

Section IV:

MANAGING RISK

THE FINANCIAL RISKS MANAGERS HAVE TO DEAL WITH

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Introduction

Running a business naturally entails taking risks – it is what business activity is about. Satisfactory profits rarely emerge from a risk-eliminating strategy; some risk is therefore inevitable. However it is up to managers of firms to select those risks the business might take and those that it should avoid. Take a company like GlaxoSmithKline which accepts high risks in its research and development program. Should it also take a risk with exchange rates when it receives money from sales around the world, or should it try to minimize that particular type of risk?

taking risks is what business activity is about.

Risk reduction is often costly. For example, insurance premiums may be payable or transaction costs may be incurred in the derivative markets. Given the additional cost burden managers have to think carefully about the benefits to be derived from reducing or eliminating risk. There are at least three reasons firms sacrifice some potential profits in order to reduce the impact of adverse events.

- *It helps financial planning* Being able to predict future cash flows, at least within certain boundaries, can be advantageous and can allow the firm to plan and invest with confidence. Imagine trying to organize a business if the future cash flows can vary widely depending on what happens to the currency, the interest rate or the price of a vital raw material input.
- *Reduce the fear of financial distress* Some events can disrupt and damage a business to the point of threatening its existence. For example, massive claims have been made against firms involved in the production of asbestos. If it had not been for the passing on of this risk to the insurance companies many of these firms would now be liquidated. A similar logic applies to the insurance of super tankers against an ocean oil spillage. By limiting the potential damage inflicted on firms, not only will the managers and shareholders benefit, but other finance providers, such as banks, will have greater confidence, which will lower the cost of capital.
- *Some risks are not rewarded* It is possible to reduce risk in situations where there are no financial rewards for accepting that extra risk. For example, if British Airways contracted to buy a dozen aircraft from Boeing for delivery over the next ten years and had to pay in dollars as each airplane was completed it would have to accept the risk of a recession in international flights and numerous other risks, but, in the sophisticated foreign exchange markets of today, at least it can eliminate one risk. It does not have to live with any uncertainty about the cost of the airplanes in terms of sterling because it could make an arrangement with a bank at the outset to purchase the required number of dollars for a specified number of pounds at set dates in the future. (These are forward agreements.) British Airways would then know precisely how many pounds will be needed to buy the dollars to pay Boeing in each year of the next decade (*see* Chapter 21 for more currency risk-hedging strategies).

Types of risk

A commercial organization has to deal with many different types of risk and we will discuss the four most important: business risk, insurable risk, currency risk and interest-rate risk.

Business risk

Many of the risks of operating in a competitive business environment have to be accepted by management to a greater or lesser extent. Sales may fall because of, say, recession, or innovative breakthroughs by competitors. Costs may rise because of, say, strong union power or government-imposed tariffs. For some of these risk elements there is little that management can do. However in many areas management can take positive action to reduce risk. For example consider a bakery company heavily dependent on buying in wheat. The managers are likely to be worried that the price of wheat may rise over the forthcoming months, thereby making their operations unprofitable. On the other hand farmers may be worried by the possibility of wheat falling in price. Both would value certainty. One way of achieving this is for the baker and farmer to enter into a wheat futures agreement, in which the baker agrees to take delivery of wheat at a later date at a price that is agreed today. Both sides now know exactly how much the wheat will be sold for and so can plan ahead.

There are other ways of reducing business risk. For example, firms are often faced with a choice between two machines. The first is highly specialized to a particular task, for example, turning out a particular component. The second, slightly more expensive machine can turn out the same component, but can also be used in a more flexible fashion to switch production to other components. The option to use the machine in alternative ways can sometimes have a high value and so it is worthwhile paying the extra initial set-up costs and even higher production costs.

Consider also an electricity generator contemplating the construction of a power plant. The installation of a coal-fired station would be £100m. This would leave the generator dependent on coal price movements for future profitability. An alternative power plant can be switched from coal to gas but costs an additional £30m. The value of the option to switch is then for the management to evaluate and weigh against the extra cost of construction.

Likewise, a car production line may be more expensive if it is to be capable of being used for a number of different models. But the option to use the facility for more than one type of car reduces the firm's risk by making it less dependent on one model. These are examples of real options, which are considered further in Chapter 19.

Insurable risk

Many risks encountered by business can be transferred, through the payment of a premium, to insurance companies. These include factory fires, pollution damage and accidental damage to vehicles and machinery. Insurance companies are often better able to bear risk than ordinary commercial firms. The reasons for this are the following:

- experience in estimating probabilities of events and therefore ‘pricing’ risk more efficiently;
- knowledge of methods of reducing risk. They can pass on this knowledge to the commercial firms which may obtain lower premiums if they take precautionary measures;
- ability to *pool* risks, in other words, to diversify risk. The chance of an accident occurring in one firm is highly uncertain, but the probability of a particular proportion of a portfolio of insurance policies making a claim is fairly predictable.

Insurance can be an expensive option because of the tendency for insurance companies to charge for much more than the probability of having to pay out. For example, if there was a one in a hundred chance of your £10,000 car being stolen in a year and never recovered then for every 100 cars insured the insurance company will expect one £10,000 claim per year. The insurance premium to each owner to cover this specific type of risk would, justifiably, be slightly over £100 (£10,000/100), to allow for a modest profit. However, in reality, the premium may be much more than this. The insurance company is likely to have to bear significant administrative costs in setting up the policy in the first place and then dealing with subsequent claims. Anyone who has had to communicate with an insurance company quickly becomes aware of the mountain of paperwork they generate annually. Insurance companies also have to charge premiums sufficiently high to cover the problems of ‘adverse selection’. Put it this way: you may be a sensible car owner, being cautious about where you park your car, never

The grouping together of good and bad risks tends to increase the cost of insurance.

leave the doors unlocked and live in a good part of town, but many of the other purchasers of theft insurance may be less fastidious and fortunate. The grouping together of good and bad risks tends to increase the cost of insurance to relatively good policy-

holders. This is made worse for the good policyholders by the increased tendency of those in high-risk situations to buy insurance.

The third boost to insurance premiums comes from ‘moral hazard’ (the encouragement of bad behavior) which causes holders of insurance to be less careful than they might otherwise be – the ‘It’s all right, don’t worry, it’s insured’ syndrome. An extreme example of moral hazard has been created with the ‘new-for-old’ policies for electrical items in which a brand new TV, for example, is provided should the old one suffer accidental damage – some have been tempted to ‘accidentally’ drop the TV!

These three additional costs may push insurance premiums beyond acceptable levels for a firm. In some cases large corporations have taken the bold decision to bear many insurable risks. They may still pay insurance premiums to safeguard against major events which threaten the continuance of the firm but accept routine risks themselves such as machine breakdown, accidents at work, etc. There seems little point in paying premiums just to receive a regular, but lower, inflow in return.

Currency risk

Another major area of responsibility for the corporate treasurer is in the management of risk that arises because exchange rates move. Take the case of Acarus plc which has sold electrical goods to an Australian importer on six months' credit. The importer is sent an invoice requiring payment of A\$20m. The current exchange rate is two Australian dollars to one pound so if currency rates do not change in the subsequent six months Acarus will receive £10m. If the exchange moves to A\$1.80 : £1 then Acarus will receive £11.11m, and will be very pleased with the extra £1.11m of income. However matters might turn out worse than expected. Say the rate of exchange moved to A\$2.20 : £1. Then Acarus would receive only £9.09m. If the management team are risk averse they may say to themselves, 'While we like the possibility of making additional profit on the deal this is more than outweighed by the downside risk of making less than £10m'. There are various ways of ensuring that Acarus receives at least £10m and Chapter 21 is devoted to the subject of exchange-rate risk management. Here we will have just a taster. One of the possibilities is for Acarus to buy an option giving the firm the right but not the obligation to exchange A\$20m for sterling at a rate of A\$2 : £1 in six months. If the dollar appreciates against the pound to A\$1.80 then Acarus would choose not to exercise the option – to let it lapse – and then exchange the A\$20m for £11.11m in the spot market in six months' time. Alternatively, if the dollar falls against sterling Acarus would insist on exercising the option to receive £10m rather than exchanging at the spot rate of A\$2.20 : £1 and therefore achieving a mere £9.09m. By purchasing the option Acarus ensures that the lowest amount it will receive is £10m and the upside potential is unrestrained. However it would need to pay a hefty premium to the option seller for passing on this risk – perhaps 2 to 4 percent of the amount covered. The difficult part is weighing the cost of risk-reducing action against the benefit.

Interest-rate risk

Interest rates cannot be predicted with any degree of accuracy. If a company has large amounts of floating-rate debt it could be vulnerable to interest-rate rises. Alternatively, a company with large fixed-rate debt could have to face living with regret, and higher debt costs than necessary, if interest rates fall.

There is a wide variety of arrangements and financial products which enable a treasurer to reduce the firm's exposure to the vicissitudes of interest rates. Chapter 20 explores a number of them. Here we examine one of the weapons in the treasurer's armoury – the cap.

Ace plc wishes to borrow £20m to finance a major expansion. It does so at a floating rate of LIBOR plus 150 basis points. LIBOR is currently 8 percent and therefore Ace pays a rate of 9.5 percent. This loan is a large sum relative to Ace's capital base and profits, and the management are concerned that if LIBOR rises above 10 percent the firm will get into serious financial difficulty. To avoid this Ace purchases a cap agreement by which a bank promises to pay any interest charge above a LIBOR of 10 percent. Thus, if two years later LIBOR rises to 11 percent, without the cap Ace would pay 12.5 percent. However, Ace can call upon the bank that made the cap agreement to pay the extra 1 percent. Ace's interest charge cannot go beyond a total of $(10 \text{ percent} + 1.5 \text{ percent}) = 11.5 \text{ percent}$. What is more, Ace can benefit if interest rates fall because rates are linked to a variable LIBOR at any rate below the cap. The premium charged by the bank for this form of interest-rate insurance can be quite substantial but there are ways of offsetting this cost, for example by simultaneously selling a floor, but consideration of these will have to wait until Chapter 20. Suffice to say, the judicious management of interest-rate risk can be an important managerial task.

Risk in the financial structure

Obtaining the most appropriate mixture of finance is likely to be of great importance to most firms. The key issues are: whether your firm should be borrowing more through short-term lending agreements, by overdraft, say, or whether more long-term types of finance are more appropriate, (should you, for instance increase the proportion of long-term finance (debt plus equity) until it matches the value of all the firm's assets, or only to the point where long-term finance covers the long-term asset values and short-term finance is used for the purchase of short-term assets?); whether you should borrow only in your home currency or in a variety of currencies, perhaps to match the currencies in which the firm's assets and sources of revenue originate; whether fixed-rate interest rates are more appropriate than interest rates that go up and down with a benchmark rate, such as LIBOR. Finally, we need to work out what is an appropriate level of borrowing relative to the equity capital held in the company given the trade off between the lower rate of return demanded on debt capital and the dangers of taking on more borrowing.

Is it better to borrow long or short?

Once a company has decided to raise funds by borrowing, it then has to decide whether to raise the money through:

- short-term debt – a loan which has to be repaid within, say, one year;
- medium-term debt; or
- long-term debt – where the loan is paid over a 10-, 25- or even 100-year period.

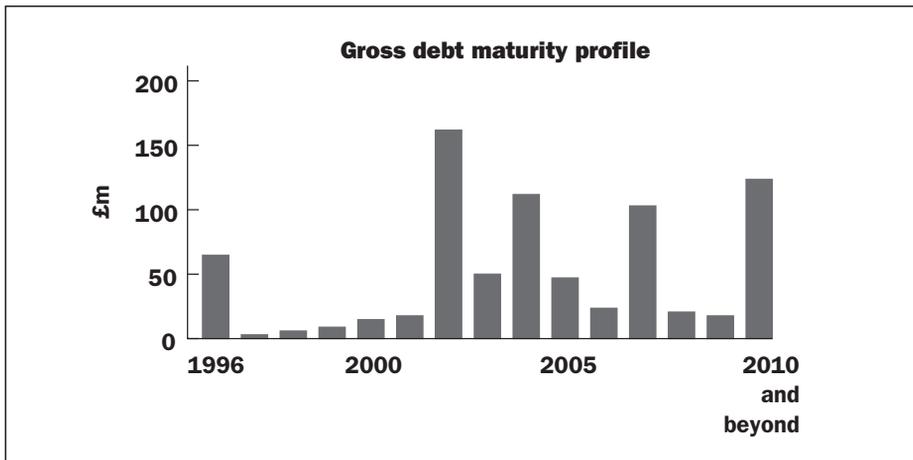
A number of factors need to be taken into consideration when making a decision of this nature.

- *Maturity structure* A company will usually try to avoid having all of its debts maturing at or near the same date. It could be disastrous if the firm was required to repay loan capital on a number of different instruments all within, say, a six-month period. Even if the firm is profitable the sudden cash outflow could lead to insolvency. A number of major UK retailers came perilously close to this in the early 1990s. In the late 1980s they had experienced a boom in sales and everything the management touched seemed to turn to gold. Buoyed up by overoptimism, they opened up dozens of new branches, funded to a large extent by medium-term finance. By the time these bank loans, bonds, etc. came to maturity in the early 1990s these shop chains were already suffering from a biting recession and an excessive cost base. Negotiations with bankers and others were necessary as loan covenants were broken and bankruptcy loomed. Most of the larger groups survived but they have learnt a hard lesson about the importance of spreading the dates for principal repayment.

Thames Water plc regards this issue as sufficiently important for it to include a graph in its annual accounts showing the years in which its debt matures – see Figure 18.1.

FIGURE 18.1

An example of a company conscious of the necessity for a range of maturity dates for debt – Thames Water plc



Source: Thames Water, Annual Report and Accounts 1995

- *Costs of issue/arrangement* It is usually cheaper to arrange an overdraft and other one-off short-term finance than long-term debt facilities, but this advantage is sometimes outweighed by the fact that if funds are needed over a number of years short-term debt has to be renewed more often than long-term debt. So over, say, a 20-year period, the issuing and arrangement costs of short-term debt may be much greater than a 20-year bond.
- *Flexibility* Short-term debt is more flexible than long-term debt. If a business has fluctuations in its needs for borrowed funds, for example it is a seasonal business, then for some months it does not need any borrowing funds, whereas at other times it needs large loans. A long-term loan may be inefficient because the firm will be paying interest even if it has surplus cash. True, the surplus cash could be invested but the proceeds are unlikely to be as great as the cost of the loan interest. It is cheaper to take out short-term loans or overdrafts when the need arises which can be paid back when the firm has high cash inflows.
- *The uncertainty of getting future finance* If a firm is investing in a long-term project which requires borrowing for many years it would be risky to finance this project using one-year loans. At the end of each year the firm has to renegotiate the loan or issue a new bond. There may come a time when lenders will not supply the new money. There may, for example, be a change in the bank's policy or a reassessment of the borrower's creditworthiness, a crisis of confidence in the financial markets or an imposition of government restrictions on lending. Whatever the reason, the project is halted and the firm loses money.

To some extent, the type of project or asset that is acquired determines the type of borrowing. If the project or asset is liquid and short term then short-term finance may be favored. If it is long term then longer-term borrowing gives more certainty about the availability of finance, and (possibly) the interest rate.

- *The term structure of interest rates* The term structure of interest rates describes how the same borrower (same risk class of borrower, at least) has the pay different interest rates depending on whether the loan is for 1, 2, 3, 4, 10 or 30 years. On a graph with number of years to maturity of the loan along the x-axis and interest rate on the y-axis we observe a rising or declining interest rate as the length of time to maturity of the loan increases. This is called a yield curve. It is usual to find interest rates on short-term borrowing are lower than on long-term debt.¹ This may encourage managers to borrow on a short-term basis. In many circumstances this makes sense. Take the case of Myosotis plc, which requires £10m of borrowed funds for a ten-year project. The corporate treasurer expects long-term interest rates to fall over the next year. It is therefore thought unwise to borrow for the full ten years at the outset. Instead the firm borrows one-year money at a low interest rate with the expectation of replacing the loan at the end of the year with a nine-year fixed-rate loan at the then reduced rate.

However there are circumstances where managers find short-term rates deceptively attractive. For example, they might follow a policy of borrowing at short-term rates while the yield curve is still upward sloping, only switching to long-term borrowing when short-term rates rise above long-term rates. Take the case of Rosa plc, which wishes to borrow money for five years and faces the term structure of interest rates shown in the lower line of Figure 18.2. If it issued one-year bonds the rate of return paid would be 7 percent. The returns required on four-year and five-year bonds are 8 percent and 8.3 percent respectively. The company opts for a one-year bond with the expectation of issuing a four-year bond one year later. However by the time the financing has to be replaced, 365 days after the initial borrowing, the entire yield curve has shifted upwards due to general macroeconomic changes. Now Rosa has to pay an interest rate of 10 percent for the remaining four years. This is clearly more expensive than arranging a five-year bond at the outset.

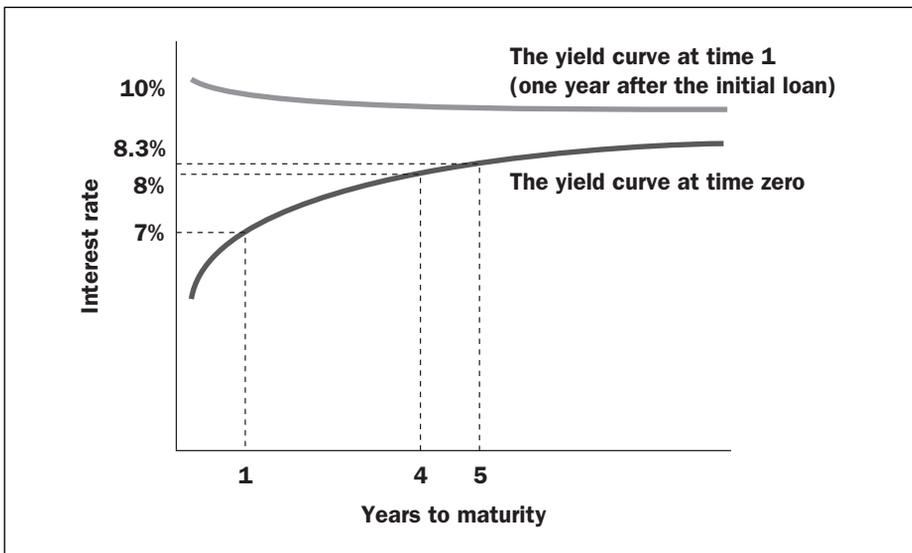
The case of Rosa shows that it can be cheaper to borrow long at low points in the interest rate cycle despite the 'headline' interest charge on long-term debt being greater than on short-term loans.

To 'match' or not to 'match'?

Firms usually come to the conclusion that there is a need for an appropriate mixture of debt finance with regard to length of time to maturity: some short-term borrowing is desirable alongside some long-term borrowing. The major factors which need to be taken into account in achieving the right balance are: (a) cost

FIGURE 18.2

A shifting yield curve affects the relative cost of long- and short-term borrowing – the example of Rosa plc



(interest rate, arrangement fee, etc.) and (b) the risk (of not being able to renew borrowings, of the yield curve shifting, of not being able to meet a sudden out-flow if the maturity is bunched, etc.). Some firms follow the ‘matching’ principle, in which the maturity structure of the finance matches the maturity of the project or asset. Here fixed assets and those current assets which are needed on a permanent basis (for example cash, minimum inventory or debtor levels) are financed through long-term sources, while current assets whose financing needs vary throughout the year are financed by short-term borrowings. Examples of the latter type of asset might be stocks of fireworks at certain times of the year, or investment in inventories of Easter eggs in the spring.

Three types of asset need to be financed:

- fixed assets
- permanent current assets
- fluctuating current assets.

A firm taking the maturity matching approach is considered to be adopting a moderate stance. This is shown in Figure 18.3, where a rising level of total assets is financed principally through increases in long-term finance applied to fixed assets and permanent current assets. The fluctuating current assets, such as those related to seasonal variations, are financed with short-term funds.

A more aggressive approach is represented in Figure 18.4. This entails more risk because of the frequent need to refinance to support permanent current assets as well as fluctuating current assets. If the firm relied on an overdraft for this it will be vulnerable to a rapid withdrawal of that facility. If stocks and cash

FIGURE 18.3
Moderate financing policy stance – the matching principle

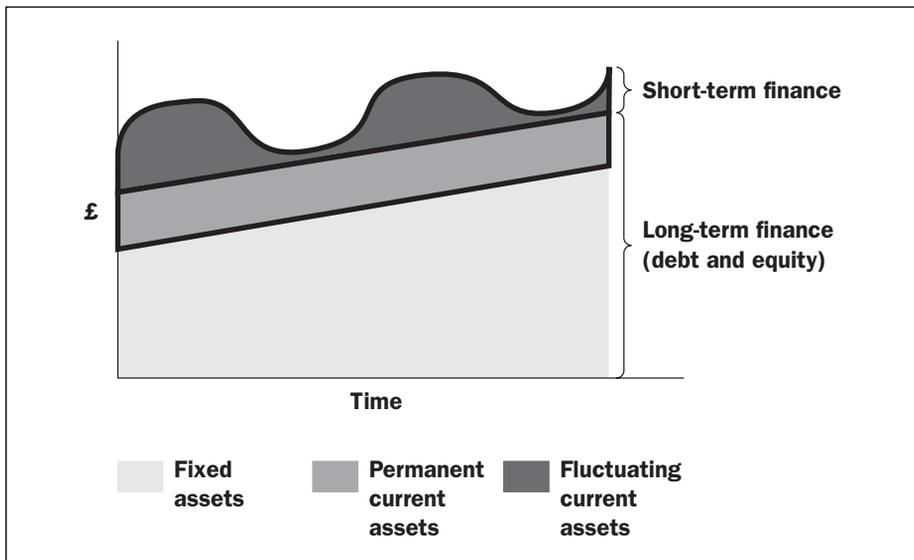
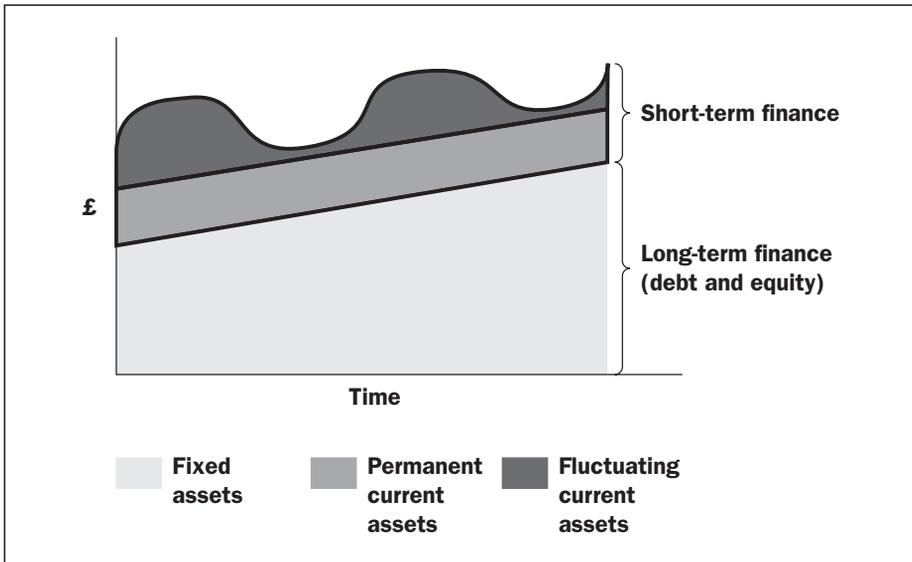


FIGURE 18.4
An aggressive financing policy



are reduced to pay back the overdraft the firm may experience severe disruption, loss of sales and output, and additional costs because of a failure to maintain the minimum required working capital to sustain optimum profitability.

The low-risk policy is to make sure that long-term financing covers the total investment in assets. If there are times of the year when surplus cash is available this will be invested in short-term instruments. This type of policy is shown in Figure 18.5.

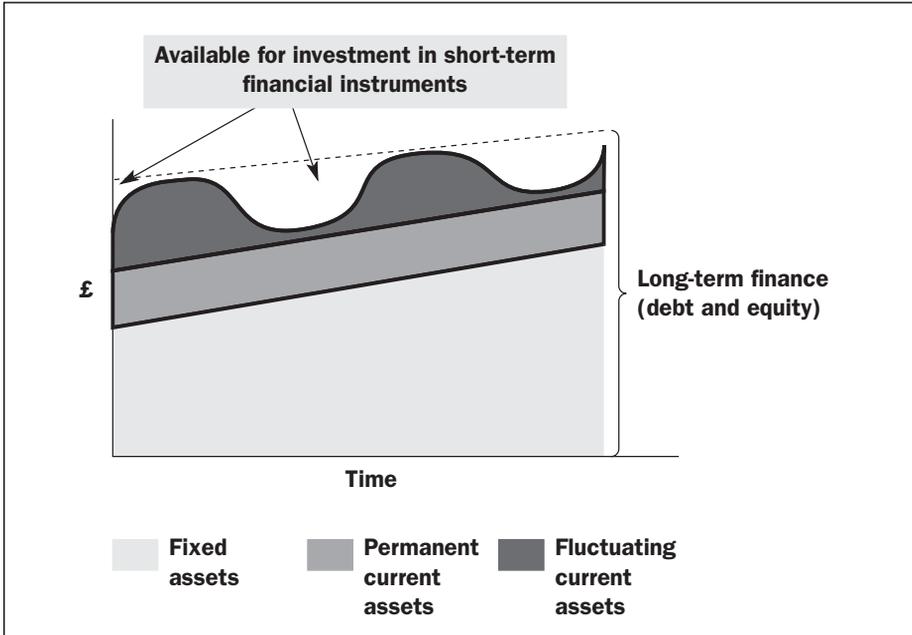
Many managers would feel much happier under the conservative approach because of the lower risk of being unable to pay bills as they arise. However such a policy may not be in the best interests of the owners of the firm. The surplus cash invested in short-term securities is unlikely to earn a satisfactory return relative to the cost of the long-term funds. In all likelihood shareholders would be better off if the firm reduced its long-term financing, by returning cash to shareholders or paying off some long-term loans.

There is no sound theoretical formula to help decide the balance between long- and short-term finance, while many managers follow a policy of matching the maturity of their assets and liabilities, thereby accepting a modest level of risk while avoiding excessive amounts of surplus investible funds, this is far from universally accepted: for example, Microsoft has over \$50bn of cash and short-term investments.

The currency of borrowing

Deciding on the maturity structure of the firm's debt is one aspect of the financing decision. Another is selecting the currency in which to borrow. For

FIGURE 18.5
A conservative financing policy



transnational firms it is common to find borrowing in the currency of the country where the funds are to be invested. This can reduce exposure to foreign exchange rate changes. For example, suppose that Union Jack plc borrows £100m to invest in the USA. It exchanges the £100m into \$150m at the exchange rate of \$1.5 to the pound. The net cash flows in subsequent years are expected to be \$30m per annum. If the exchange rate remained constant Union Jack would therefore receive £20m per year to pay for the financing costs and produce a surplus. However if the rate of exchange moved to \$2 for every pound the annual cash inflow in sterling terms would be merely £15m.² The project is producing £5m less than originally anticipated despite generating the same quantity of dollars, and this is insufficient as a rate of return for Union Jack. The risk attached to this project can be reduced by ensuring that the liabilities are in the same currency as the income flow. So if Union Jack borrows \$150m to invest in the project, even though the exchange rate may move to \$2 : £1 the project remains viable. Currency risk is considered in more detail in Chapter 21.

The interest rate choice

Another consideration for the debt portfolio is the balance to be struck between fixed and floating interest-rate borrowings. In many circumstances it is thought advisable to have a mixture of the two types of borrowing. If all the borrowings are floating rate then the firm is vulnerable to rising interest rates. This often

happens at the most unfortunate times: for example, at the start of recessions interest rates are usually high at the same time as sales are in decline.

Industries with high fixed-cost elements, which need a large volume of sales to maintain profitability, may be particularly averse to floating-rate borrowing as this may add to their cost base and create an additional source of risk. Even if they have to pay more for fixed-rate borrowing initially, the directors may sleep better knowing that one element of risk has been eliminated.

If all borrowing is fixed rate the firm is unable to take advantage of a possible decline in interest rates.

The dangers of gearing

Someone has to decide what is an appropriate level of borrowing for a firm given its equity capital base. This is a difficult decision given the range of positive and negative consequences of increased borrowing. As debt levels rise the firm's earnings attributable to shareholders become increasingly volatile due to the requirement to pay large amounts of interest prior to dividends. Eventually the

The balance between debt and ordinary share capital

In 2001 BT management was in serious trouble. The company had accumulated debt of over £30bn following a worldwide acquisition spree and infrastructure investment. The net assets of the company were roughly half the debt level, at £14bn. The City institutions were desperately concerned by the high level of debt. Sir Peter Bonfield, the chief executive, recognised that he had allowed the debt to rise too high. 'We identified the need to introduce new equity capital into the business to support the reduction in the unsustainable level of group debt' (BT Annual Report 2001). The company raised £5.9bn through a rights issue, sold off property, slashed investment and sold stakes in telecom businesses around the world. It also stopped paying a dividend.

Bristol Water announced plans to return £50m of cash to shareholders as part of a balance sheet restructuring in 2003. The company was valued at only

£90m at the time. 'Bristol Water was overcapitalized and it was time to do something for the shareholders' said John Murray, representative of the largest shareholder.³

Next implemented a share buy back plan for up to 19 per cent of its shares in 2002, following the return of £435m to shareholders through buy-backs in the 2000-2002 period. David Jones, chairman, said the share buy-backs represented the best way to enhance earnings per share.⁴ In the same year Next's high street rival Marks and Spencer announced plans to return £2 billion to shareholders, in 'a move to re-engineer the balance sheet after years of underperformance.'⁵ The retailer said: 'We think we are getting a more efficient balance sheet by increasing debt and reducing equity'. Capita, the outsourcing group announced similar buy-back plans in 2002 'to reduce our cost of capital'.⁶

EXHIBIT 18.1 The balance between debt and ordinary share capital

burden of a large annual interest bill can lead the firm to become financially distressed and, in extreme circumstances, liquidated. If the gearing level is too low, shareholder value opportunities are forgone by not substituting ‘cheap’ debt for equity. Exhibit 18.1 provides some of the evidence that this is a key issue at the heart of senior managerial decision-making.

Debt finance is cheaper and riskier (for the company)

Financing a business through borrowing is cheaper than using equity. This is, first, because lenders require a lower rate of return than ordinary shareholders. Debt financial securities present a lower risk than shares for the finance providers because they have prior claims on annual income and in liquidation. In addition security is often provided and covenants imposed.

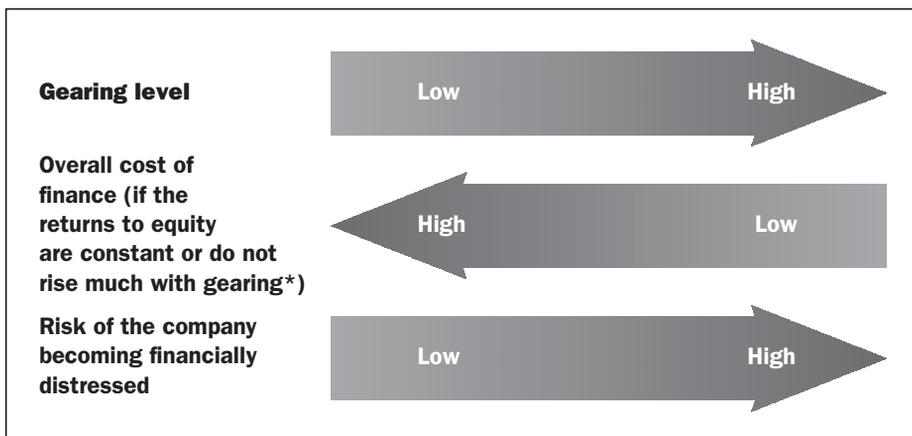
A profitable business effectively pays less for debt capital than equity for another reason: the debt interest can be offset against pre-tax profits before the calculation of the corporation tax bill, thus reducing the tax paid.

Third, issuing and transaction costs associated with raising and servicing debt are generally less than for ordinary shares.

There are some valuable benefits from financing a firm with debt. So why do firms tend to avoid very high gearing levels? One reason is financial distress risk. This could be induced by the requirement to pay interest regardless of the cash flow of the business. If the firm hits a rough patch in its business activities it may have trouble paying its bondholders, bankers and other creditors their entitlement. Figure 18.6 shows that, as gearing increases, the risk of financial failure grows.

Note the crucial assumption in Figure 18.6 – if the returns to equity are constant, or do not rise much, the overall cost of finance declines. This is obviously

FIGURE 18.6
At low gearing levels the risk of financial distress is low, but the cost of capital is high; this reverses at high gearing levels



Note: *This assumption is considered in the text.

unrealistic because as the risk of financial distress rises ordinary shareholders are likely to demand higher returns. This is an important issue and we will return to it after a discussion of some basic concepts about gearing.

If the returns to equity are constant, or do not rise much, the overall cost of finance declines.

What do we mean by gearing?

We need to avoid some confusion possible when using the word 'gearing'. First, we should make a distinction between operating gearing and financial gearing.

Operating gearing refers to the extent to which the firm's total costs are fixed. The profits of firms with high operating gearing, such as car or steel manufacturers, are very sensitive to changes in the sales level. They have high break-even points (the turnover level at which profits are achieved) but when this level is breached a large proportion of any additional sales revenue turns into profit because of the relatively low variable costs.

Financial gearing concerns the proportion of debt in the capital structure. Net income to shareholders in firms with high financial gearing is more sensitive to changes in operating profits.

The terms gearing and leverage are used interchangeably by most practitioners, although leverage is used more in the USA.

There are many different ways of calculating financial gearing (to be called simply 'gearing' throughout this chapter). Financial analysts, the press and corporate managers usually measure gearing by reference to balance sheet (book) figures, but it is important to recognize that much of finance theory concentrates on the market values of debt and equity. Both book and market approaches are useful, depending on the purpose of the analysis.

There are two ways of putting in perspective the levels of debt that a firm carries. *Capital gearing* focusses on the extent to which a firm's total capital is in the form of debt. *Income gearing* is concerned with the proportion of the annual income stream (that is, the pre-interest profits) which is devoted to the prior claims of debt holders, in other words, what proportion of profits is taken by interest charges.

FIGURE 18.7

A firm's financial gearing can be measured in two ways



Capital gearing

There are alternative measures of the extent to which the capital structure consists of debt. One popular approach is the ratio of long-term debt to shareholders' funds (the debt to equity ratio). The long-term debt is usually taken as the balance sheet items 'amounts falling due after more than one year' and shareholders' funds is the net asset (or net worth) figure in the balance sheet.

$$\text{Capital gearing (1)} = \frac{\text{Long-term debt}}{\text{Shareholders' fund}}$$

This ratio is of interest because it may give some indication of the firm's ability to sell assets to repay debts. For example, if the ratio stood at 0.3, or 30 percent, lenders and shareholders might feel relatively comfortable as there would be, apparently, over three times as many net (that is after paying off liabilities) assets as long-term debt. So, if the worst came to the worst, the company could sell assets to satisfy its long-term lenders.

There is a major problem with relying on this measure of gearing. The book value of assets can be quite different from the saleable value. This may be because the assets have been recorded at historical purchase value (perhaps less depreciation) and have not been revalued over time. It may also be due to the fact that companies forced to sell assets to satisfy creditors often have to do so at greatly reduced prices if they are in a hurry.⁷

Second, this measure of gearing can have a range of values from zero to infinity and this makes inter-firm comparisons difficult. The measure shown below puts gearing within a range of zero to 100 percent as debt is expressed as a fraction of all long-term capital.⁸

$$\text{Capital gearing (2)} = \frac{\text{Long-term debt}}{\text{Long-term debt} + \text{Shareholders' funds}}$$

These ratios could be further modified by the inclusion of 'provisions' and deferred taxation. Provisions are sums set aside in the accounts for anticipated loss or expenditure, for example a bad debt or costs of merger integration. Deferred tax likewise may be included as an expected future liability.

The third capital gearing measure, in addition to allowing for long-term debt, includes short-term borrowing.

$$\text{Capital gearing (3)} = \frac{\text{All borrowing}}{\text{All borrowing} + \text{Shareholders' funds}}$$

Many firms rely on overdraft facilities and other short-term borrowing, for example commercial paper. Technically these are classified as short term. In reality many firms use the overdraft and other short-term borrowing as a long-term source of funds. Furthermore, if we are concerned about the potential for financial distress, then we must recognize that an inability to repay an overdraft can be just as serious as an inability to service a long-term bond.

To add sophistication to capital gearing analysis it is often necessary to take into account any cash (or marketable securities) holdings in the firm. These can be used to offset the threat that debt poses.

A measure of gearing which is gaining prominence is the ratio of debt to the total market value of the firm's equity (also called the debt to equity ratio (market value)).

An inability to repay an overdraft can be just as serious as an inability to service a long-term bond.

$$\text{Capital gearing (4)} = \frac{\text{Long-term debt}}{\text{Total market capitalization}}$$

This has the advantage of being closer to the market-value-based gearing measures (assuming book long-term debt is similar to the market value of the debt). It gives some indication of the relative share of the company's total value belonging to debt holders and shareholders.

It is plain that there is a rich variety of capital gearing measures and it is important to know which measure people are using – it can be very easy to find yourself talking at cross-purposes.⁹

Income gearing

The capital gearing measures rely on the appropriate valuation of net assets either in the balance sheet or in a revaluation exercise. This is a notoriously difficult task to complete with any great certainty. Try valuing a machine on a factory floor, or a crate of raw material. Also the capital gearing measures focus on a worst case scenario: 'What could we sell the business assets for if we had to, in order to pay creditors?'

It may be erroneous to focus exclusively on assets when trying to judge a company's ability to repay debts. Take the example of a successful advertising agency. It may not have any saleable assets at all, apart from a few desks and chairs, and yet it may be able to borrow hundreds of millions of pounds because it has the ability to generate cash to make interest payments. Thus, quite often, a more appropriate measure of gearing is one concerned with the level of a firm's income relative to its interest commitments:

$$\text{Interest cover} = \frac{\text{Profit before interest and taxes}}{\text{Interest charges}}$$

The lower the interest cover ratio the greater the chance of interest payment default and liquidation. The inverse of interest cover measures the proportion of profits paid out in interest – this is called income gearing.

Table 18.1 presents an extract from a report designed to assist managers. It gives some idea of the typical gearing ratios for medium-sized firms (turnover £1m–£50m) in Britain's East and West Midlands regions. This draws on data from over 1,200 firms and provides average figures for a ten-year period.

TABLE 18.1
Solvency/liquidity averages

	Quick ratio		Total debt/ Net worth (%)		Long-term debt/Net worth (%)		Interest/Pre- interest profit (%)	
	East Mids	West Mids	East Mids	West Mids	East Mids	West Mids	East Mids	West Mids
Chemicals	2.24	1.00	140	67	137	24	28	23
Metal goods	1.08	1.00	90	175	40	70	19	27
Mechanical engineering	1.08	0.94	76	145	28	55	18	29
Electrical and electronic engineering	0.87	0.90	118	186	35	83	27	20
Rubber and plastics	0.86	0.85	131	108	45	37	30	36
Textiles	0.85	0.80	131	86	51	23	38	28
Footwear and clothing	1.00	0.66	89	80	21	15	24	42
Food, drink and tobacco	0.95	0.67	76	164	32	34	33	29
Paper, print and publishing	0.96	1.05	109	84	63	30	29	24
Construction	0.78	0.88	75	81	23	18	23	20
Wholesale distribution	0.89	0.79	145	206	27	32	33	38
Retail distribution	0.56	0.54	158	132	40	26	51	40
Business services	1.06	1.09	125	166	40	98	24	19

Solvency and liquidity ratios

Quick ratio (acid test) is the ratio of current assets less stock to total current liabilities. It measures the extent to which short-term assets are adequate to settle short-term liabilities. The stock figure is excluded on the grounds that stock may take several months to turn into cash.

Total debt/Net worth as a ratio expresses total debt (formal long- and short-term loans) as a percentage of net worth (a measure of shareholders' funds). It shows the extent to which lenders have financed the firm's assets. It is often called the borrowing ratio.

Long-term debt/Net worth expresses long-term debt as a percentage of net worth (shareholders' funds). It is a narrower measure of gearing than the total debt/net worth ratio. By comparing the two ratios, it is possible to establish the relative proportions of long-term and short-term debt. Relying too heavily on short-term debt can lead to difficulties. For example, bank overdrafts can be recalled at very short notice.

Interest/Pre-interest profit expresses gross interest payable as a percentage of pre-interest and pre-tax profit. It gives an indication of ability to cover interest payments. The greater the proportion of profits that have to be paid out in interest payments, the riskier the firm's position. A ratio of 100 percent means that all pre-interest profit is used to pay interest to lenders, leaving nothing to add to shareholder wealth. The inverse of this ratio is known as 'Interest cover'.

Source: Arnold, G.C. and Davis, P. (1995) *Profitability Trends in West Midlands Industries*, Lloyds Bowmaker Corporate Finance. Reprinted with permission of Lloyds UDT Limited.

The Lex column of the *Financial Times* commented on the most appropriate measures of gearing for modern industry (see Exhibit 18.2).

Goodbye gearing

Investors have long used balance-sheet gearing as the main yardstick of a company's indebtedness. In the past, this was appropriate as the balance sheet offered a reasonable guide to a company's value. But balance sheets are now scarcely relevant as a measure of corporate worth. As the world economy shifts from manufacturing to services, value is increasingly the product of human brains. Companies like Microsoft, Disney and Marks & Spencer owe their success to intellectual property, media creations and brands. Unlike physical property or machines, such products of the mind do not typically appear on balance sheets. Even in manufacturing, inflation and arbitrary depreciation policies make balance sheets a misleading guide to value.

If balance-sheet gearing is no longer useful, what yardsticks should be

employed instead? One option is to look at interest cover – either operating profit or operating cash flow divided by interest payments. Such ratios measure how easy it is for companies to service their debts. Different levels of interest cover are appropriate for different types of company; clearly, cyclicals need higher ratios than utilities.

Another option is to divide a company's debt by its market capitalization. Market capitalization overcomes the inadequacies of balance-sheet measures of equity. But in other ways this ratio is similar to traditional gearing: a higher figure means shareholders' returns are more leveraged to the enterprise's underlying performance and so more risky. In future, debt/market capitalization and interest cover will be Lex's preferred yardsticks.

EXHIBIT 18.2 Goodbye gearing

Source: *Financial Times* 9 October 1995

The effect of gearing

The introduction of interest-bearing debt 'gears up' the returns to shareholders. Compared with those of the ungeared firm the geared firm's returns to its owners are subject to greater variation than underlying earnings. If profits are high, the geared firm's shareholders will experience a more than proportional boost in their returns compared to the ungeared firm's shareholders. If profits turn out to be low the geared firm's shareholders will find their returns declining to an exaggerated extent.

The effect of gearing can best be explained through an example. Harby plc is shortly to be established. The prospective directors are considering three different capital structures which will all result in £10m of capital being raised.

- 1 All equity – 10 million shares sold at a nominal value of £1.
- 2 £3m debt (carrying 10 percent interest) and £7m equity.
- 3 £5m debt (carrying 10 percent interest) and £5m equity.

To simplify their analysis the directors have assigned probabilities to three potential future performance levels (see Table 18.2).

TABLE 18.2
Probabilities of performance levels

Customer response to firm's products	Income before interest*	Probability (%)
Modest success	£0.5m	20
Good response	£3.0m	60
Run-away success	£4.0m	20

* Taxes are to be ignored.

We can now examine what will happen to shareholder returns for each of the gearing levels.

Note, in Table 18.3, what happens as gearing increases: the changes in earnings attributable to shareholders is magnified. For example, when earnings before interest rise by 500 percent from £0.5m to £3.0m the returns on the 30 percent geared structure rises by 1,200 per cent from 3 percent to 39 percent. This magnification effect works in both positive and negative directions – if earnings before interest are only £0.5m the all-equity structure gives shareholders some return, but with the 50 percent geared firm they will receive nothing. Harby's shareholders would be taking a substantial risk that they would have no profits if they opted for a high level of gearing.

TABLE 18.3
The effect of gearing

Customer response	Modest	Good	Run-away
Earnings before interest	£0.5m	£3.0m	£4.0m
<i>All-equity structure</i>			
Debt interest at 10%	0.0	0.0	0.0
Earnings available for shareholders	£0.5m	£3.0m	£4.0m
Return on shares	$\frac{£0.5m}{£10m} = 5\%$	$\frac{£3.0m}{£10m} = 30\%$	$\frac{£4.0m}{£10m} = 40\%$
<i>30% gearing (£3m debt, £7m equity)</i>			
Debt interest at 10%	£0.3m	£0.3m	£0.3m
Earnings available for shareholders	£0.2m	£2.7m	£3.7m
Return on shares	$\frac{£0.2m}{£7m} = 3\%$	$\frac{£2.7m}{£7m} = 39\%$	$\frac{£3.7m}{£17m} = 53\%$
<i>50% gearing (£5m debt, £5m equity)</i>			
Debt interest at 10%	£0.5m	£0.5m	£0.5m
Earnings available for shareholders	0.0	£2.5m	£3.5m
Return on shares	$\frac{£0.0m}{£5m} = 0\%$	$\frac{£2.5m}{£5m} = 50\%$	$\frac{£3.5m}{£5m} = 70\%$

As the gearing levels rise for Harby, the expected return to shareholders (weighted average of the possible outcomes) also rises, but this is accompanied by a rising level of risk. Management need to weigh up the relative importance of the 'good' resulting from the increase in expected returns and the 'bad' from the wider dispersion of returns attributable to shareholders.

Business risk and financial risk

Business risk is the variability of the firm's operating income, that is, the income before interest. In the case of Harby this is found by examining the dispersion of returns for the all-equity capital structure. This dispersion is caused purely by business-related factors, such as the characteristics of the industry and the competitive advantage possessed by the firm within that industry. This risk will be influenced by factors such as the variability of sales volumes or prices over the business cycle, the variability of input costs, the degree of market power and the level of growth.

The business risk of a monopoly supplier of electricity, gas or water is likely to be significantly less than that for, say, an entrepreneurial company trying to gain a toehold in the internet optical switch market. The range of possible demand levels and prices is likely to be less for the utilities than for the hi-tech firm. Business risk is determined by general business and economic conditions and is not related to the firm's financial structure.

Financial risk is the additional variability in returns to shareholders that arises because the financial structure contains debt.

Table 18.3 implies that firms with low business risk can take on relatively high levels of financial risk without exposing their shareholders to excessive total risk. The increased expected return more than compensates for the higher variability resulting in climbing share prices.

Financial distress

A major disadvantage for a firm taking on higher levels of debt is that it increases the risk of financial distress, and ultimately liquidation. This may have a detrimental effect on both the equity holders and the debt holders.

Financial distress: where obligations to creditors are not met or are met with difficulty.

The risk of incurring the costs of financial distress has a negative effect on a firm's value, which offsets the value of tax relief of increasing debt levels – see Chapter 10 for a discussion of the 'tax shield' effect of debt. These costs become considerable with very high gearing. Even if a firm manages to avoid liquidation its relationships with suppliers, customers, employees and creditors may be seriously damaged. Suppliers providing goods and services on credit are

likely to reduce the generosity of their terms, or even stop supplying altogether, if they believe that there is an increased chance of the firm not being in existence in a few months' time. The situation may be similar with customers. Many customers expect to develop close relationships with their suppliers, and plan their own production on the assumption of a continuance of that relationship. If there is any doubt about the longevity of a firm it will not be able to secure high-quality contracts. For example, car assembly companies develop close relationships with component suppliers – the car producers will not make that effort if there is a doubt about the financial stability of a supplier. In the consumer markets customers often need assurance that firms are sufficiently stable to deliver on promises, for example package holiday companies taking bookings six months in advance. When NTL, the cable company, went through a financial reconstruction because it was heavily borrowed and unable to service its debts in 2002, it lost more than 800 customers a day. Not only were existing customers doubtful about the continuation of the company but the shortage of cash meant a cut in advertising and other expenditure on winning new customers. Employees may become demotivated in a struggling firm as they sense increased job insecurity and few prospects for advancement. The best staff will start to move to posts in safer companies. Bankers and other lenders will tend to look upon a request for further finance from a financially distressed company with a prejudiced eye – taking a safety-first approach – and this can continue for many years after the crisis has passed. They may also insist on restriction on managerial freedom of action. In 2003, for example, Waterford Wedgewood was told by its bankers to reduce stock levels, to undertake no further capital expenditure other than what was already under way, to issue a high-yield bond to replace some of the bank debt, and to not pay an interim dividend. Management find that much of their time is spent 'fire fighting' – dealing with day-to-day liquidity problems – and focussing on short-term cash flow rather than long-term shareholder wealth. Often companies are forced to sell off their most profitable operations in a desperate attempt to raise cash. For instance, in 2003 Fiat put up for sale its most valuable businesses (eg. Fiat Avio) to raise enough cash to allow it to continue producing cars.

The indirect costs associated with financial distress can be much more significant than the more obvious direct costs such as paying for lawyers and accountants and for refinancing programs. Some of these indirect and direct costs are shown in Table 18.4.

As the risk of financial distress rises with the gearing ratio shareholders (and lenders) demand an increasing return in compensation. The important issue is at what point does the probability of financial distress so increase the cost of equity and debt that it outweighs the benefit of the tax relief on debt? Figure 18.8 shows that there is an optimal level of gearing. At low levels of debt the major influence on the overall cost of capital (the WACC – weighted average cost of capital) is the cheaper after-tax cost of debt. As gearing rises investors become more concerned about the risk of financial distress and therefore the

TABLE 18.4
Costs of financial distress

Indirect examples	Direct examples
Uncertainties in customers' minds about dealing with this firm – lost sales, lost profits, lost goodwill.	Lawyers' fees.
Uncertainties in suppliers' minds about dealing with this firm – lost inputs, more expensive trading terms.	Accountants' fees.
If assets have to be sold quickly the price may be very low.	Court fees.
Delays, legal impositions, and the tangles of financial reorganization may place restrictions on management action, interfering with the efficient running of the business.	Management time.
Management may give excessive emphasis to short-term liquidity, e.g. cut R&D and training, reduce trade credit and stock levels.	
Temptation to sell healthy businesses as this will raise the most cash.	
Loss of staff morale, tendency to examine possible alternative employment.	
To conserve cash, lower credit terms are offered to customers, which impacts on the marketing effort.	

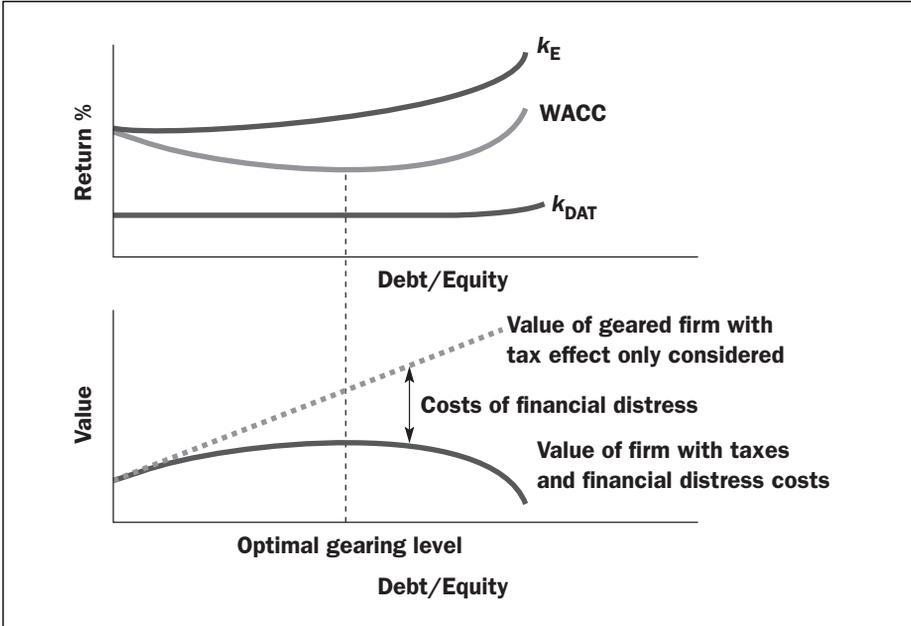
required rates of return rise. The fear of loss factor becomes of overriding importance at high gearing levels. (There is more on this relationship in Chapter 10.)

Some factors influencing the risk of financial distress costs

The susceptibility to financial distress varies from company to company. Here are some influences:

- *The sensitivity of the company's revenues to the general level of economic activity* If a company is highly responsive to the ups and downs in the economy, shareholders and lenders may perceive a greater risk of liquidation and/or distress and demand a higher return in compensation for gearing compared with that demanded for a firm which is less sensitive to economic events.
- *The proportion of fixed to variable costs* A firm that is highly operationally geared, and which also takes on high borrowing, may find that equity and debt holders demand a high return for the increased risk.
- *The liquidity and marketability of the firm's assets* Some firms invest in a type of asset which can be easily sold at a reasonably high and certain value should they go into liquidation. This is of benefit to the financial security holders and so they may not demand such a high risk premium. A hotel chain, for example, should it suffer a decline in profitability, can usu-

FIGURE 18.8
The cost of capital and the value of the firm with taxes and financial distress, as gearing increases



ally sell hotels in a reasonably active property market. Investors in an advertising agency, with few saleable assets, would be less sanguine about rises in gearing.

- *The cash-generative ability of the business* Some firms produce a high regular flow of cash and so can reasonably accept a higher gearing level than a firm with lumpy and delayed cash inflows.

Table 18.5 illustrates that the optimal gearing level for firms shifts depending on key characteristics of the underlying business.

Exhibit 18.3 shows two companies with bombed-out share prices, in part due to excessive borrowing to speculate on mobile telecommunication. High-risk ventures with very uncertain cash flows should be financed with a high proportion of equity capital rather than debt.

TABLE 18.5

The characteristics of the underlying business influences the risk of liquidation/distress, and therefore WACC, and the optimal gearing level

Characteristic	Food retailer	Steel producer
Sensitivity to economic activity	Relatively insensitive to economic fluctuations	Dependent on general economic prosperity
Operational gearing	Most costs are variable	Most costs are fixed
Asset liquidity	Shops, stock, etc., easily sold	Assets have few/no alternative uses. Thin secondhand market
Cash-generative ability	High or stable cash flow	Irregular cash flow
Likely acceptable gearing ratio	HIGH	LOW

Debt troubles dog European telecom giants

Aline van Duyn

There may be many differences between France Telecom and Deutsche Telekom, but the two operators have one crucial similarity – neither has tackled the debt mountains built up through acquisitions and expensive third-generation mobile phone licences in Europe.

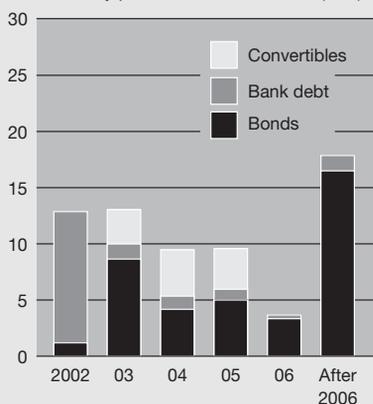
By now, their debts should have been falling. Instead, they have risen and could increase further, not least from a mounting interest bill. The burden is

heavy and shares in both companies are touching all-time lows.

‘France Telecom and Deutsche Telekom are the only operators that have not yet resolved their debt problems,’ says Laura Winchester, telecommunications analyst at Barclays Capital. ‘There is a feeling in the market that both may need to do something to prevent things getting worse.’

France Telecom

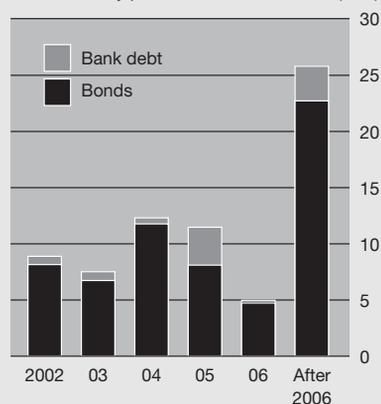
Debt maturity profile as of Dec 31 2001 (€bn)



Source: Barclays Capital

Deutsche Telekom

Debt maturity profile as of Mar 31 2002* (€bn)



*Pro forma based on Q1 2002 new issuance and change in cash balance

At the end of last year, France Telecom had net debt of €60.7bn (\$39bn); now it is closer to €67bn. Deutsche Telekom had net debt of €63.5bn in December, which hit €67.3bn by the end of March.

Both companies face increases in their borrowings as they are forced to honour agreements to buy shares in subsidiaries or partners. Meanwhile, weak equity markets mean that plans to sell assets have been put on hold.

The uncertainty is reflected in the credit ratings of the two operators, with more pressure on the French operator.

Both companies are rated Baa1 by Moody's Investors Service and BBB+ by Standard & Poor's. Deutsche Telekom has a negative outlook from Moody's. However, France Telecom is on review for further downgrades, with Moody's having indicated it might cut its ratings by up to two notches, bringing it to the investment grade threshold. A decision is expected in the coming weeks.

Though many analysts expect France Telecom's ratings to remain

investment grade, because the French government owns 55 per cent of the company, it could still face liquidity problems. It has €13bn of debt maturing this year and next, including €12bn in the bond markets. This could be an expensive exercise.

France Telecom has said that, in the worst case, its net debt would stand at €58.3bn by the end of next year. But many analysts disagree with that forecast.

Duncan Warwick-Champion, telecoms credit analyst at UBS Warburg, estimates its debt will be €69.3bn at the end of 2003. Mr Warwick-Champion, previously an analyst at S&P, says year-end debt was €63.2bn and not the €60.7bn reported, because the leasing of real estate should be included. He also forecasts lower returns from the sale of stock, the Italian unit Wind and property disposals. 'Only the announcement of a significant rights issue is likely to stop the ratings agencies lowering France Telecom's ratings,' he says.

EXHIBIT 18.3 Debt troubles dog European telecom giants

Source: *Financial Times* 14 June 2002

Agency costs

Another restraining influence on the decision to take on high debt is the agency cost of doing so. Agency costs arise out of what is known as the 'principal-agent' problem. In most large firms the finance providers (principals) are not able to actively manage the firm. They employ 'agents' (managers) and it is possible for these agents to act in ways that are not always in the best interests of the equity or debt holders.

Costs of preventing agents (e.g. managers) pursuing their own interests at the expense of their principals (e.g. shareholders). Examples include contracting costs and costs of monitoring. In addition, there is the agency cost of the loss of wealth caused by the extent to which prevention measures have not worked and managers continue to pursue non-shareholder wealth goals.

If management are acting for the maximization of shareholder wealth debt holders may have reason to fear agency problems, because there may be actions that potentially benefit the owners at the expense of lenders. It is possible for

lenders to be fooled or misled by managers. For example, management might raise money from bondholders saying that this is low-risk lending (and therefore paying a low interest rate) because the firm has low gearing and the funds will be used for a low-risk project. In the event the managers invest in high-risk ventures, and the firm becomes more highly geared by borrowing more. As a result the original lenders do not receive a return sufficient for the level of risk and the firm has the benefit of low-interest financing.

Alternatively, consider a firm already in financial distress. From the shareholders' point of view there is little to lose from taking an enormous gamble by accepting very high-risk projects. If the gamble pays off the shareholders will win but the debt holders will gain no more than the obligated fixed interest. If it fails, the shareholders are no worse off but the lenders experience default on their securities.

The problem boils down to one of *information asymmetry* – that is, the managers are in possession of knowledge unavailable to the debt providers. One of the solutions is to spend money on monitoring. The lenders will require a premium on the debt interest to compensate for this additional cost. Also restrictions (covenants) are usually built into a lending agreement. For example, there may be limits on the level of dividends so that shareholders do not strip the company of cash. There may be limits placed on the overall level of indebtedness, with precise capital and income-gearing ratios. Managers may be restricted in the disposal of major assets or constrained in the type of activity they may engage in.

Extensive covenants imposed by lenders can be costly for shareholders because they reduce the firm's operating freedom and investment flexibility. Projects with a high NPV may be forgone because of the cautiousness of lenders. The opportunity costs can be especially frustrating for firms with high growth potential.

Thus agency costs include monitoring costs passed on as higher interest rates and the loss of value caused by the inhibition of managerial freedom to act. These increase with gearing, raising the implicit cost of debt and lowering the firm's value.

There may also be a psychological element related to agency costs; managers generally do not like restrictions placed on their freedom of action. They try to limit constraints by not raising a large proportion of capital from lenders. This may help to explain why, in practice, we find companies generally have modest gearing levels.

Borrowing capacity

Borrowing capacity has a close connection with agency costs. Lenders prefer secured lending, and this often sets an upper limit on gearing. They like to have the assurance that if the worst happened and the firm was unable to meet its interest obligations they could seize assets to sell off so that loans could be repaid. Thus, high levels of gearing are unusual because companies run out of suitable assets to offer as security against loans. So, the gearing level may not be determined by a theoretical, informed and considered management decision, but by the limits to total borrowing imposed by lenders.

Firms with assets which have an active secondhand market, and which do not tend to depreciate, such as property, are likely to have a higher borrowing capacity than firms that invest in assets with few alternative uses.

Pecking order

There is a 'pecking order' for financing. Firms prefer to finance with internally generated funds. If a firm has potentially profitable investments it will first of all try to finance the investments by using the store of previous years' profits, that is, retained earnings. If still more funds are needed, firms will go to the capital markets. However, the debt market is called on first, and only as a last resort will companies raise equity finance. Myers (1984, p. 581) puts it this way: 'In this story, there is no well-defined target debt–equity mix, because there are two kinds of equity, internal and external, one at the top of the pecking order and one at the bottom.'

One reason for placing new issues of equity at the bottom is supposedly that the stock markets perceive an equity issue as a sign of problems – an act of desperation. Bennett Stewart (1990, p. 391) puts it: 'Raising equity conveys doubt. Investors suspect that management is attempting to shore up the firm's financial resources for rough times ahead by selling over-valued shares.' The pecking order idea helps to explain why the most profitable companies often borrow very little. It is not that they have a low target debt ratio, but because they do not need outside finance. If they are highly profitable they will use these profits for growth opportunities and so end up with very little debt and no need to issue shares.

Less profitable firms with an extensive investment program issue debt because they do not have internal funds sufficient for their capital investment program and because debt is first in the pecking order of externally raised finance.

There is an argument that firms do not try to reach the 'correct' capital structure as dictated by theory, because managers are following a line of least resistance. Internal funds are the first choice because using retained earnings does not involve contact with outside investors. This avoids the discipline involved in trying to extract investors' money. For example, the communication process required to raise equity finance is usually time consuming and onerous, with a formal prospectus, etc., and investors will scrutinize the detailed justifications advanced for the need to raise additional finance. It seems reasonable to suppose that managers will feel more comfortable using funds they already have in their hands. However, if they do have to obtain external financing then debt is next in the line of least resistance. This is because the degree of questioning and publicity associated with a bank loan or bond issue is usually significantly less than that associated with a share issue.

Another reason for a pecking order is that ordinary shares are more expensive to issue than debt capital, which in turn is more expensive than simply applying previously generated profits. The costs of new issues and rights issues of shares can be very expensive, whereas retained earnings are available without transaction costs.

Exhibit 18.4 shows that rights issues (particularly 'rescue' rights issues designed to save the company from the danger of liquidation) can be viewed in a very negative light by the financial markets.

Companies go back to basics in search for cash

Arkady Ostrovsky

Two French groups yesterday joined the lengthening queue of cash-hungry European companies lining up to raise money from shareholders through rights issues.

Scor, the reinsurer, plans a capital increase of €400m (£251.2m) – equivalent to its market capitalisation – but the move was poorly received and the company's shares tumbled by a third. Meanwhile, Bouygues Telecom said it was looking to launch a rights issue to pay for its €619m licence to operate a third-generation mobile phone network.

Rights issues, offerings of new shares to existing shareholders on a pro-rata basis to their holdings – have been the most popular way for companies to raise money this year. Shareholders can either subscribe to a rights issue or reject it, depending on their view of the company's future. But when stock markets are tumbling and other sources of financing have dried up, it can be a life-and-death choice for a company.

'For a number of highly geared companies, bond markets have been, in effect, shut this year, the IPO market is dry and banks are reluctant to lend long-term money to indebted companies, so companies have no choice but to ask shareholders for money,' says James Renwick, European head of

equity capital markets at UBS Warburg.

'Rights issues are the most basic way of raising money, which companies undertook before capital markets were properly developed. But when times get tough, companies go back to basics,' says Dante Roscini, global co-head of equity capital markets at Merrill Lynch.

Insurers, whose investment portfolios have been hit by stock market falls, and telecommunications companies, many of which are struggling under a debt mountain, are leading the way.

Those that have raised money include Ericsson, Sonera, Zurich Financial Services and Legal & General.

'European companies are facing up to reality. Volatility is at record high levels and a rescue rights issue is likely to be the only way of restructuring balance sheets in the short to medium term,' says Mr Renwick.

Not all rights issues are rescue financing, however. Kingfisher, the UK retailer, and Imperial Tobacco, used them to help pay for acquisitions.

There is little doubt that a rising level of rights issues is a sign of desperation on the part of many companies. But it is also the first step towards balance sheet restructurings and the reducing of debt, which, ultimately, should lead to the revival of equity capital markets.

EXHIBIT 18.4 Companies go back to basics in search for cash

Source: *Financial Times* 1 October 2002

Financial slack

Operating and strategic decisions are generally the prime determinants of company value, not the financing decision. Being able to respond to opportunities as they fleetingly appear in business is important. If a firm is already highly geared it may find it difficult to gain access to more funds quickly as the need arises. Financial slack means having cash (or near-cash) and/or spare debt capacity. This slack can be extremely valuable and firms may

Financial slack means having cash (or near-cash) and/or spare debt capacity.

restrict debt levels below that of the 'optimal' gearing level in order that the risk of missing profitable investments is reduced.

Financial slack is also valuable for meeting unforeseen circumstances. Managers may wish to be cautious and have a reserve of cash or spare borrowing capacity to cope with a 'rainy day'.

Signaling

Managers and other employees often have a very powerful incentive to ensure the continuance of the business. They are usually the people who suffer most should it become insolvent. Because of this, it is argued, managers will generally increase the gearing level only if they are confident about the future. Shareholders are interested in obtaining information about the company's prospects, and changes in financing can become a signal representing management's assessment of future returns. Ross (1977) suggests that an increase in gearing should lead to a rise in share price as managers are signaling their increased optimism. Managers, therefore, need to consider the signal transmitted to the market concerning future income whenever it announces major gearing changes.

Control

The source of finance chosen may be determined by the effect on the control of the organization. For example, if a shareholder with 50 percent of a company's shares is unable to pay for more shares in a rights issue, he or she may be reluctant to allow the company to raise funds in this way, especially if shares are sold to a rival. This limits the range of sources of finance and may lead to a rise in debt levels.

Some further thoughts on debt finance

There are some intriguing ideas advanced to promote the greater use of debt in firms' capital structure. Three of them will be considered here.

Motivation

High debt will motivate managers to perform better and in the interests of shareholders. Consider this thought: if an entrepreneur (an owner-manager) wishes to raise finance for expansion purposes, debt finance is regarded as the better choice from the perspective of entrepreneurs and society. The logic works like this: if new shares are sold to outside investors, this will dilute the entrepreneur's control and thus the level of interest of the entrepreneur in the success of the business. The firm will be run less efficiently because of reduced effort by the key person.

Or consider this argument: Bennett Stewart argues that in firms without a dominant shareholder and with a diffuse shareholder base, a recapitalization which substitutes debt for equity can result in the concentration of the shares in the hands of a smaller, more proactive group. These shareholders have a greater incentive to monitor the firm. (If managers are made part of this shareholder owning group there is likely to be a greater alignment of shareholder and managers' interests.) Large quoted firms often have tens of thousands of shareholders, any one of whom has little incentive to go to the expense of opposing managerial action detrimental to shareholders' interests – the costs of rallying and co-ordinating investors often outweigh the benefits to the individuals involved. However, if the shareholder base is shrunk through the substitution of debt for equity, the remaining shareholders would have greater incentive to act against mismanagement. An extreme form of this switch to concentration is when a management team purchases a company through a leveraged buyout or buy-in. Here a dispersed, divided and effectively powerless group of shareholders is replaced with a focussed and knowledgeable small team, capable of rapid action and highly motivated to ensure the firm's success.

Reinvestment risk

High debt forces the firm to make regular payments to debt holders, thereby denying 'spare' cash to the managers. In this way the firm avoids placing a temptation in the manager's path, which might lead to investment in negative NPV projects and to making destructive acquisitions. Deliberately keeping managers short of cash avoids the problem that shareholders' funds may be applied to projects with little thought to returns. If funds are needed, instead of drawing on a large pot held within the firm, managers have to ask debt and equity finance providers. This will help to ensure that their plans are subject to the scrutiny and discipline of the market.

The problem of managers over-supplied with money, given the limited profitable investment opportunities open to them, seems to be widespread, but specific examples are only clearly seen with hindsight. For example, in the 1990s GEC was a cash rich company under Arnold Weinstock. New managers changed the name to Marconi and spent billions buying high technology communication infrastructure companies working at the cutting-edge, but with little in the way of certainty over the likely future demand for the services/goods they offered – hope of a glorious future was all that was needed for the spending of the large pot of money as well as additional borrowings. When demand projections were shown to be hopelessly optimistic the company barely survived – shareholder value was destroyed on a massive scale.

Hope of a glorious future was all that was needed for the spending of the large pot of money.

The danger of poor investment decisions is at its worst in firms that are highly profitable but which have few growth opportunities. The annual surplus cash flow is often squandered on increasingly marginal projects within existing SBUs

or wasted in a diversification effort looking to buy growth opportunities: unfortunately these often cost more than they are worth. It is far better, say Stewart (1990), Hart (1995), Jensen (1986) and others, that managers are forced to justify the use of funds by having to ask for it at regular intervals. This process can be assisted by having high debt levels which absorb surplus cash through interest and principal payments and deposit it out of the reach of empire-building, perk-promoting, lazy managers.

Operating and strategic efficiency

‘Equity is soft; debt is hard. Equity is forgiving; debt is insistent. Equity is a pillow; debt is a dagger.’ This statement by Bennett Stewart (1990, p. 580) emphasizes that operating and strategic problems and inefficiencies are less

Equity is soft; debt is hard.

likely to be attended to and corrected with a capital base that is primarily equity. However, the managers of a highly geared company are more likely to be attuned to the threat posed by falling efficiency and profitability. The failing is the same under both a high equity and a high debt structure: it just seems more of a crisis when there is a large interest bill each month. The geared firm, it is argued, simply cannot afford to have any value-destructive activities (SBUs or product lines). Managers are spurred on by the pressing need to make regular payments, to reform, dispose or close – and quickly.

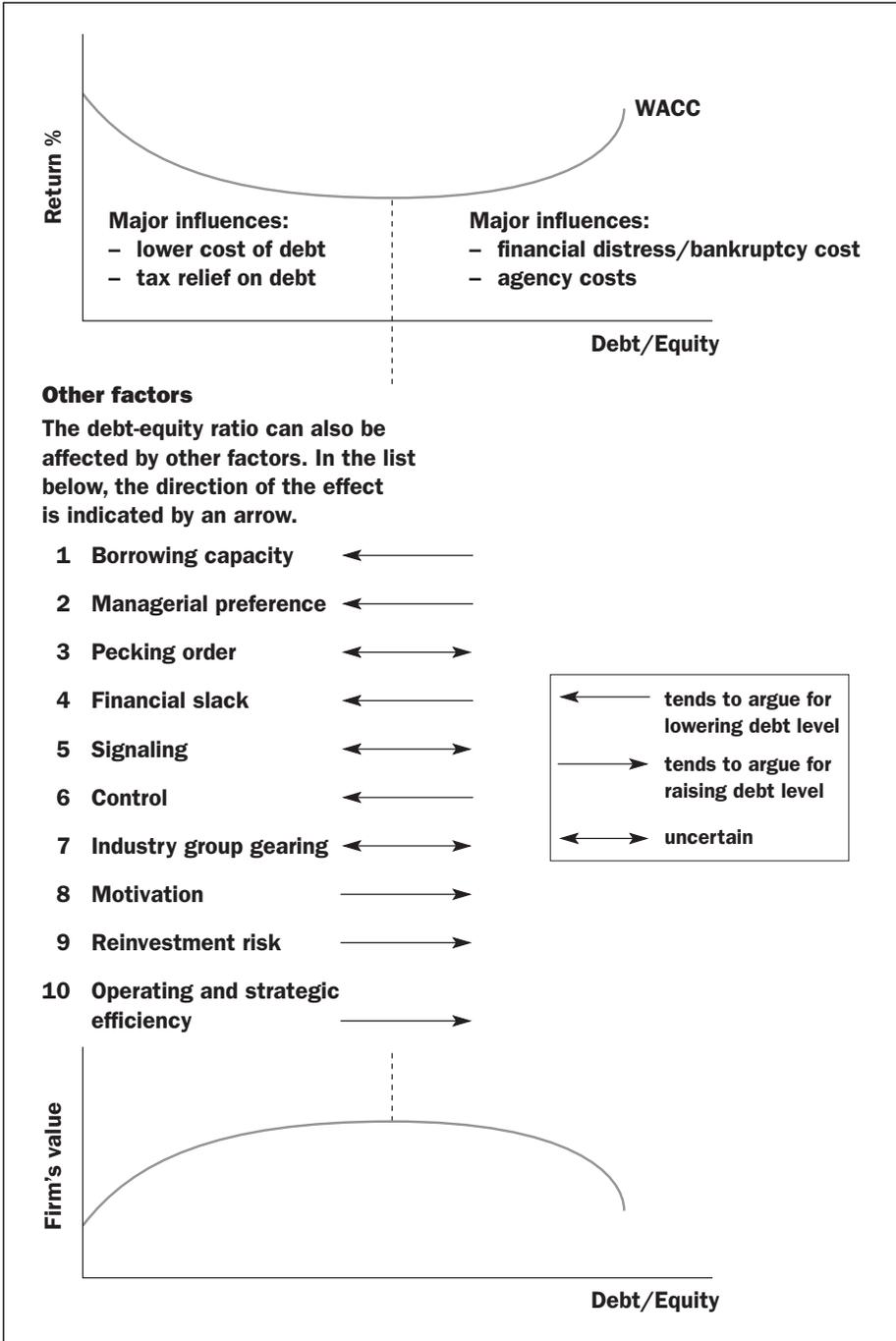
These are some of the arguments put forward, particularly in the USA in the era of massive leveraged buyouts (LBOs), junk bonds and share repurchase programs (in the 1980s and 1990s), in support of high debt. They seem to make some sense, but the downside of excessive debt must be balanced against these forcefully advanced ideas. Turning back to Table 18.4, which shows the costs of financial distress, can help to give some perspective. In addition, many firms have found themselves crippled and at a competitive disadvantage because of the burden of high debt – e.g. Marconi is a shadow of its former self, as is Cable and Wireless and Vivende Universal.

Rounding up the capital structure arguments

The proportion of debt in the total capital of a firm can influence the overall cost of capital and therefore the value of the firm and the wealth of shareholders. If, as a result of increasing the gearing ratio, it is possible to lower the weighted average cost of capital, then all the future net cash flows will be discounted at a lower rate. It is generally observed that as gearing increases, the WACC declines because of the lower cost of debt. This is further enhanced by the tax relief available on debt capital.

FIGURE 18.9

The weighted average cost of capital is U-shaped and value can be altered by changing the gearing level



But as gearing rises the risk of financial distress causes shareholders (and eventually debt holders) to demand a greater return. This eventually rises to such an extent that it outweighs the benefit of the lower cost of debt, and the WACC starts to rise. This risk factor is difficult, if not impossible, to quantify and therefore the exact position and shape of the WACC curve for each firm remains largely unknown. Nevertheless, it seems reasonable to postulate there is a U-shaped relationship like that shown in Figure 18.9.

We cannot scientifically establish a best debt–equity ratio. There are many complicating factors that determine the actual gearing levels adopted by firms. These cloud the picture sufficiently for us to say that while we accept that the WACC is probably U-shaped for firms generally, we cannot precisely calculate a best gearing level.

This explains why there is such a variation in gearing levels. Some firms are under the influence of particular factors to a greater extent than other firms: some may have very low borrowing capacity, and others may have management keen on signaling confidence in the future; some may have very cautious management unwilling to borrow and a diffuse unco-ordinated shareholder body; some may be in very volatile product markets with high liquidation probabilities and others in stable industries with marketable tangible assets; other companies may be dominated by leaders steeped in the high gearing thinking of the late 1980s and early 1990s, believing that managers are better motivated and less likely to waste resources if the firm is highly indebted.

So, to the question of whether a firm can obtain a level of gearing which will maximize shareholder wealth the answer is ‘yes’. The problem is finding this level in such a multifaceted analysis.

Exhibit 18.5 discusses the importance of adjusting the debt level.

Relieving the debt hangover by giving a fine tune to the accounts

Adrienne Roberts

Much as dyspeptic revellers flock to ‘detox’ remedies after Christmas, the corporate world has spent the past two years remedying its debt hangover. ‘Balance sheet repair’ has been its response to the toxic levels of debt that triggered record numbers of credit rating downgrades in 2002 and brought a slew of companies to the brink of bankruptcy. But even for less indebted companies, balance sheet fine-tuning can make sense.

What is balance sheet repair?

Corporate finance advisers talk about balance sheet repair, reform, restructuring and even ‘sculpting’. Broadly, they all boil down to finding the right capital structure for a company, given its business objectives and market conditions.

Simon Collins, at KPMG Corporate Finance, says: ‘The question to ask is: Is your business dictating your financing structure or is your financing structure dictating the way you do business?’

When is financing structure dictating your business?

One example is capital expenditure constraints. It is one of the first items businesses have to rein in when trying to get debt under control, and this can retard growth.

Credit rating downgrades are another symptom, as too much debt increases credit risk.

Covenants on the company's debt could also be cramping its style.

Covenants require the borrower to do certain things or prohibit it from doing others.

If the business finds itself having to throttle back on spending in the second half of each year for fear of breaching covenants, this could mean it has an inappropriate capital structure.

What does balance sheet repair involve?

Balance sheet repair can mean paying down debt, replacing one kind with another or even borrowing more. It also involves decisions such as looking at which debt markets to tap and what kind of covenant protection the company is willing to give its creditors.

Can a company have too little debt?

In the past two years the most urgent balance sheet repair has involved cutting debt levels. But it is also possible to be under-leveraged.

A company with too little debt may have too high a weighted average cost of capital. This is because debt financing is cheaper than equity: interest payments are tax deductible but dividends are not. One implication of this is that an under-leveraged balance sheet is less tax-efficient.

Other signs of under-leverage include having an unnecessarily high credit rating compared with the peer group.

Shouldn't you always aim for the highest possible rating?

Not necessarily. It all comes back to the relative cost of debt and equity. Many ratings advisers tell their clients to find the 'sweet spot' on their balance sheet.

That is where the company is minimising its weighted average cost of capital and working its equity harder, but has not taken on so much debt as to raise concerns about creditworthiness. Some studies suggest the 'sweet spot' is about a high triple B rating, towards the bottom of the 'investment grade' ratings category.

But it depends on the company. For some, it still makes sense to defend a higher rating. For example, a contractor or a facilities management provider bidding for long-term contracts may need a strong credit rating to signal it has stable long-term prospects.

Which debt market should companies choose?

Companies need to source their financing according to their business and their long term goals.

For example, a utility company building a power plant might do well to issue a 10-year bond to lock in good borrowing rates. But a retail chain's working capital cycle might dictate its financing requirement.

A retailer that builds inventories to a peak in August, then sells all its stock in the run-up to Christmas would be better served by a bank facility.

Tapping the bond market would be more expensive, because it would mean paying interest all year on cash that is only needed for six months.

What about covenants?

Covenants are meant to protect the interests of the lender without unduly restricting the operating and strategic decisions of the borrower.

They are more common in banking facilities than bonds, but bond investors are becoming increasingly insistent on covenant protection.

If a company breaches its covenants – for example if its earnings dip and it fails the interest cover test – it may be deemed to have defaulted. This could mean a penalty interest rate or having to repay the whole bond or loan immediately.

EXHIBIT 18.5 Relieving the debt hangover by giving a fine tune to the accounts

Source: *Financial Times* 27 January 2004

Conclusion

The main focus of this chapter has been on the proportion of debt to equity and the type of debt finance that is most suitable for the company. These ideas and principles must be read with the knowledge of the characteristics of different types of finance in Chapters 15, 16 and 17, and with an understanding of the calculation of the cost of capital (Chapter 10). Each company faces different circumstances and so the most appropriate mixture of finance, with its concomitant risks, is likely to be different from other companies, even those in the same industry. The tools provided in this chapter will hopefully allow a thoughtful discussion when contemplating the best debt level and mixture of debt-types for your firm.

Websites

www.treasurers.org Association of Corporate Treasurers
www.ft.com Financial Times

Notes

- 1 However there are long periods (years) when yield curves show interest rates lower 'at the long end' than 'at the short end'.
- 2 Assume no hedging in the derivative or money markets.
- 3 Quoted in 'Bristol Water plans to return £50m cash' by Rebecca Bream, *Financial Times*, 22 July 2003.
- 4 From 'Next shines brighter as a high street star' by Susanna Voyle, *Financial Times*, 13 September 2002.
- 5 'M&S gives details of cash return' by Susanna Voyle, *Financial Times*, 24 January 2002.
- 6 Paul Pindar, chief executive, quoted in 'Capita shares recover on buy-back plans' by James Politi, *Financial Times*, 8 October 2002.
- 7 These problems also apply to capital gearing measures (2) and (3).
- 8 To make this discussion easier to follow it will be assumed that there are only two types of finance, debt and ordinary shares. However, the introduction of other types of finance does not fundamentally alter the analysis.
- 9 Net worth (or shareholders' equity) divided by Debt plus equity there is another popular capital gearing ratio.
- 10 On the other hand Jensen (1986) has argued that if managers have less free cash flow they are less likely to invest in negative NPV projects, and this restraint is better for shareholders.