# Chapter 21
# CAPITAL STRUCTURE

## LEARNING OUTCOMES

The level of debt relative to ordinary share capital is, for most firms, of secondary consideration behind strategic and operational decisions. However, if wealth can be increased by getting this decision right managers need to understand the key influences. By the end of the chapter the reader should be able to:

- discuss the effect of gearing, and differentiate business and financial risk;
- describe the underlying assumptions, rationale and conclusions of Modigliani and Miller's models, in worlds with and without tax;
- explain the relevance of some important, but often non-quantifiable, influences on the optimal gearing level question.

## KEY POINTS AND CONCEPTS

- **Financial gearing** concerns the proportion of debt in the capital structure.
- **Operating gearing** refers to the extent to which the firm's total costs are fixed.
- **Capital gearing** can be measured in a number of ways. For example:
  1 $\dfrac{\text{Long-term debt}}{\text{Shareholders' funds}}$
  2 $\dfrac{\text{Long-term debt}}{\text{Long-term debt + Shareholders' funds}}$
  3 $\dfrac{\text{All borrowing}}{\text{All borrowing + Shareholders' funds}}$
  4 $\dfrac{\text{Long-term debt}}{\text{Total market capitalisation}}$
- **Income gearing** is concerned with the proportion of the annual income stream which is devoted to the prior claims of debt holders.
- The **effect of financial gearing** is to magnify the degree of variation in a firm's income for shareholders' returns.
- **Business risk** is the variability of the firm's operating income (before interest).
- **Financial risk** is the additional variability in returns to shareholders due to debt in the financial structure.
- In **Modigliani and Miller's perfect no-tax world** three propositions hold true:
  1 The total market value of any company is independent of its capital structure.
  2 The expected rate of return on equity increases proportionately with the gearing ratio.
  3 The cut-off rate of return for new projects is equal to the weighted average cost of capital – which is constant regardless of gearing.
- In an **MM world with tax** the optimal gearing level is the highest possible.
- The **risk of financial distress** is one factor which causes firms to moderate their gearing levels. Financial distress is where obligations to creditors are not met, or are met with difficulty.

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- The **indirect costs of financial distress**, such as deterioration in relationships with suppliers, customers and employees, can be more significant than the direct costs, such as legal fees.
- **Financial distress risk is influenced by the following**:
  - the sensitivity of the company's revenues to the general level of economic activity;
  - the proportion of fixed to variable costs;
  - the liquidity and marketability of the firm's assets;
  - the cash-generative ability of the business.
- **Agency costs** are the direct and indirect costs of ensuring that agents (e.g. managers) act in the best interests of principals (e.g. shareholders), for example monitoring costs, restrictive covenants, loss of managerial freedom of action and opportunities forgone.
- **Financial distress and agency costs eventually outweigh the lower cost of debt** as gearing rises causing the WACC to rise and the firm's value to fall.
- **Borrowing capacity** is determined by the assets available as collateral – this restricts borrowing.
- There is often a **managerial preference** for a lower risk stance on gearing.
- **The pecking order** of finance:
  1 internally generated funds;
  2 borrowings;
  3 new issue of equity.

  The reasons for the pecking order:
  - equity issue perceived as 'bad news' by the markets;
  - line of least resistance;
  - transaction costs.
- **Financial slack** means having cash (or near-cash) and/or spare debt capacity so that opportunities can be exploited quickly (and trouble avoided) as they arise in an unpredictable world and to provide a contingency reserve – it tends to reduce borrowing levels.
- **Signalling** An increased gearing level is taken as a positive sign by the financial markets because managers would only take the risk of financial distress if they were confident about future cash flows.
- The source of finance chosen may be determined by the effect on the **control** of the organisation.
- Managers may be tempted to adopt the **industry group gearing** level.
- It is suggested that high gearing **motivates** managers to perform if they have a stake in the business, or if a smaller group of shareholders are given the incentive to monitor and control managers.
- **Reinvestment risk** is diminished by high gearing.
- It is argued that **operating and strategic efficiency** can be pushed further by high gearing.

## ANSWERS TO SELECTED QUESTIONS

**1 Vodafone plc**

Capital gearing ratios:

$$\text{Capital gearing (1)} = \frac{\text{Long-term debt}}{\text{Shareholders' funds}} = \frac{13{,}757}{131{,}534} = 10.5\%$$

$$\text{Capital gearing (2)} = \frac{\text{Long-term debt}}{\text{Long-term debt + shareholders' funds}} = \frac{13{,}757}{13{,}757 + 131{,}534} = 9.5\%$$

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$$\text{Capital gearing (3)} = \frac{\text{All borrowing}}{\text{All borrowing + shareholders' funds}} = \frac{13{,}757 + 1{,}078}{13{,}757 + 1{,}078 + 131{,}534} = 10.1\%$$

$$\text{Capital gearing (4)} = \frac{\text{Long-term debt}}{\text{Total market capitalisation}} = \frac{13{,}757}{95{,}550} = 14.4\%$$

*Note*: Some students may include 'provisions for liabilities and charges' – this is acceptable.

Income gearing:

$$\frac{\text{Interest charges}}{\text{Profit before interest and taxation}} = \frac{752}{\text{Loss}}$$

Interest cover:

$$\frac{\text{Profit before interest and taxation}}{\text{Interest charges}} = \frac{\text{Loss}}{752}$$

*Comments*

- Apparently relatively low gearing levels/low financial risk. (However, most of Vodafone's 'assets' (£92,833m) are goodwill arising from acquisitions.)
- The loss may appear to make Vodafone risky. Need to investigate free cash flow generation to confirm.
- Very difficult to measure gearing with precision due to the alternative inputs and metrics.
- Off-balance sheet finance could, if included, present a different picture.

**2 Eastwell plc**

**a**

| | £ | £ | £ |
|---|---|---|---|
| Cash flow | 60,000 | 160,000 | 300,000 |
| *All-equity structure* | | | |
| Return on equity | $\frac{60{,}000}{1{,}000{,}000} = 6\%$ | $\frac{160{,}000}{1{,}000{,}000} = 16\%$ | $\frac{300{,}000}{1{,}000{,}000} = 30\%$ |
| *40% gearing* | | | |
| Debt interest @ 12% | 48,000 | 48,000 | 48,000 |
| Earnings available for shareholders | 12,000 | 112,000 | 252,000 |
| Return on equity | $\frac{12{,}000}{600{,}000} = 2\%$ | $\frac{112{,}000}{600{,}000} = 18.67\%$ | $\frac{252{,}000}{600{,}000} = 42\%$ |
| *80% gearing* | | | |
| Debt interest @ 13% | 104,000 | 104,000 | 104,000 |
| Earnings available for shareholders | –44,000 | 56,000 | 196,000 |
| Return on equity | $\frac{-44{,}000}{200{,}000} = -22\%$ | $\frac{56{,}000}{200{,}000} = 28\%$ | $\frac{196{,}000}{200{,}000} = 98\%$ |

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**a** and **b** **Expected returns and standard deviations**

| *Return* $R_i$% | *Probability* | *Return* × *probability* | $(R_i - \bar{R})^2 p$ |
|---|---|---|---|
| *All equity* | | | |
| 6 | 0.25 | 1.50 | 30.25 |
| 16 | 0.50 | 8.00 | 0.50 |
| 30 | 0.25 | 7.50 | 42.25 |
| Expected return, $\bar{R}$ | | 17.00% | $\sigma^2$ 73.00 |
| Standard deviation, σ | | | 8.54% |
| *40% gearing* | | | |
| 2 | 0.25 | 0.5 | 84.04 |
| 18.67 | 0.50 | 9.335 | 1.39 |
| 42 | 0.25 | 10.50 | 117.34 |
| Expected return, $\bar{R}$ | | 20.335% | $\sigma^2$ 202.77 |
| Standard deviation, σ | | | 14.24% |
| *80% gearing* | | | |
| –22 | 0.25 | –5.5 | 756.25 |
| 28 | 0.50 | 14.0 | 12.50 |
| 98 | 0.25 | 24.5 | 1,056.25 |
| Expected return, $\bar{R}$ | | 33.0 | $\sigma^2$ 1,825.00 |
| Standard deviation, σ | | | 42.72% |

**c**

| *Gearing* | *Expected return* % | *Standard deviation* % | *Business risk* % | *Remaining risk due to financial risk* % |
|---|---|---|---|---|
| All equity | 17 | 8.54 | 8.54 | |
| 40% | 20.34 | 14.24 | 8.54 | 5.7 |
| 80% | 33 | 42.72 | 8.54 | 34.18 |

*Business risk*: The variability of the firm's operating income.

*Financial risk*: The additional variability in returns to shareholders due to debt in the financial structure.

**d** Consult main text, Chapter 21.

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

$\text{WACC} = 15 \times 0.7 + 9(1 - 0.30) \times 0.3 = 12.39\%$

Value of the firm:

$$\frac{750{,}000}{0.1239} = £6{,}053{,}268$$


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**b** *Director A*

WACC = $15 \times 0.4 + 9(1 - 0.30) \times 0.6 = 9.78\%$

Value of the firm $= \dfrac{750{,}000}{0.0978} = £7{,}668{,}712$

*Director B*

WACC = $23.7 \times 0.4 + 9(1 - 0.30) \times 0.6 = 13.26\%$

Value of the firm $= \dfrac{750{,}000}{0.1326} = £5{,}656{,}109$

*Director C*

WACC = $17 \times 0.4 + 9(1 - 0.30) \times 0.6 = 10.58\%$

Value of the firm $= \dfrac{750{,}000}{0.1058} = £7{,}088{,}847$

*Director D*

WACC = $28 \times 0.4 + 9(1 - 0.30) \times 0.6 = 14.98\%$

Value of the firm $= \dfrac{750{,}000}{0.1498} = £5{,}006{,}676$

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