Chapter 19
THE COST OF CAPITAL

LEARNING OUTCOMES

By the end of this chapter the reader will be able to:

- calculate and explain the cost of debt capital, both before and after tax considerations;
- describe the difficulties in estimating the equity cost of capital and explain the key elements that require informed judgement;
- calculate the weighted average cost of capital (WACC) for a company and explain the meaning of the number produced;
- describe the evidence concerning how UK companies actually calculate the WACC;
- explain the outstanding difficulties in this area of finance.

KEY POINTS AND CONCEPTS

- **The cost of capital** is the rate of return that a company has to offer finance providers to induce them to buy and hold a financial security.

- The **weighted average cost of capital (WACC)** is calculated by weighting the cost of debt and equity in proportion to their contribution to the total capital of the firm:

$$\text{WACC} = k_E W_E + k_{DAT} W_D$$

- **The WACC can be lowered** (or raised) by altering the proportion of debt in the capital structure:

- **Investors in shares** require a return, k_E, which provides for two elements:
  - a return equal to the risk-free rate; plus
  - a risk premium.

  The most popular method for calculating the risk premium has two stages:
  - estimate the average risk premium for shares $(r_m - r_f)$; and:
  - adjust the average premium to suit the risk on a particular share.

  The CAPM using a beta based on the relative co-movement of a share with the market has been used for the second stage but other risk factors appear to be relevant.

- An alternative method for calculating the required rate of return on equity is to use the **Gordon growth model**:

$$k_E = \frac{d_1}{P} + g$$

- The **cost of retained earnings** is equal to the expected returns required by shareholders buying new shares in a firm.

- The **cost of debt capital**, k_D, is the current market rate of return for a risk class of debt. The cost to the firm is reduced to the extent that interest can be deducted from taxable profits:

$$k_{DAT} = k_{DBT} (1 - T)$$

- The **cost of irredeemable constant dividend preference share capital** is:

$$k_p = \frac{d_1}{P_p}$$

- The **weights in the WACC are based on market values,** not balance sheet values.
- For projects, etc. with similar risk to that of the existing set, use the WACC, which is based on the target debt to equity ratio. **Do not use the cost of the latest capital raised.**
- For projects, SBUs, etc. of a **different risk level from that of the firm,** raise or lower the discount rate in proportion to the risk.
- Companies use a mixture of theoretically correct techniques with rules of thumb to calculate hurdle rates of return.
- Calculating a cost of capital relies a great deal on judgement rather than scientific precision. But there is a theoretical framework to guide that judgement.
- **Difficulties remaining:**
  - estimating the equity risk premium;
  - obtaining the risk free rate;
  - unreliability of the CAPM's beta.
- **Fundamental beta** is based on factors thought to be related to systematic risk:
  - type of business;
  - operating gearing;
  - financial gearing.

ANSWERS TO SELECTED QUESTIONS

1 **Burgundy plc**

   a *Cost of debt capital*

$$105 = \frac{10}{1 + r} + \frac{10}{(1 + r)^2} + \frac{10}{(1 + r)^3} + \frac{110}{(1 + r)^4}$$

   Try 9%

10×2.5313	25.313
110×0.7084	77.924
	103.237

   Try 8%

10×2.5771	25.771
110×0.735	80.850
	106.621

8%	?	9%
106.621	105	103.237

$$8 + \frac{1.621}{3.384} (9 - 8) = 8.48\%$$

$$k_{DAT} = k_{DBT}(1 - T) = 8.48 (1 - 0.30) = 5.94\%$$

   b *Cost of equity capital*

$$k_E = r_f + \beta (r_m - r_f)$$

$$k_E = 8 + 0.85 \times 5.0 = 12.25\%$$

c *WACC*

$$\text{WACC} = k_E W_E + k_{DAT} W_D$$

Weights:			*Weight*
Equity		£4.00m	4/9.25 = 0.43
Debt	$\frac{105}{100} \times$ £5m =	£5.25m	5.25/9.25 = 0.57
		£9.25m	

$$\text{WACC} = 12.25 \times 0.43 + 5.94 \times 0.57 = 8.65\%$$

d Consult Chapter 19.