposes of valuation, and the value of goodwill should be reflected in another method of valuation (for example the earnings basis)
- (b) **Development expenditure**, if shown in the accounts, would also have a value which is related to future profits rather than to the worth of the company's physical assets.

2.2 Example: net assets method of share valuation

The summary statement of financial position of Cactus is as follows.

<i>Non-current assets</i>	\$	\$	\$
Land and buildings			160,000
Plant and machinery			80,000
Motor vehicles			<u>20,000</u>
			260,000
Goodwill			20,000
<i>Current assets</i>			
Inventory		80,000	
Receivables		60,000	
Short-term investments		15,000	
Cash		<u>5,000</u>	
		160,000	
<i>Current liabilities</i>			
Payables	60,000		
Taxation	20,000		
Proposed ordinary dividend	<u>20,000</u>		
		(100,000)	
			<u>60,000</u>
			340,000
12% bonds			(60,000)
Deferred taxation			<u>(10,000)</u>
			<u>270,000</u>
Ordinary shares of \$1			80,000
Reserves			<u>140,000</u>
			220,000
4.9% preference shares of \$1			<u>50,000</u>
			<u>270,000</u>

What is the value of an ordinary share using the net assets basis of valuation?

Solution

If the figures given for asset values are not questioned, the valuation would be as follows.

	\$	\$
Total value of assets less current liabilities		340,000
Less intangible asset (goodwill)		<u>20,000</u>
Total value of assets less current liabilities		320,000
Less: Preference shares	50,000	
Bonds	60,000	
Deferred taxation	<u>10,000</u>	
		<u>120,000</u>
Net asset value of equity		<u>200,000</u>
Number of ordinary shares		80,000
Value per share		\$2.50

2.3 Choice of valuation bases

The difficulty in an asset valuation method is establishing the **asset values** to use. Values ought to be realistic. The figure attached to an individual asset may vary considerably depending on whether it is valued on a **going concern** or a **break-up** basis.

Possibilities include:

- **Historic basis** – unlikely to give a realistic value as it is dependent upon the business's depreciation and amortisation policy
- **Replacement basis** – if the assets are to be used on an on-going basis
- **Realisable basis** – if the assets are to be sold, or the business as a whole broken up. This won't be relevant if a minority shareholder is selling his stake, as the assets will continue in the business's use

The following list should give you some idea of the factors that must be considered.

- (a) Do the assets need **professional valuation**? If so, how much will this cost?
- (b) Have the **liabilities** been accurately quantified, for example deferred taxation? Are there any contingent liabilities? Will any balancing tax charges arise on disposal?
- (c) How have the **current assets** been valued? Are all receivables collectable? Is all inventory realisable? Can all the assets be physically located and brought into a saleable condition? This may be difficult in certain circumstances where the assets are situated abroad.
- (d) Can any **hidden liabilities** be accurately assessed? Would there be redundancy payments and closure costs?
- (e) Is there an **available market** in which the assets can be realised (on a break-up basis)? If so, do the statement of financial position values truly reflect these break-up values?
- (f) Are there any **prior charges** on the assets?
- (g) Does the business have a regular **revaluation and replacement** policy? What are the bases of the valuation? As a broad rule, valuations will be more useful the better they estimate the **future cash flows** that are derived from the asset.
- (h) Are there factors that might indicate that the **going concern valuation** of the business **as a whole** is **significantly higher** than the valuation of the individual assets?
- (i) What shareholdings are being sold? If a minority interest is being disposed of, realisable value is of limited relevance as the assets will not be sold.

2.4 Use of net asset basis

The net assets basis of valuation might be used in the following circumstances.

- (a) **As a measure of the 'security' in a share value.** A share might be valued using an earnings basis. This valuation might be **higher or lower than the net asset value per share**. If the earnings basis

is higher, then if the company went into liquidation, the investor could not expect to receive the full value of his shares when the underlying assets were realised.

The **asset backing** for shares thus provides a measure of the **possible loss** if the company fails to make the expected earnings or dividend payments. Valuable tangible assets may be a good reason for acquiring a company, especially freehold property which might be expected to increase in value over time.

(b) **As a measure of comparison in a scheme of merger**

Key term

A **merger** is essentially a business combination of two or more companies, of which none obtains control over any other.

For example, if company A, which has a low asset backing, is planning a merger with company B, which has a high asset backing, the shareholders of B might consider that their shares' value ought to reflect this. It might therefore be agreed that a something should be added to the value of the company B shares to allow for this difference in asset backing.

(c) As a **'floor value'** for a business that is up for sale – shareholders will be reluctant to sell for less than the NAV. However, if the sale is essential for cash flow purposes or to realign with corporate strategy, even the asset value may not be realised.

For these reasons, it is always advisable to calculate the net assets per share.

3 Income based valuation bases

FAST FORWARD

P/E ratios are used when a large block of shares, or a whole business, is being valued. This method can be problematic when quoted companies' P/E ratios are used to value unquoted companies.

3.1 The P/E ratio (earnings) method of valuation

12/07, 6/08, 12/08

This is a common method of valuing a **controlling interest** in a company, where the owner can decide on **dividend** and **retentions policy**. The P/E ratio relates earnings per share to a share's value.

$$\text{Since P/E ratio} = \frac{\text{Market value}}{\text{EPS}},$$

then market value per share = EPS × P/E ratio

Exam focus point

$$\text{Remember that earnings per share (EPS)} = \frac{\text{Profit /loss attributable to ordinary shareholders}}{\text{Weighted average number of ordinary shares}}$$

Examiners have commented in the past that students often calculate earnings per share incorrectly.

The P/E ratio produces an **earnings-based** valuation of shares by deciding a suitable P/E ratio and multiplying this by the EPS for the shares which are being valued.

Market valuation or capitalisation = P/E ratio × Earnings per share or P/E ratio × Total earnings

The EPS could be a historical EPS or a prospective future EPS. For a given EPS figure, a higher P/E ratio will result in a higher price.

3.2 Significance of high P/E ratio

A high P/E ratio may indicate:

(a) **Expectations that the EPS will grow rapidly**

A **high price is being paid for future profit prospects**. Many small but successful and fast-growing companies are valued on the stock market on a high P/E ratio. Some stocks (for example those of

some internet companies in the late 1990s) have reached high valuations before making any profits at all, on the strength of expected future earnings.

(b) **Security of earnings**

A well-established low-risk company would be valued on a higher P/E ratio than a similar company whose earnings are subject to greater uncertainty.

(c) **Status**

If a quoted company (the bidder) made a share-for-share takeover bid for an unquoted company (the target), it would normally expect its own shares to be valued on a higher P/E ratio than the target company's shares. This is because a quoted company ought to be a lower-risk company; but in addition, there is an advantage in having shares which are quoted on a stock market: the shares can be readily sold. The P/E ratio of an unquoted company's shares might be around 50% to 60% of the P/E ratio of a similar public company with a full Stock Exchange listing.

3.3 Problems with using P/E ratios

However using the P/E ratios of quoted companies to value unquoted companies may be problematic.

- Finding a quoted company with a **similar range of activities** may be difficult. Quoted companies are often **diversified**
- A **single year's P/E ratio** may not be a good basis, if earnings are volatile, or the quoted company's share price is at an abnormal level, due for example to the expectation of a takeover bid
- If a P/E ratio trend is used, then **historical data** will be being used to value how the unquoted company will do in the future
- The quoted company may have a **different capital structure** to the unquoted company

3.4 Guidelines for a P/E ratio-based valuation

When a company is thinking of acquiring an **unquoted** company in a takeover, the final offer price will be agreed by **negotiation**, but a list of some of the factors affecting the valuer's choice of P/E ratio is given below.

- (a) General **economic** and **financial** conditions.
- (b) The type of **industry** and the prospects of that industry. Use of current P/E ratios may give an unrealistically low valuation if these ratios are being affected by a lack of confidence throughout the industry.
- (c) The **size** of the undertaking and its **status** within its industry. If an unquoted company's earnings are growing annually and are currently around \$300,000 or so, then it could probably get a quote in its own right on the Alternative Investment Market, and a higher P/E ratio should therefore be used when valuing its shares.
- (d) **Marketability**. The market in shares which do not have a Stock Exchange quotation is always a restricted one and a higher yield is therefore required.

**Exam focus
point**

For examination purposes, you should normally **take a figure around one half to two thirds** of the industry average when valuing an unquoted company.

- (e) The **diversity** of shareholdings and the **financial status** of any principal shareholders.
- (f) The **reliability** of profit estimates and the past profit record. Use of profits and P/E ratios over time may give a more reliable valuation, especially if they are being compared with industry levels over that time.
- (g) **Asset backing** and **liquidity**.
- (h) The **nature of the assets**, for example whether some of the non-current assets are of a highly specialised nature, and so have only a small break-up value.
- (i) **Gearing**. A relatively high gearing ratio will generally mean greater financial risk for ordinary shareholders and call for a higher rate of return on equity.

- (j) The extent to which the business is dependent on the **technical skills** of one or more individuals.
- (k) The bidder may need to be particularly careful when valuing an unlisted company of using a P/E ratio of a '**similar**' listed company. The bidder should obtain reasonable evidence that the listed company does have the same risk and growth characteristics, and has similar policies on significant areas such as directors' remuneration.

3.4.1 Use of a bidder's P/E ratio

A bidder company may sometimes use their higher P/E ratio to value a target company. This assumes that the bidder **can improve the target's business**, which may be a dangerous assumption to make. It may be better to use an adjusted industry P/E ratio, or some other method.

3.4.2 Use of forecast earnings

When one company is thinking about taking over another, it should look at the target company's **forecast earnings**, not just its historical results.

Forecasts of **earnings growth** should only be used if:

- (a) There are good reasons to believe that earnings growth will be achieved.
- (b) A reasonable estimate of growth can be made.
- (c) Forecasts supplied by the target company's directors are made in good faith and using reasonable assumptions and fair accounting policies.



Question

Valuations

Flycatcher wishes to make a takeover bid for the shares of an unquoted company, Mayfly. The earnings of Mayfly over the past five years have been as follows.

20X0	\$50,000	20X3	\$71,000
20X1	\$72,000	20X4	\$75,000
20X2	\$68,000		

The average P/E ratio of quoted companies in the industry in which Mayfly operates is 10. Quoted companies which are similar in many respects to Mayfly are:

- (a) Bumblebee, which has a P/E ratio of 15, but is a company with very good growth prospects
- (b) Wasp, which has had a poor profit record for several years, and has a P/E ratio of 7

What would be a suitable range of valuations for the shares of Mayfly?

Answer

- (a) **Earnings.** Average earnings over the last five years have been \$67,200, and over the last four years \$71,500. There might appear to be some growth prospects, but estimates of future earnings are uncertain.

A low estimate of earnings in 20X5 would be, perhaps, \$71,500.

A high estimate of earnings might be \$75,000 or more. This solution will use the most recent earnings figure of \$75,000 as the high estimate.

- (b) **P/E ratio.** A P/E ratio of 15 (Bumblebee's) would be much too high for Mayfly, because the growth of Mayfly earnings is not as certain, and Mayfly is an unquoted company.

On the other hand, Mayfly's expectations of earnings are probably better than those of Wasp. A suitable P/E ratio might be based on the industry's average, 10; but since Mayfly is an unquoted company and therefore more risky, a lower P/E ratio might be more appropriate: perhaps 60% to 70% of 10 = 6 or 7, or conceivably even as low as 50% of 10 = 5.

The valuation of Mayfly's shares might therefore range between:

high P/E ratio and high earnings: $7 \times \$75,000 = \$525,000$; and

low P/E ratio and low earnings: $5 \times \$71,500 = \$357,500$.

3.5 The earnings yield valuation method

Another income based valuation model is the earnings yield method.

$$\text{Earnings yield (EY)} = \frac{\text{EPS}}{\text{Market price per share}} \times 100\%$$

This method is effectively a variation on the P/E method (the EY being the reciprocal of the P/E ratio), using an appropriate earnings yield effectively as a discount rate to value the earnings:

$$\text{Market value} = \frac{\text{Earnings}}{\text{EY}}$$

Exactly the same guidelines apply to this method as for the P/E method. Note that where **high growth** is envisaged, **the EY will be low**, as current earnings will be low relative to a market price that has built in future earnings growth. A stable earnings yield may suggest a company with low risk characteristics.

We can incorporate earnings growth into this method in the same way as the growth model that we will discuss in Section 4.2.

$$\text{Market value} = \frac{\text{Earnings} \times (1 + g)}{(K_e - g)}$$

This formula is given on your formula sheet as $P_0 = \frac{D_0(1 + g)}{K_e - g}$.



Question

Value of a company

A company has the following results.

	20X1	20X2	20X3	20X4
	\$m	\$m	\$m	\$m
Profit after tax	6.0	6.2	6.3	6.3

The company's cost of capital is 12%.

Required

Calculate the value of the company based on the present value of expected earnings.

Answer

$$\text{Market value} = \frac{\text{Earnings} \times (1 + g)}{(K_e - g)}$$

$$\text{Earnings} = \$6.3\text{m}$$

$$K_e = 12\%$$

$$g = \sqrt[3]{\frac{6.3}{6.0}} - 1 = 0.0164 \text{ or } 1.64\%$$

$$\begin{aligned} \text{Market value} &= \frac{6.3 \times 1.0164}{0.12 - 0.0164} \\ &= \$61.81\text{m} \end{aligned}$$

4 Cash flow based valuation models

FAST FORWARD

Cash flow based valuation models include the **dividend valuation model**, the **dividend growth model** and the **discounted cash flow basis**.

4.1 The dividend valuation model

12/07, 6/08

The dividend valuation model is based on the theory that an equilibrium price for any share (or bond) on a stock market is:

- The **future expected stream of income** from the security
- **Discounted** at a suitable **cost of capital**

Equilibrium market price is thus a **present value** of a **future expected income stream**. The annual income stream for a share is the expected dividend every year in perpetuity.

The basic dividend-based formula for the market value of shares is expressed in the **dividend valuation model** as follows:

$$MV (\text{ex div}) = \frac{D}{1+} + \frac{D}{(1+k_e)^2} + \frac{D}{(1+k_e)^3} + \dots = \frac{D}{k_e}$$

where
MV = Ex dividend market value of the shares
D = Constant annual dividend
 k_e = Shareholders' required rate of return

4.2 The dividend growth model

12/08

Using the **dividend growth model** we have:

$$P_0 = \frac{D_0(1+g)}{(1+k_e)} + \frac{D_0(1+g)^2}{(1+k_e)^2} + \dots = \frac{D_0(1+g)}{(k_e-g)} = \frac{D_1}{k_e-g}$$

where
 D_0 = Current year's dividend
g = Growth rate in earnings and dividends
 $D_0(1+g)$ = Expected dividend in one year's time (D_1)
 k_e = Shareholders' required rate of return
 P_0 = Market value excluding any dividend currently payable



Question

DVM

Target paid a dividend of \$250,000 this year. The current return to shareholders of companies in the same industry as Target is 12%, although it is expected that an additional risk premium of 2% will be applicable to Target, being a smaller and unquoted company. Compute the expected valuation of Target, if:

- The current level of dividend is expected to continue into the foreseeable future, or
- The dividend is expected to grow at a rate of 4% pa into the foreseeable future
- The dividend is expected to grow at a 3% rate for three years and 2% afterwards.

Answer

$$k_e = 12\% + 2\% = 14\% (0.14) \quad D_0 = \$250,000 \quad g (\text{in (b)}) = 4\% \text{ or } 0.04$$

$$(a) \quad P_0 = \frac{d_0}{k_e} = \frac{\$250,000}{0.14} = \$1,785,714$$

$$(b) \quad P_0 = \frac{d_0(1+g)}{k_e-g} = \frac{\$250,000(1.04)}{0.14-0.04} = \$2,600,000$$

(c) Time	1	2	3	4 onwards
Dividend (\$'000)	258	266	274	279
Annuity to infinity ($1/k_e - g$)				8.333
Present value at Year 3				2,325
Discount factor @ 14%	0.877	0.769	0.675	0.675
	226	205	185	1,569
Total \$2,185,000				

4.3 Assumptions of dividend models

The dividend models are underpinned by a number of assumptions that you should bear in mind.

- Investors act **rationally** and **homogenously**. The model fails to take into account the **different expectations** of shareholders, nor how much they are motivated by dividends vs future capital appreciation on their shares.
- The D_0 figure used does **not vary significantly** from the **trend of dividends**. If D_0 does appear to be a rogue figure, it may be better to use an adjusted trend figure, calculated on the basis of the past few years' dividends.
- The **estimates** of future dividends and prices used, and also the cost of capital are **reasonable**. As with other methods, it may be difficult to make a confident estimate of the cost of capital. Dividend estimates may be made from historical trends that may not be a good guide for a future, or derived from uncertain forecasts about future earnings.
- Investors' attitudes to receiving different cash flows at different times can be modelled using **discounted cashflow arithmetic**.
- Directors use dividends to **signal** the strength of the company's position (however companies that pay zero dividends do not have zero share values).
- Dividends either show **no growth** or **constant growth**. If the growth rate is calculated using $g=bR$, then the model assumes that b and R are constant.
- Other influences** on share prices are **ignored**.
- The company's **earnings will increase** sufficiently to maintain dividend growth levels.
- The **discount rate** used exceeds the **dividend growth rate**.

4.4 Discounted cash flow basis of valuation

This method of share valuation may be appropriate when one company intends to buy the assets of another company and to make further investments in order to improve cash flows in the future.

4.4.1 Example: discounted future cash flows method of share valuation

Diversification wishes to make a bid for Tadpole. Tadpole makes after-tax profits of \$40,000 a year. Diversification believes that if further money is spent on additional investments, the after-tax cash flows (ignoring the purchase consideration) could be as follows.

Year	Cash flow (net of tax)
	\$
0	(100,000)
1	(80,000)
2	60,000
3	100,000
4	150,000
5	150,000

The after-tax cost of capital of Diversification is 15% and the company expects all its investments to pay back, in discounted terms, within five years. What is the maximum price that the company should be willing to pay for the shares of Tadpole?

Solution

The maximum price is one which would make the return from the total investment exactly 15% over five years, so that the NPV at 15% would be 0.

Year	Cash flows ignoring purchase consideration \$	Discount factor (from tables) 15%	Present value \$
0	(100,000)	1.000	(100,000)
1	(80,000)	0.870	(69,600)
2	60,000	0.756	45,360
3	100,000	0.658	65,800
4	150,000	0.572	85,800
5	150,000	0.497	74,550
Maximum purchase price			<u>101,910</u>

4.4.2 Selection of an appropriate cost of capital

In the above example, Diversification used its own cost of capital to discount the cash flows of Tadpole. There are a number of reasons why this may not be appropriate.

- The **business risk** of the new investment may not match that of the investing company. If Tadpole is in a completely different line of business from Diversification, its cash flows are likely to be subject to differing degrees of risk, and this should be taken into account when valuing them.
- The **method of finance** of the new investment may not match the current debt/equity mix of the investing company, which may have an effect on the cost of capital to be used.



Question

Valuation methods

Profed provides a tuition service to professional students. This includes courses of lectures provided on their own premises and provision of study material for home study. Most of the lecturers are qualified professionals with many years' experience in both their profession and tuition. Study materials are written and word processed in-house, but sent out to an external printers.

The business was started fifteen years ago, and now employs around 40 full-time lecturers, 10 authors and 20 support staff. Freelance lecturers and authors are employed from time to time in times of peak demand.

The shareholders of Profed mainly comprise the original founders of the business who would now like to realise their investment. In order to arrive at an estimate of what they believe the business is worth, they have identified a long-established quoted company, City Tutors, who have a similar business, although they also publish texts for external sale to universities, colleges etc.

Summary financial statistics for the two companies for the most recent financial year are as follows.

	Profed	City Tutors
Issued shares (million)	4	10
Net asset values (\$m)	7.2	15
Earnings per share (cents)	35	20
Dividend per share (cents)	20	18
Debt: equity ratio	1:7	1:65
Share price (cents)		362
Expected rate of growth in earnings/dividends	9% pa	7.5% pa

Notes

- The net assets of Profed are the net book values of tangible non-current assets plus net working capital. However:
 - A recent valuation of the buildings was \$1.5m above book value

- Inventory includes past editions of text books which have a realisable value of \$100,000 below their cost
 - Due to a dispute with one of their clients, an additional allowance for bad debts of \$750,000 could prudently be made
- 2 Growth rates should be assumed to be constant per annum; Profed's earnings growth rate estimate was provided by the marketing manager, based on expected growth in sales adjusted by normal profit margins. City Tutors' growth rates were gleaned from press reports.
- 3 Profed uses a discount rate of 15% to appraise its investments, and has done for many years.

Required

- (a) Compute a range of valuations for the business of Profed, using the information available and stating any assumptions made.
- (b) Comment upon the strengths and weaknesses of the methods you used in (a) and their suitability for valuing Profed.

Answer

- (a) The information provided allows us to value Profed on three bases: net assets, P/E ratio and dividend valuation

All three will be computed, even though their validity may be questioned in part (b) of the answer.

Assets based

	\$'000
Net assets at book value	7,200
Add: increased valuation of buildings	1,500
Less: decreased value of inventory and receivables	<u>(850)</u>
Net asset value of equity	<u>7,850</u>
Value per share = \$1.96	

P/E ratio

	<i>Profed</i>	<i>City Tutors</i>
Issued shares (million)	4	10
Share price (cents)		362
Market value (\$m)		36.2
Earnings per shares (cents)	35	20
P/E ratio (share price ÷ EPS)		18.1

The P/E for a similar quoted company is 18.1. This will take account of factors such as marketability of shares, status of company, growth potential that will differ from those for Profed. Profed's growth rate has been estimated as higher than that of City Tutors, possibly because it is a younger, developing company, although the basis for the estimate may be questionable.

All other things being equal, the P/E ratio for an unquoted company should be taken as between one half to two thirds of that of an equivalent quoted company. Being generous, in view of the possible higher growth prospects of Profed, we might estimate an appropriate P/E ratio of around 12, assuming Profed is to remain a private company.

This will value Profed at $12 \times \$0.35 = \4.20 per share, a total valuation of \$16.8m.

Dividend valuation model

The dividend valuation method gives the share price as

$$\frac{\text{Next year's dividend}}{\text{Cost of equity} - \text{growth rate}}$$

which assumes dividends being paid into perpetuity, and growth at a constant rate.

For Profed, next year's dividend = $\$0.20 \times 1.09 = \0.218 per share

Whilst we are given a discount rate of 15% as being traditionally used by the directors of Profed for investment appraisal, there appears to be no rational basis for this. We can instead use the information for City Tutors to estimate a cost of equity for Profed. This is assuming the business risks to be similar, and ignoring the small difference in their gearing ratio.

Again, from the DVM, cost of equity = $\frac{\text{next year's dividend}}{\text{market price}} + \text{growth rate}$

For City Tutors, cost of equity = $\frac{\$0.18 \times 1.075}{\$3.62} + 0.075 = 12.84\%$

Using, say, 13% as a cost of equity for Profed (it could be argued that this should be higher since Profed is unquoted so riskier than the quoted City Tutors):

Share price = $\frac{\$0.218}{0.13 - 0.09} = \5.45

valuing the whole of the share capital at \$21.8 million

Range for valuation

The three methods used have thus come up with a range of value of Profed as follows.

	<i>Value per share</i>	<i>Total valuation</i>
	\$	\$m
Net assets	1.96	7.9
P/E ratio	4.20	16.8
Dividend valuation	5.45	21.8

(b) Comment on relative merits of the methods used, and their suitability

Asset based valuation

Valuing a company on the **basis of its asset values** alone is rarely appropriate if it is to be sold on a going concern basis. Exceptions would include property investment companies and investment trusts, the market values of the assets of which will bear a close relationship to their earning capacities.

Profed is typical of a lot of service companies, a large part of whose value lies in the **skill, knowledge and reputation of its personnel**. This is not reflected in the net asset values, and renders this method quite inappropriate. A potential purchaser of Profed will generally value its intangible assets such as knowledge, expertise, customer/supplier relationships, brands etc more highly than those that can be measured in accounting terms.

Knowledge of the net asset value (NAV) of a company will, however, be important as a **floor value** for a company in financial difficulties or subject to a takeover bid. Shareholders will be reluctant to sell for less than the net asset value even if future prospects are poor.

P/E ratio valuation

The P/E ratio measures the **multiple of the current year's earnings** that is reflected in the **market price** of a share. It is thus a method that reflects the earnings potential of a company from a market point of view. Provided the marketing is efficient, it is likely to give the most meaningful basis for valuation.

One of the first things to say is that the market price of a share at any point in time is determined by supply and demand forces prevalent during small transactions, and will be dependent upon a lot of factors in addition to a realistic appraisal of future prospects. A downturn in the market, economies and political changes can all affect the day-to-day price of a share, and thus its prevailing P/E ratio. It is not known whether the share price given for City Tutors was taken on one particular day, or was some sort of average over a period. The latter would perhaps give a sounder basis from which to compute an applicable P/E ratio.

Even if the P/E ratio of City Tutors can be taken to be **indicative of its true worth**, using it as a basis to value a smaller, unquoted company in the same industry can be problematic.

The status and marketability of shares in a quoted company have tangible effects on value but these are difficult to measure.

The P/E ratio will also be affected by **growth prospects** – the higher the growth expected, the higher the ratio. The growth rate incorporated by the shareholders of City Tutors is probably based on a more rational approach than that used by Profed.

If the growth prospects of Profed, as would be perceived by the market, did not coincide with those of **Profed management** it is difficult to see how the P/E ratio should be adjusted for relative levels of growth. The earnings yield method of valuation could however be useful here.

In the valuation in (a) a crude adjustment has been made to City Tutors' P/E ratio to arrive at a ratio to use to value Profed's earnings. This can result in a very inaccurate result if account has not been taken of all the differences involved.

Dividend based valuation

The dividend valuation model (DVM) is a **cash flow based approach**, which valued the dividends that the shareholders expect to receive from the company by discounting them at their required rate of return. It is perhaps more appropriate for valuing a minority shareholding where the holder has no influence over the level of dividends to be paid than for valuing a whole company, where the total cash flows will be of greater relevance.

The practical problems with the dividend valuation model lie mainly in its **assumptions**. Even accepting that the required 'perfect capital market' assumptions may be satisfied to some extent, in reality, the formula used in (a) assumes constant growth rates and constant required rates of return in perpetuity.

Determination of an **appropriate cost of equity** is particularly difficult for a unquoted company, and the use of an 'equivalent' quoted company's data carries the same drawbacks as discussed above. Similar problems arise in estimating future growth rates, and the results from the model are highly sensitive to changes in both these inputs.

It is also highly dependent upon the **current year's dividend** being a representative base from which to start.

The dividend valuation model valuation provided in (a) results in a higher valuation than that under the P/E ratio approach. Reasons for this may be:

- The **share price** for City Courses may be currently **depressed below its normal level**, resulting in an inappropriately low P/E ratio
- The **adjustment** to get to an **appropriate P/E ratio** for Profed may have been too harsh, particularly in light of its apparently better growth prospects
- The **cost of equity** used in the dividend valuation model was that of City Courses. The validity of this will largely depend upon the relative levels of risk of the two companies. Although they both operate the same type of business, the fact that City Courses sells its material externally means it is perhaps less reliant on a fixed customer base
- Even if business risks and gearing risk may be thought to be comparable a prospective buyer of Profed may consider investment in a **younger, unquoted company** to carry **greater personal risk**. His required return may thus be higher than that envisaged in the dividend valuation model, reducing the valuation

Exam focus point

You must be able to discuss the values you calculate so do not concentrate purely on the calculations and lose valuable marks.

In Chapter 15, we looked at how to calculate the cost of debt and other financial assets. The same formulae can be rearranged so that we can calculate their value.

FAST FORWARD

For **irredeemable debt**:

$$\begin{aligned} \text{Market price, ex interest } (P_0) &= \frac{I}{K_d} \\ &= \frac{i(1 - T) \text{ with tax}}{K_{dnet}} \end{aligned}$$

For **redeemable debt**, the market value is **the discounted present value of future interest receivable**, up to the year of redemption, plus the **discounted present value of the redemption payment**.

5.1 Debt calculations – a few notes

- (a) Debt is always quoted in **\$100 nominal units**, or blocks; always use \$100 nominal values as the basis to your calculations.
- (b) Debt can be quoted in **%** or as a **value**, eg 97% or \$97. Both mean that \$100 nominal value of debt is worth \$97 market value.
- (c) Interest on debt is stated as a **percentage of nominal value**. This is known as the coupon rate. It is **not** the same as the redemption yield on debt or the cost of debt.
- (d) The examiner sometimes quotes an **interest yield**, defined as coupon/market price.
- (e) Always use **ex-interest prices** in any calculations.

5.2 Irredeemable debt

For **irredeemable bonds** where the company will go on paying interest every year in perpetuity, without ever having to redeem the loan (ignoring taxation):

Formula to learn

$$P_0 = \frac{i}{K_d}$$

where P_0 is the market price of the bond ex interest, that is, excluding any interest payment that might soon be due

i is the annual interest payment on the bond

K_d is the return required by the bond investors

With taxation, we have the following:

Formula to learn

Irredeemable (undated) debt, paying annual after tax interest $i(1 - T)$ in perpetuity, where P_0 is the ex-interest value:

$$P_0 = \frac{i(1 - T)}{K_{dnet}}$$

5.3 Redeemable debt

The valuation of redeemable debt depends on future expected receipts. The market value is the discounted present value of future interest receivable, up to the year of redemption, **plus** the discounted present value of the redemption payment.

$$\text{Value of debt} = (\text{Interest earnings} \times \text{annuity factor}) + (\text{Redemption value} \times \text{Discounted cash flow factor})$$

5.4 Example: Valuation of debt

12/08

Furry has in issue 12% bonds with par value \$100,000 and redemption value \$110,000, with interest payable quarterly. The redemption yield on the bonds is 8% annually and 2% quarterly. The bonds are redeemable on 30 June 20X4 and it is now 31 December 20X0.

Required

Calculate the market value of the bonds.

Solution

You need to use the redemption yield cost of debt as the discount rate, and remember to use an annuity factor for the interest. We are discounting over 14 periods using the quarterly discount rate (8%/4).

Period		Cash flow	Discount factor	Present value
		\$	2%	\$
1–14	Interest	3,000	12.11	36,330
14	Redemption	110,000	0.758	83,380
				<u>119,710</u>

Market value is \$119,710.



Question

Value of redeemable debt

A company has issued some 9% bonds, which are now redeemable at par in three years time. Investors now require a redemption yield of 10%. What will be the current market value of each \$100 of bond?

Answer

Year		Cash flow	Discount factor	Present value
		\$	10%	\$
1	Interest	9	0.909	8.18
2	Interest	9	0.826	7.43
3	Interest	9	0.751	6.76
3	Redemption value	100	0.751	75.10
				<u>97.47</u>

Each \$100 of bond will have a market value of \$97.47.

5.5 Convertible debt

6/08

Convertible bonds were discussed in Section 2 of [Chapter 12](#). As a reminder, when convertible bonds are traded on a stock market, its **minimum market price** will be the price of straight bonds with the same coupon rate of interest. If the market value falls to this minimum, it follows that the market attaches no value to the conversion rights.

The actual market price of convertible bonds will depend on:

- The price of straight debt
- The current conversion value
- The length of time before conversion may take place
- The market's expectation as to future equity returns and the associated risk

If the conversion value rises above the straight debt value then the price of convertible bonds will normally reflect this increase.

Formula to learn

$$\text{Conversion value} = P_0 (1 + g)^n R$$

where P_0 is the current ex-dividend ordinary share price
 g is the expected annual growth of the ordinary share price
 n is the number of years to conversion
 R is the number of shares received on conversion

The current **market value** of a convertible bond where conversion is expected is the sum of the present values of the future interest payments and the present value of the bond's conversion value.

5.6 Example: Valuation of convertible debt

What is the value of a 9% convertible bond if it can be converted in five years time into 35 ordinary shares or redeemed at par on the same date? An investor's required return is 10% and the current market price of the underlying share is \$2.50 which is expected to grow by 4% per annum.

Solution

$$\text{Conversion value} = P_0 (1 + g)^n R = 2.50 \times 1.04^5 \times 35 = \$106.46$$

$$\text{Present value of \$9 interest per annum for five years at 10\%} = 9 \times 3.791 = \$34.12$$

$$\text{Present value of the conversion value} = 106.46 \times 0.621 = \$66.11$$

$$\text{Current market value of convertible bond} = 34.12 + 66.11 = \$100.23$$

5.7 Preference shares

Preference shares pay a fixed rate dividend which is not tax-deductible for the company.

Formula to learn

The current ex-dividend value P_0 , paying a constant annual dividend d and having a cost of capital k_{pref} :

$$P_0 = \frac{d}{K_{\text{pref}}}$$

Chapter Roundup

- There are a number of different ways of **putting a value on a business**, or on shares in an unquoted company. It makes sense to use **several methods** of valuation, and to compare the values they produce.
- The **net assets valuation** method can be used as one of many valuation methods, or to provide a lower limit for the value of a company. By itself it is unlikely to produce the most realistic value.
- **P/E ratios** are used when a large block of shares, or a whole business, is being valued. This method can be problematic when quoted companies' P/E ratios are used to value unquoted companies.
- Cash flow based valuation models include the **dividend valuation model**, the **dividend growth model** and the **discounted cash flow basis**.
- For **irredeemable debt**:

$$\begin{aligned}\text{Market price, ex interest } (P_0) &= \frac{I}{K_d} \\ &= \frac{i(1 - T) \text{ with tax}}{K_{dnet}}\end{aligned}$$

For **redeemable debt**, the market value is **the discounted present value of future interest receivable**, up to the year of redemption, plus the **discounted present value of the redemption payment**.

Quick Quiz

- 1 Give four circumstances in which the shares of an unquoted company might need to be valued.
- 2 How is the P/E ratio related to EPS?
- 3 What is meant by 'multiples' in the context of share valuation?
- 4 Suggest two circumstances in which net assets might be used as a basis for valuation of a company.
- 5 Cum interest prices should always be used in calculations involving debt. True/False?
- 6 **Fill in the blanks.** For redeemable debentures:

Market value = +

Answers to Quick Quiz

- 1 (a) Setting an issue price if the company is floating its shares
(b) When shares are sold
(c) For tax purposes
(d) When shares are pledged as collateral for a loan
- 2 P/E ratio = Share price/EPS
- 3 The P/E ratio: the multiple of earnings at which a company's shares are traded
- 4 (a) As a measure of asset backing
(b) For comparison, in a scheme of merger
- 5 False. Ex interest prices should be used
- 6 Market value
= Discounted present value of future interest receivable up to year of redemption
+ Discounted present value of redemption payment

Now try the question below from the Exam Question Bank

Number	Level	Marks	Time
Q25	Introductory	N/A	45 mins
Q26	Examination	25	45 mins