Chapter 36

WORKING OUT DETAILS: THE DESIGN OF THE CAPITAL STRUCTURE

Steering a course between Scylla and Charybdis

By way of conclusion to the part on capital structure policy, we would like to reflect once again on the thread that runs throughout this set of chapters: the choice of a source of financing.

We begin by restating for the reader an obvious truth too often forgotten:

If the objective is value creation, the choice of investments is much more important than the choice of capital structure. Because financial markets are liquid, situations of disequilibrium on them do not last. Arbitrages inevitably occur to erase them. For this reason, it is very difficult to create value by issuing securities at a price higher than their value. In contrast, industrial markets are much more "viscous". Regulatory, technological and other barriers make arbitrages – building a new plant, launching a rival product, and so on – far slower and harder to implement than on a financial market, where all it takes is a telephone call or an online order.

An industrial business can therefore hope to find a strategy that secures it an economic rent – that is, a strategy than enables it to earn a return on investment higher than the required return adjusted for risk. If it can do so, it will create value. **But let it harbour no illusions as to permanence: sooner or later, that rent will erode and disappear.**

In other words, a company that has made investments at least as profitable as its providers of funds require will never have insurmountable financing problems. If need be, it can always restructure the liability side of its balance sheet and find new sources of funds. Inversely, a company whose assets are not sufficiently profitable will sooner or later have financing problems, even if it initially obtained financing on very favourable terms. How fast its financial position deteriorates will depend simply on the size of its debt.

Good financing can never make up for a bad investment.

Section 36.1
THE MAJOR CONCEPTS

1/ COST OF A SOURCE OF FINANCING

Several simple ideas can be stated in this context.

1. **The cost of all sources of financing is given by the risk profile and the required return of the investment.** Thus, a cement plant in Russia might require a 25% rate of return, and this will be the case whether it is financed by equity or debt and whether the investor is Russian, Swiss or Indonesian.

The required rate of return is basically independent of the method of financing and the nationality of the investor. It depends solely on the risk of the investment itself.

The following consequences ensue:

- It is generally not possible to link the financing to the investment.
- No "portfolio effect" can reduce this cost.
- Only the bearing of systematic risk will be rewarded.

It is therefore shortsighted to choose a source of financing based on what it appears to cost. To do so is to forget that all sources of financing will **cost the same, given the risk.**

2. For the purpose of managing the liability side of the company's balance sheet, **it is a great mistake to take the apparent cost of a source of financing as its true cost.**

We have too often heard it said that the cost of a capital increase was low, because the yield on the shares was low, that internal financing costs nothing, that convertible bonds can lower a company's cost of financing, and so on. Statements of this kind confuse the accounting cost with the true financial cost.

A source of financing is a bargain only if, for whatever reason, it brings in more than its market value. A convertible bond can be a good deal for the issuer not because it carries a low coupon rate, but only if the option embedded in it can fetch more than its market value.

Let us dwell briefly on the error one commits by confusing apparent cost and true financial cost.

- The difference is minor for debt. It may arise from changes in market interest rates or, more rarely, from changes in default risk. In matters of financial organisation, debt has the merit that its accounting cost is close to its true cost; furthermore, that cost is visible on the books, since interest payments are an accounting expense.
- The error is greater for equity, inasmuch as the yield on the share needs to be augmented for prospective growth.
- The error is extreme for internal financing, where, as we have seen, the apparent cost of reinvested cash flow is nil.
- The error is hard to evaluate for all forms of hybrid securities – and this is often the explanation for their success. But let the reader beware: the fact that such securities carry low yields does not mean their financial cost is low. As we have shown in

the foregoing chapters, an analysis of the hybrid security using both present value and option valuation techniques is needed to identify the true cost of this financing source.

3. When it comes to a company's financing policy, the immediate direct consequences of its sources of financing cannot be neglected.

Debt, by virtue of the liability that it represents for timely payments of interest and principal, has a direct consequence on the company's cash flow. Debt can plunge the company into the ditch if its runs into difficulties; on the other hand, it can turn out to be a turbocharger that enables the company to take off at high speed if it is successful.

Source	Instrument	Theoretical cost to be taken used in investment valuation	Cost according to financial theory (A)	Apparent or explicit cost (accountability, cash flow) (B)	Difference (A)–(B)	Determinants of the difference
Debt		The same for all products, it is a function of the systematic (non-diversifiable) risk of the investment	Market rate at which the company can refinance	Contractual rate	Weak	Evolution of market interest rates; evolution of default risk
Equity	**Shares increase**		Expected return required by the market on shares with the same risk profile	Nil in income statement; apparent cost measured by the return	Important	Expected dividend growth rate
	Self-financing			Nil in the income statement; no apparent cost	Relevant	Total absence of apparent cost
Hybrids products	**Convertible bonds**		Yield to maturity + value of the convertible option	Low yield to maturity	Medium	Value of convertible option
	Preference shares		Return should be slightly lower than the ordinary shares	Higher than ordinary shares and fixed throughout the life of the instrument	Weak	They are shares for which a part of the value is guaranteed (present value of fixed dividends)
	Income bonds		Rate higher than the cost of debt	Mostly linked to the periodical income	Variable according to results	Variability of results

If a company is successful, the cost of a capital increase will appear to be much higher. On the one side, we have a fixed cost (the cost of debt); on the other, we have a variable cost

that can even be negative *ex post*. An issue of new shares at a very high price followed by a crash on the stock market produces a negative rate of return for the investor, and thus a negative cost. (With debt, negative cost can occur only in the case of extreme difficulties in which creditors cancel a portion of their claims.)

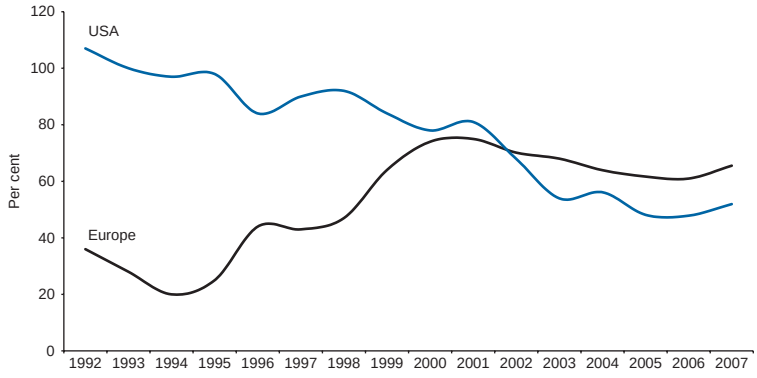
2/ IS THERE A "ONCE-AND-FOR-ALL" OPTIMAL CAPITAL STRUCTURE?

The answer is clear: no, the optimal capital structure is a firm-specific policy and changes across time.

At the same time, there are a few loose ideas on the subject that the reader will have absorbed. Otherwise, how could one explain why the notion of what constitutes a "good" or "balanced" capital structure should have "changed" so much, and so often, over the course of time?

- In the 1950s and 1960s, a good capital structure was one with little debt. Against a backdrop of economic stability, the accent was on securing the company's industrial and financial autonomy.
- In the 1970s, a good capital structure needed to show a "normal" level of debt – that is, (just) not excessive relative to equity. In a context of strong economic growth and low or even negative real (inflation-adjusted) interest rates, the accent was on taking advantage of the financial leverage that debt provides.
- In the 1980s, a good capital structure needed to reflect a rebalancing of the structure of the business, characterised by gradual diminution of debt, improved profitability and heightened reliance on internal financing.
- In the early 1990s, in an environment of low investment and high real interest rates, there was no longer a choice: being in debt was not an option. A new "pecking order" (see Chapter 35) appeared. A company with cash but without opportunities to invest it at a high enough return would choose
    - first to pay down its debt;
    - then to buy back its shares;
    - lastly to raise its payout ratio. This move was last on the list because it mortgages the company's future: a rise in the dividend, unlike a share buy-back, implies a commitment of prospective earnings – the "ratchet" effect of the dividend.
- In the late 1990s, though, debt was back in favour if used either to finance acquisitions or to reduce equity. The reason: nominal interest rates at their lowest level in 30 years. But the euphoric climate of real growth and low inflation gave way in the early 2000s to economic crisis coupled with equity markets virtually closed to new issues, making it hard for companies that had just finished borrowing heavily to quickly rebalance their capital structure.
- In the first part of this decade, the generalised economic crisis and the prudence of financial markets has hampered the convergence toward a more balanced capital structure (for those companies that had strongly used debt in the previous periods).

NET DEBT / SHAREHOLDERS' EQUITY OF LARGEST EUROPEAN AND AMERICAN COMPANIES



Source: Datastream, Eurostoxx 50 et S&P 100.

The great majority of companies had been paying down their debt for more than 10 years, thereby giving them considerable borrowing capacity they could use to get them through a difficult period.

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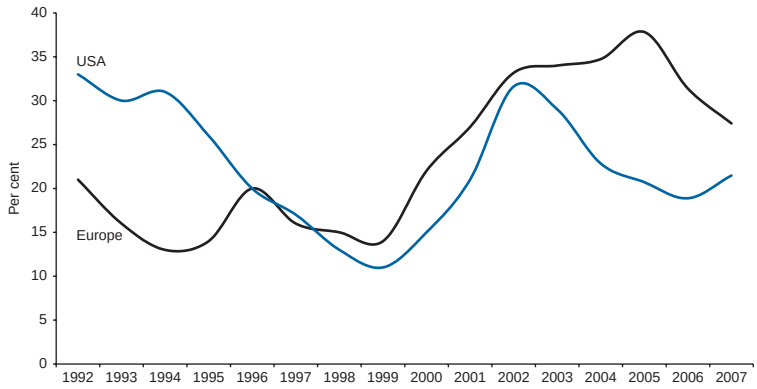
NET DEBT / MARKET VALUE OF EQUITY FOR LARGEST EUROPEAN AND AMERICAN COMPANIES



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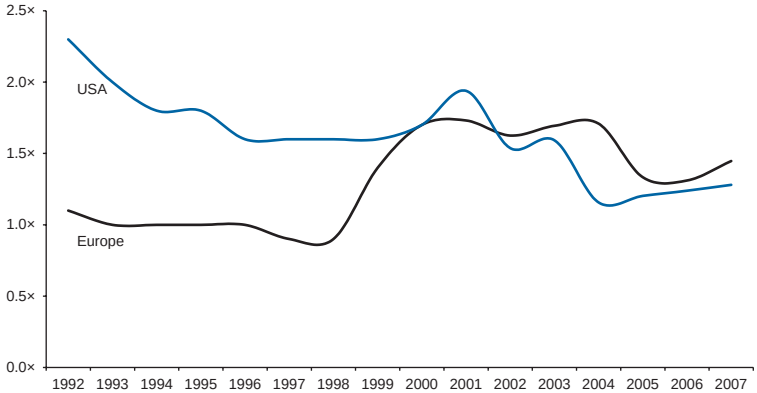
NET DEBT / EBITDA FOR LARGEST EUROPEAN AND AMERICAN COMPANIES



Source: Datastream, Eurostoxx 50 et S&P 100.

3/ CAPITAL STRUCTURE, INFLATION AND GROWTH

Because inflation is always a disequilibrium phenomenon, it is quite difficult to analyse from a financial standpoint. We can observe, however, that during a period of inflation and negative real interest rates, overinvestment and excessive borrowing leads to a general degradation of capital structures. Companies that invest reap the benefit of inflated profits: adjusted for inflation, the cost of financing is low. Shareholders can benefit from this phenomenon as well: a low rate of return on investment will be offset by the low cost of financing.

INFLATION RATE, REAL INTEREST RATE AND GROWTH RATE IN FRANCE

Companies' inclination to take on debt depends a great deal on the real interest rate and the real growth rate of the economy.

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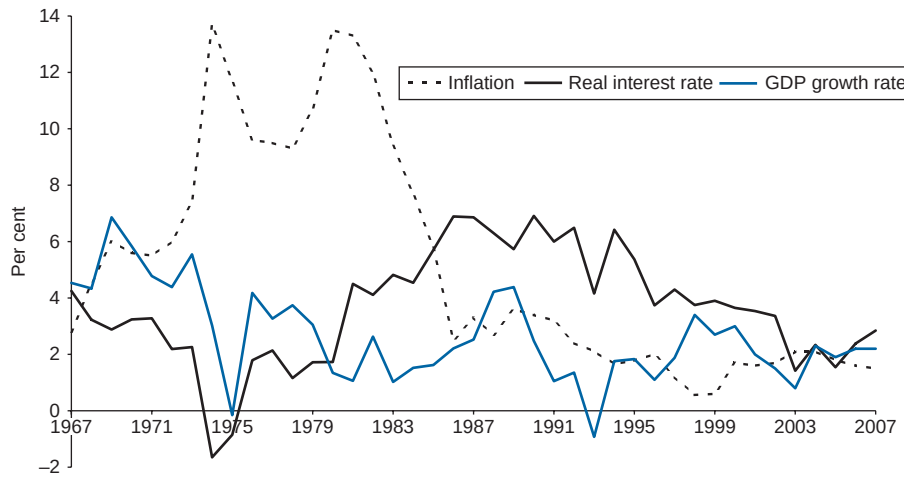


Source: INSEE, Datastream

When inflation is accompanied by low real interest rates, companies are tempted to overinvest and pay for it by borrowing, thereby unbalancing their capital structure.

Disinflation leads to exactly the opposite behaviour: high real interest rates encourage companies to get rid of debt, all the more so that high rates are usually accompanied by anaemic economic activity and a business climate not conducive to borrowing.

4/ WHAT IS EQUITY FOR?

Let us begin by recalling the three fundamental differences between equity capital and debt capital.

- There is no commitment to pay a periodic return on equity, whereas there is such a commitment on debt. The shareholder's reward depends solely on how well the business does, unlike the creditor's.
- There is no commitment to pay back the funds raised from shareholders, whereas there is such a commitment on funds borrowed from lenders.[1]

1 *Except for perpetual notes, which are extremely rare.*

- If the company is liquidated, creditors will be paid in full before shareholders receive anything.

Equity capital thus plays two roles. Its first function is of course to finance part of the investment in the business. The more important purpose, though, is to serve as a guarantee to the company's creditors that finance the other part of the investment. For this reason, the cost of equity includes a risk premium.

Whence the insurance aspect of equity capital (cf. discussion in Chapter 35 of equity as an option): like insurance, equity financing always costs too much until the accident crisis happens, in which case one is happy to have a lot of it. As we will see later, when a crisis does come, having considerable equity on the balance sheet gives a company time – time to survive and restructure when earnings are depressed, to introduce new products, to seize opportunities for external growth, and so on. By comparison, a company with considerable debt suffers greatly because it has fixed expenses (interest payments) and fixed maturities (principal repayment) that will drag it down further.

The amount of equity capital in a business is also an indicator of the level of risk shareholders are willing to run. In a crisis, the companies with the most leverage are the first to disappear.

5/ WHAT IF IT WERE ALL MERELY HERITAGE FROM THE PAST?

One simple idea is that a company's capital structure today is the result that not of any conscious choice of a target debt–equity ratio, but of a series of decisions taken in the past based on the financial context of the moment: issuing shares when the stock market was booming and valuations were high, issuing debt and buying back shares when the market was in a slump and share prices were low.

If its managers had in mind a target debt–equity ratio, any company that raised fresh equity would, in the wake of the capital increase, go out and borrow more in order to move its capital structure back towards the target ratio. This is not what we observe. The companies with little debt are the ones that have capital increases when their relative valuation (measured by the price-to-book ratio) is generous, and vice versa. Similarly, the current capital structure is explained by decisions taken a long time ago and thus by relative valuation levels at the time.

Research by Malcolm Baker and Jeffrey Wurgler (2002) supports the theory that this is indeed the principal determinant of current capital structure, given the highly pragmatic, opportunistic attitude of corporate finance directors – which corresponds entirely to the motivations of investors: issue shares when prices are high, issue debt and buy back shares when prices are low.

Section 36.2
COMPETITORS, RATING, LIFECYCLE AND THE "EXTENDED TRADEOFF" MODEL

Graham and Harvey (2004) surveyed top executives and finance directors at 392 public groups to determine what criteria they use in taking a financing decision. According to their study – which will be further examined in Section 36.6 – the tax saving on debt

was not an essential criterion in the choice of capital structure, nor was fear of substantial bankruptcy costs. Rather, concern about downgrading of the company's credit rating came top of the list. It is reassuring to see that the conclusions of the second Modigliani–Miller article (1963) are not prompting companies to focus on tax considerations in deciding whether or not to take on debt.

Even if companies say they have a fairly precise target for the level of their debt, more than half of all finance directors base their choice of financing on preserving **flexibility**. The reader should recall that flexibility is one of the factors included in the "extended tradeoff model" discussed in Chapter 34.[2]

Although theoreticians and finance professors always emphasise the limitations of EPS dilution as a criterion – it is not automatically synonymous with destruction of value – among practitioners it remains the most important factor in deciding whether or not to have a capital increase. This criterion seems to us a bit outmoded, but we will address it nonetheless in a following section.

The reader will by now have grasped that capital structure is the result of complex compromises also determined by the:

- **capital structure of competitors;**
- **need to preserve an adequate rating;**
- **life cycle of the company.**

These three factors will enrich the tradeoff framework we have discussed in Chapter 34. They will give birth to what we here define as the "**extended tradeoff model**", whose name reflects the higher number of factors the model will manage.

1/ CAPITAL STRUCTURE OF COMPETITORS

- To have higher net debt than one's rivals is to bet heavily on the company's future profitability – that is, on the economy, the strategy, and so forth.
- To have higher net debt than one's rivals, other things being equal, is to be more vulnerable to a cyclical downturn, one that could lead to a shakeout in the sector and extinction of the weakest.

There is good evidence that the average capital structure of the sector is an important benchmark for the management when setting capital structure policies. Experience shows that business leaders are loath to imperil an industrial strategy by adopting a financing policy substantially different from their competitors'. If they have to take risks, they want them to be industrial or commercial risks, not financial risks. The rationale of this behaviour is clear: since all companies behave similarly, the average leverage indicates the sustainable level of financial risk belonging to the same sector!

Our opinion is that benchmarking on competitors is not contradictory with the precepts of the tradeoff model. Companies within the same sector – and in the same stage of the life cycle – share the same basic economic and financial characteristics. Hence, financial policies shouldn't be so different.

Industries with high volatility of cash flows and low tangible assets are those where we expect leverage to be lower. On the contrary, in sectors where flows are stable and companies can provide high collaterals, the use of debt should be higher.

2 *The existence of a long-term optimal ratio and the temporary divergences that frequently can choose to follow could be consistent with the termed 'dynamic trade-off theory' (Hovakimian, Opler and Titman, 2002). This theory says that "although many companies allow their leverage ratios to drift away from their targets for a time, when the distance becomes large enough managers take steps to move their companies back toward the targets. Such dynamic description effectively suggests that, while the pecking order model explains short-run deviations from the target, the traditional trade-off theory holds in the long run" (p.25).*

The choice of capital structure is not absolute but *relative*: the real question is how to finance the business compared with the industry average – that is, compared with the company's competitors.

However, there are at least two situations where the simple replication of what competitors do could be erroneous:

- when the sector is made up of highly heterogeneous companies;
- when the sector is going through a restructuring phase.

With the analyses in hand, the person or body taking the financing decision will be able to do so with full knowledge of the facts. The investor will bear in mind that, statistically (and thus, for his diversified portfolio), his dream of multiplying his wealth through judicious use of debt will be the nightmare of the company in financial difficulty.

The financial success of a few tends to make one forget the failure of companies that did not survive because they were too much in debt.

2/ THE RATING OF THE COMPANY

Ratings agencies have clearly gained in importance – especially in Europe – in the last 20 years, as seen in the 35% annual increase in the number of companies carrying a Moody's rating. In Europe, this is due mostly to the transition from an economy based mostly on banking intermediaries to one where the financial markets are becoming predominant.

Ratings are becoming one of the main concerns of CFOs. According to Kisgen (2007, p. 73): "many (if not most) companies devote considerable attention to credit ratings in designing their financial policy. A higher credit rating can translate into direct benefits for a company's shareholders, including an expansion of the pool of eligible investors, lower cost of debt capital, and more favorable terms from other corporate stakeholders reassured by the firm's implied staying power." Financial decisions are thus frequently taken based partly on their rating impact; or, more precisely, decisions having a negative rating impact will be adjusted accordingly. Some companies even set rating targets (Pepsi, Diageo and Vivendi Universal, for example). This can seem paradoxical in two ways:

- although all financial communication is based on creating shareholder value, companies are much less likely to set share price targets than rating targets;
- in setting rating targets, companies have a new objective: that of preserving value for bondholders! This is praiseworthy and, in a financial market context, understandable, but has never been part of the bargain with bondholders.

We see several possible explanations for this paradox. First of all, a debt rating downgrade is clearly a major event for a group and goes well behind bondholder information. A downgrade is traumatic and messy and almost always leads to a fall in the share price. So in seeking to preserve a financial rating, it is also shareholder value that management is protecting, at least in the short term.

A downgrade can also have an immediate cost if the company has issued a bond with a step-up in the coupon, i.e. a clause stating that the coupon will be increased in the event of a rating downgrade. Step-ups are meant to protect lenders against a downgrade and obviously make managers pay more attention to their debt rating.

A good debt rating guarantees a higher degree of financial flexibility. The higher the rating, the easier it is to tap the bond markets, as transactions are less dependent on market fluctuations. An investment grade company, for example, can almost always issue bonds, whereas market windows close regularly for companies that are below investment grade. The recent seizing up of the high-yield market is quite instructive, as many issues have had to be postponed. The high-yield market is similar in this respect to the equities market. Under the new Basel II banking solvency standards the highest rated companies will probably have even greater flexibility, as loans to them will require lower reserve requirements and banks will more readily agree to them.

Some banks sell the concept of lower cost of capital (and, thus, enhanced value) as a function of rating – for example, obtaining the lowest possible cost of capital for a BBB rating. This is based on the tax savings brought about by financing costs but, beginning with a certain level of debt, the savings are cancelled out by the discounted value of the cost of bankruptcy. Our readers know that we are not great fans of this argument. It looks difficult to maintain that companies rated BBB can be valued significantly higher than others. The average company rating is closer to A, after all, and major groups such as Nestlé and AstraZeneca, which have stable cash flows, do not try to play leverage, preferring to hold onto their very strong rating. Similarly, setting out to obtain the best rating possible is getting things backwards. This minimises the cost of debt, but so what? If it also requires an exorbitant level of equity, the cost of capital has not necessarily been reduced.

There is a phenomenon that is even more perverse than setting a target rating: refusing to be rated or asking for a confidential "shadow rating". Being rated can be scary, and CFOs balance out the lack of flexibility created by the lack of rating (e.g. certain investors can no longer be tapped and the bond market is mostly closed off) with the potential lack of flexibility created by a poor rating.

In extreme cases, we have even seen companies that, in their initial rating process, tried to obtain the worst possible rating for their particular financial profile. They did this in order to gain some flexibility, i.e. some room for their situation to get marginally worse without undermining their rating. In this particular case, caution has a clear impact on value, as a lower rating means higher debt costs. But this is like an insurance premium that always looks too high until an accident strikes.

All in all, the desire of many companies to set a rating target reminds us that financial structure is above all the choice of the level of risk that shareholders choose to run and that the European debt market is becoming a real market with varied, segmented products, offered to investors who need some criteria in making their choices.

3/ LIFE CYCLE OF THE COMPANY

It is a mistake to think that the *tradeoff* model helps us to find an optimal leverage that doesn't change across time. The optimal capital structure is a concept that evolves from sector to sector – as discussed above – and from firm to firm.

Let's think about startup companies. They normally:

- have a high need of equity capital because of their:
  - lower tax shield capacity;
  - high financial distress costs (low tangible assets);
  - short history;

- need additional resource for new investments whose amount normally exceeds annual depreciation.

The necessity of funding with external resources is in this case quite high since internal sources (self-financing and liquidity) are insufficient to cover the amount of new investments in fixed assets and working capital.

At the same time, they must keep an adequate level of financial flexibility for facing the uncertain competitive dynamics of evolving sectors like, for example, advanced technologies. The capital structure of startup companies must then:

- try to match assets and liabilities;
- give the company a financial reserve for absorbing unfavourable reduction of cash flows;
- allow them to exploit real market opportunities.

Furthermore, it is reasonable to assume that the information asymmetries in the initial phases are high and that the use of external equity capital could dilute excessively the shares' value.

A startup will have a hard time getting any debt financing. It has no past and thus no credit history, and it probably has no tangible assets to pledge as security. The technological environment around it is probably quite unsettled, and its free cash flow is going to be negative for some time. For a lender, the level of specific risk is very high. The startup consequently has no choice but to seek equity financing.

At the other extreme, an established company in a market that has been around for years and is reaching maturity will have no difficulty attracting lenders. Its credit history is there, its assets are real, and it is generating free cash flows (predictable with low forecast error) which are all the greater if the major investments have already been made. In short, it has everything a creditor craves. In contrast, an equity investor will find little to be enthusiastic about: not much growth, not much risk, thus not much profitability.

The evidence show that bigger companies – living their maturity phase – tend to have higher leverage ratios, which confirms their high capacity of lowering the costs of debt thanks to their stability and higher fixed assets.

Here we see the **lifecycle of financing sources.** An industrial venture is initially financed with equity. As the company becomes institutionalised and its risk diminishes, debt financing takes over, freeing up equity capital to be invested in emerging new sectors.

Similarly, in an industry with high fixed costs, a company will seek to finance itself mostly with equity, so as not to pile the fixed costs of debt (interest payments) on top of its fixed operating costs and to reduce its sensitivity to cyclical downswings. But sectors with high fixed costs – steel, cement, paper, energy, telecoms, etc. – are generally highly capital-intensive and thus require large investments, inevitably implying borrowing as well.

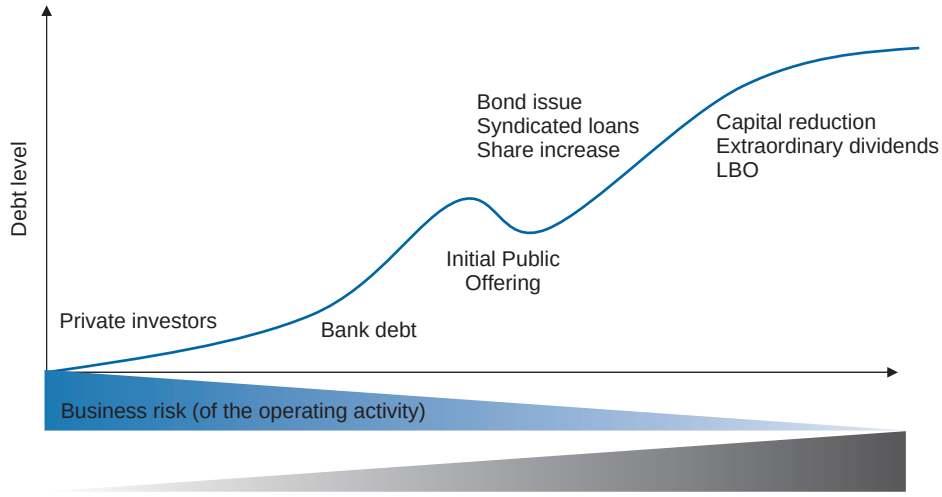
An industry such as retailing with high variable costs, on the other hand, can make the bet that debt entails, as the fixed costs of borrowing come on top of low fixed operating costs.

Lastly, the nature of the asset can influence the availability of financing to acquire it. A highly specific asset, that is, one with little value outside of a given production process, will be hard to finance with debt. Lenders will fear that if the company goes under, the asset's market value will not be sufficient to pay off their claims.

We now have all the elements to introduce the "**extended tradeoff" model.** This model simply adds the life cycle to the "traditional" tradeoff model. For this reason, it is less parsimonious than the basic tradeoff model.

According to the extended tradeoff, the major pros and cons of debt must be weighted by taking into account the different stage of companies. The result is the following:

THE LIFECYCLE OF A COMPANY AND THE EXTENDED TRADEOFF MODEL



	Startup	**Growth**	**Maturity**
Tax shield	Zero	Increases with earnings	High
Disciplining role of debt	Low, shareholders-managers	Increases, new external shareholders	Decreases, little new investments
Information asymmetries	High, business only an idea	Decreases, track record and credibility	Decrease, higher transparency
Financial distress costs	Very high	High	Declining
Agency costs	Very high	High	Declining
Financial flexibility	Very high	High	Low
Extended trade-off	**Costs of debt > Benefits**	**Relevant benefits from debt**	**Benefits of debt > Costs**

Section 36.3
OTHER FACTORS AFFECTING THE CAPITAL STRUCTURE CHOICE

Three other factors can help us to explain the optimal capital structure, on one side, and temporary divergences from it, on the other:

- **shareholder preferences** in terms of risk aversion and willingness to cede control;
- **opportunities or constraints** in the capital markets at a given moment;
- the willingness of the company to **send signals to the market**.

Which of these factors is the most important? Is there a ranking among them?

Our idea here is quite simple. These factors explain *temporary* differences between the optimal capital structure of a company according to the precepts of the extended tradeoff model and its current capital structure.

Thus, there is no specific ranking between the factors. Given the fact that the extended tradeoff model should be the prominent interpreting model, the idea that companies' choices may diverge from the predictions of this model can be imputable to one of the factors mentioned above.

However, the reader should bear in mind that it is difficult to imagine a company systematically diverging from the long-term optimal capital structure, because persisting differences may be the cause of financial disequilibrium.

1/ SHAREHOLDER PREFERENCES

If the company's shareholder base is made up of influential shareholders, majority or minority, their viewpoints will certainly have an impact on financing choices.

Some holders will block capital increases that would dilute their stake because they are unable to take up their share of the rights. A company in this situation must then go deeply in debt. Others may have a marked aversion to debt because they have no desire to increase the level of risk they are bearing.

The choice of capital structure is also the choice of a level of risk that shareholders are willing to incur.

2/ OPPORTUNITIES AND CONSTRAINTS

Since markets are not systematically in equilibrium, opportunities can arise at a given moment. A steep runup in share prices will enable a company to have a capital increase on the cheap (sell shares at a very high price). The folly of a bank that says yes to every loan application and the sudden infatuation of investors for a particular kind of stock (Internet companies in early 2000) are other examples. Lastly, loopholes in tax regulations may create financing opportunities (think of subordinated perpetual notes in the 1980s), but unfortunately the tax administration never stays duped for long.

Let the reader not be intoxicated by opportunities. It is hard to base a financing policy on a succession of opportunities, which are by definition unpredictable. They can happen only on margin.

Furthermore, if the company at some point in time is enjoying exceptionally low-cost financing, investors, for their part, will have made a bad mistake. In their fury, they risk tarnishing the company's image, and it will be a long time before they can be counted on to put up new money. The startup that went public at the peak of the "new economy" boom on the stock market will surely have raised money at low cost, but how will it raise more capital a year later, after its share price has fallen by 70%?

On the contrary, the company may suffer **capital rationing** – that is, a situation in which capital markets cannot satisfy all the financing the companies ask. This may be due to credit restrictions that might occur in turbulent periods as a consequence of authorities' decisions or of bank systems' policies.

3/ SIGNALLING AND DEBT POLICY

Signalling theory is based on the strong assumption that corporate managers are better informed about their companies than the suppliers of funding. This means that they are in a better position to foresee the company's future flows and know what state their company is in. Consequently, any signal they send indicating that flows will be better than expected or that risks will be lower may enable the investor to create value. Investors are therefore constantly on the watch for such signals. But for the signals to be credible there must be a penalty for the wrong signals in order to dissuade companies from deliberately misleading the market.

In the context of information asymmetry, markets would not understand why a corporate manager would borrow to undertake a very risky and unprofitable venture. After all, if the venture fails, he risks losing his job, or worse if the venture causes the company to fail. So debt is a strong signal for profitability, but even more for risk. It is unlikely that a CEO would resort to debt financing if he knows that in a worst-case scenario he will not be able to repay the debt.

Ross (1977) has demonstrated that any change in financing policy changes investors' perception of the company and is therefore a market signal.

It is thus obvious that an increase in debt increases the risk on equity. The managers of a company that has raised its gearing rate are, in effect, signalling to the markets that they are aware of the state of nature, that it is favourable and that they are confident that the company's performance will allow them to pay the additional financial expenses and pay back the new debt.

This signal carries its own penalty if it is wrong. If the signal is false, i.e. if the company's actual prospects are not good at all, the extra debt will create financial difficulties that will ultimately lead, in one form or another, to the dismissal of its executives.[3] In this scheme, managers have a strong incentive to send the correct signal by ensuring that the firm's debt corresponds to their understanding of its repayment capacity.

Ross has shown that, assuming managers have privileged information about their own company, they will send the correct signal on condition that the marginal gain derived from an incorrect signal is lower than the sanction suffered if the company is liquidated.

3 *Note that a bad manager whose forecast of future flows was unintentionally wrong will be sanctioned just as much as one who deliberately sent the wrong signal.*

"*They put their money where their mouths are*." This explains why debt policies vary from one company to the other: they simply reflect the variable prospects of the individual companies.

The actual capital structure of a firm is not necessarily a signal, but any change in it certainly is.

When a company announces a capital increase, research has shown that its share price generally drops by an average 3%. The market reasons that corporate managers would not increase capital if, based on the inside information available to them, they thought it was undervalued, since this would dilute the existing shareholdings in unfavourable conditions. If there is no pressing reason for the capital increase, investors will infer that, based on their inside information, the managers consider the share price to be too high and that this is why the existing shareholders have accepted the capital increase. On the other hand, research has shown too that the announcement of a bond issue has no material impact on share prices.

It follows that the sale of a manager's stake in the company is a very negative signal. It reveals that he has internal information indicating that the value of future flows, taking risk into account, is lower than the proceeds he expects from the sale of his investment. Conversely, any increase in the stake, especially if financed by debt, constitutes a very positive signal for the market.

This explains why financial investors prefer to subscribe to capital increases rather than buy from existing shareholders. It is also the reason why every year in the US and the UK, all directors must disclose the number of shares they hold or control in the companies of which they are board members.

Section 36.4
EFFECTS OF THE FINANCING CHOICE ON ACCOUNTING AND FINANCIAL CRITERIA

With this description of the key ideas in mind, the time has come for the reader to implement a choice of capital structure as part of a financing plan. To this end, we suggest that the following documents be at hand:

1 past financial statements: income statements, balance sheets, cash flow statements;
2 forecast financial statements and financing plan, constructed in the same form as past cash flow statements. These can be either mean forecasts or simulations based on several assumptions; the latter strikes us as the better solution. A simulation model will be very useful for establishing the probable future course of the company's capital structure, profitability, business conditions, and so on, given a set of assumptions. This kind of exercise is facilitated by using spreadsheet software and simulation assumptions that allow for a dynamic analysis;
3 to be fully prepared, the analyst will also want to have sector average ratios, which can be obtained from various industry studies.

An important task is then to study the consequences of a financing choice on pre-tax earnings. This traditional yardstick is not sufficient, though, if the financing plan calls for issuing new shares. When that is the case, the analyst will need to look at earnings per share and book value per share.

1/ IMPACT ON BREAKEVEN POINT

Other things equal, debt raises the company's breakeven point.

This is obvious inasmuch as interest payments constitute a *xed cost* that cannot be reduced except by renegotiating the terms of the loan or filing for bankruptcy. Take as an example a company with fixed costs of 40 and variable costs of 0.5 per unit sold. If the selling price is 1, the breakeven point is 80 units. If the company finances an investment of 50 with debt at 6%, the breakeven point rises to 86 units because fixed costs have increased by 3 (interest expense on the borrowing). If the investment is financed with equity, the breakeven point stays at 80.

The problem is trickier when the interest rate is indexed to market rates but the interest payments are still a fixed cost in the sense of being independent of the level of activity. Typically, interest rates rise when general economic activity is weakening. In such a case, it is important to test the sensitivity of the company's earnings to changes in interest rates. Take the previous example but suppose that the debt bears a floating rate. If the interest rate rises to 10%, the breakeven point goes to 90 units; if it rises to 15%, breakeven goes to 95.

In a period of difficult economic conditions and rising interest rates, the company's interest expense increases, raising its breakeven point and worsening its problems.

2/ IMPACT ON RETURN ON EQUITY

For a company with no debt, the return on equity is equal to the rate of return on capital employed. For a company with debt, one must add to the former a supplement (sometimes negative) for the effect of financial leverage (difference between ROCE and cost of debt, multiplied by the debt–equity ratio; see Chapter 13).

The analysis of the return on equity must therefore distinguish the part due to the economic return on capital employed from the part due to leverage. However, a static analysis is not sufficient. What is needed is to determine the sensitivity of return on equity to any change in financial leverage, cost of debt, or return on capital employed.

3/ IMPACT ON EARNINGS PER SHARE

An investment financed by debt increases the company's net profit, and thus earnings per share, only if the after-tax return generated by its investments is greater than the after-tax cost of debt. If this is not the case, the company should not make the investments. If an investment is particularly sizeable and long-term, it may happen that its rate of return is less than the cost of debt for a period of time, but this must be a temporary situation.

To study these phenomena, companies are accustomed to analysing changes in earnings per share relative to operating profit (EBIT).

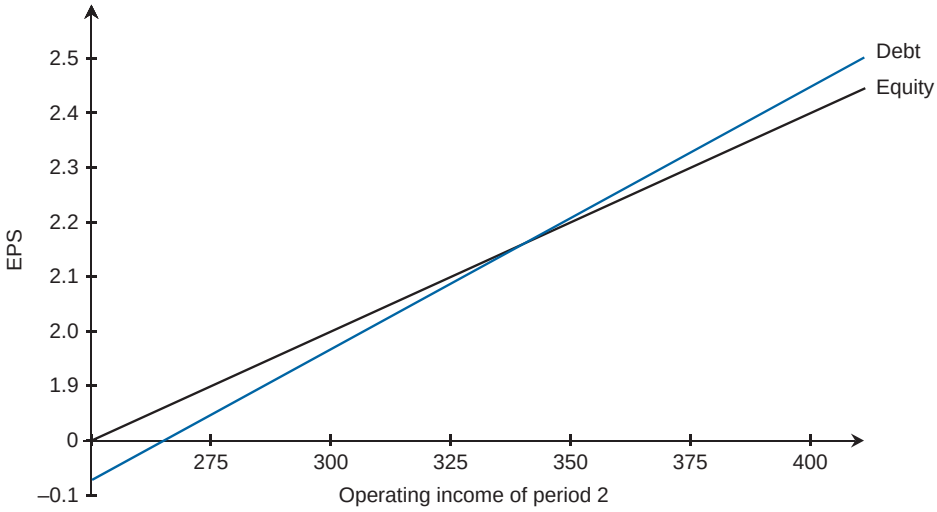
Example Consider the example of a company which makes an investment of 200 in period 0 that will become fully operational in period 2. This investment is financed by a call to shareholders (case A) or by borrowing (case B). A simulation of the main parameters of profitability gives the results shown in the table below.

	Period 0	Period 1		Period 2	
		Case A	Case B	Case A (Equity)	Case B (Debt)
Operating profit (EBIT)	300	300	300	370	370
– Interest expense at 6%	0	0	12	0	12
= Pre-tax profit	300	300	288	370	358
– Income tax at 35%	105	105	101	130	125
= Net profit	195	195	187	242	233
Number of shares	100	120	100	120	100
Earnings per share	1.95	1.62	1.87	1.85	2.33

In period 2, earnings per share will be greater if the investment is financed by debt. In case B, the interest expense reduces EPS, but by less than the dilution due to the capital increase in case A.

This conclusion cannot be generalised, however. The chart below simulates various levels of EPS as a function of operating profit in period 2.

FINANCING ALTERNATIVES AND THEIR IMPACT ON EPS



The reader will be able to verify that if operating profit is less than 340, the preceding assertion is reversed. However, a steep decline in earnings is required to produce this result.

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Let's now discuss the limitation of the EPS analysis in more detail. We know that – as a first approximation – P/EPS can be considered as a proxy of the reciprocal of the cost of equity. We also know that the price of a share is the result of earnings per share (measure of return) times the reciprocal of the cost of equity (measure of risk):

$$P = EPS \times \frac{P}{EPS}$$

Capital structure policies should then be always examined considering their impact on *price and value* rather than earnings per share. In a no-growth world, price is the result of earnings per share *and* perceived risk.

In short: beware! The faster growth of EPS with debt financing is a purely arithmetic result; it does not indicate greater value creation. It is due simply to the leverage effect, the counterpart of which is a higher level of risk to the shareholder.

An investment financed by debt increases EPS in year *N* if the company's marginal return on capital employed in year *N* is greater than the after-tax cost of debt.

An investment financed by equity in year *N* increases EPS in year *N*+1 if the company's marginal return on capital employed in year *N* + 1 is greater than the reciprocal of P/E in year *N*.

4/ IMPACT ON SOLVENCY

Debt increases the company's risk of becoming insolvent. We refer the reader to the development of this topic in Chapter 14.

5/ IMPACT ON LIQUIDITY

The liquidity of the company is its ability to meet its financial obligations on time in the ordinary course of business, obtain new sources of financing and thereby ensure balance at all times between its income and expenditure.

In a truly serious financial crisis, companies can no longer obtain the financing they need, no matter how good they are. This is the case in a crash brought on by a panic. It is not possible to protect oneself against this risk, which fortunately is altogether exceptional. The more common liquidity risk occurs when a company is in trouble and can no longer issue securities that financial markets or banks will accept; investors have no confidence in the company at all, regardless of the merit of its investment projects.

Liquidity is therefore related to the term structure of financial resources. It is analysed both at the short-term level and at the level of repayment capacity for medium- and long-term debt. This leads to the use of traditional concepts and ratios that we have already seen: working capital, equity, debt, current assets/current liabilities, and so on.

For analysing the impact on liquidity, the simulation must bear on free cash flows. The analyst will need to simulate different levels of debt and repayment terms and test whether free cash flows are sufficient to pay off the borrowings without having to reschedule them.

Section 36.5
WORKING OUT THE DETAILS OF THE CAPITAL STRUCTURE

The capital structure policy is ideally a three-step process:

Step 1 The financial manager must decide the desired mix of debt and equity. This is the choice between the debt/equity mix.

Step 2 A firm that is not positioned at its optimal debt ratio should decide (if) and how to reach the optimal level.

Step 3 The financial manager is called to decide about the most appropriate financing vehicle for raising capital.

So far we have discussed thoroughly only the first step which, however, is the most important because it underlies the financial equilibrium of the company. We shall now dedicate some attention to the other two steps.

1/ THE CONVERGENCE PATH

This second-step decision – the decision regarding if and how to get to the optimal level – involves the analysis of two joint aspects:

- The *speed* of convergence toward the optimal ratio. This decision is strictly firm-specific because different circumstances may influence it.
- The *alternative methods* that the company can use to achieve the desired result.

We shall now first discuss the reasons for which a company may decide *not to move* to the optimal debt ratio. Let's start our analysis with underlevered firms because this is the less problematic situation for a company (after all, it doesn't risk going bankrupt!). Companies may prefer to neglect the value maximising objective – which underlies the extended tradeoff model and the optimal leverage – because the finance function may have different objectives. If the company prefers to increase income as much as possible or to maintain a high bond rating, the financial manager will try to keep the company underlevered.

Regarding the maximisation of net income, the rationale it is quite clear: a company which carries low debt has a limited amount of interest expenses and thus a higher net income.

Less obvious is the emphasis that a company may put on maintaining a high rating. Rather than a lot of words, the reader would surely prefer to read the word of the treasurer of Pepsi who said:[4] "One of our financial aims at Pepsi is to minimise the amount of cash on our books. More precisely, our objective is to have zero excess cash on the books [. . .] *At the same time, we try to have the maximum amount of debt that we can while still maintaining our single-A credit rating*."

4 *Chew (2003), p. 214.*

Why? It is the treasurer yet again who provides us with an excellent rationale: "We want to be single-A because that gives us immediate access, under almost any conditions, to large amount of cash at best rates from all the commercial paper markets in the US, Europe and Japan." So, companies with a huge need of short-term debt and financial flexibility could decide to remain underlevered in order to keep its rating unchanged.

If a company raises a lot of funds from the commercial paper market, a lowering of the credit rating could imply two unpleasant consequences:

1 the total size of the market is lower and thus the firm may incur capital rationing in periods of market uncertainty;
2 the average amount of issues shrinks dramatically and thus bigger firms may not collect all the money they need.

The following figures will convince the reader: the US commercial paper market amounted to $1.8 trillion at end-2007, and $2.2 trillion before the crisis broke out in summer 2007.

However, we think that maintaining a high grade rating doesn't necessarily conflict with the tradeoff objective. After all, it seems that these companies have a maximum leverage represented by the amount of debt they can raise without seeing their rating being lowered. Let's ask some additional help from our treasurer: "We do have a capital structure or leverage target. And we arrive at that target by determining the largest leverage ratio consistent with our desired credit rating. Once we get to that leverage target, we try to stay there. How do we stay there? Mainly by using our excess cash to buy back stocks."[5]

5 *Chew (2003), p.214.*

A final reason that may be suggested to explain the underlevered choice is the desire of firms to avoid debt covenants that come with debt. Covenants tend to restrict the managerial flexibility and the degrees of freedom in exploiting the investment opportunities that may arise in the future.

More problematic is the opposite case regarding overlevered firms, because these firms face a high probability of default and bankruptcy. The "bankruptcy fear" may be overcome only if there is a counterbalancing force which may justify excessive debt ratios. This counterforce may be represented by governments and local authorities who may decide to shield firms from the costs associated with default or to back up loans made by banks to companies. In these cases, companies may decide voluntarily to remain overlevered.[6]

6 *This helps us to explain the undoubtedly excessive debt ratios of Korean rms during the 1990s and the reluctance of local companies to decrease leverage.*

If the firm is aware that it is far from the optimal leverage and decides that it doesn't want to stay away from that point, the first important decision is the **speed of change**: gradual vs. immediate.

The most important advantage of moving rapidly toward the optimal point is that it is possible to benefit immediately from a lower cost of capital and a higher value. But the company must be sure of the calculation. In fact, the worst signal the management can send to the market is to discover that the optimal ratio was not exactly the one toward which the company has converged, but a different one. If the management is not confident about the optimal leverage of the firm, it would be better to move slowly and discover step-by-step the degree of precision of their calculations.

Underlevered firms (Palepu, 1986) may decide to change the capital structure rapidly if a takeover threat is high. In fact, many hostile acquisitions are financed with the unused debt capacity. Thus, firms with excess capacity tend to adapt to the optimal quickly in order to reduce the probability of takeover.

There are **five alternative methods** that can be used to change the debt–equity mix:

1 **Recapitalisation**. This is done by using new equity to retire debt (reduce leverage) or new debt to buyback equity (or paying a large dividend). This alternative is frequently a necessity for companies under takeover threat. Recapitalisations aimed at

increasing the debt ratio in a fast and substantial way are called *leveraged recapitalisations*. On the contrary, *equity-for-debt swaps* are designed to reduce leverage with debt agreements by which lenders take an equity stake in the firm in exchange for a portion of debt in their possession.

2 **Divestitures**. The firm can change its debt ratio by selling part of the assets and using the proceeds of the sale to pay off debt or to reduce equity. Naturally, if the firm chooses this alternative it needs to select the assets to be divested with extreme care. On the one side, companies should in principle sell assets earning less than the cost of capital; on the other, the assets must also be attractive for potential buyers and the amount they are willing to pay for those assets. The recent move of Vivendi Universal to reduce debt through disposal is a good example.

3 **Sale and leaseback**. This solution allows the company to sell assets to a leasing company, collect money, repay debt or equity while retaining possession of the assets by retaking them with a leasing from the leasing company. The company can thus reduce the capital employed and modify the debt/equity ratio with the proceeds of the sale. But it usually corresponds more to window-dressing than a real reduction of debt.

4 **Use of a different mix of financing for the new investments**. In this case, the company will change its leverage ratio *gradually*. The speed of change will be related to the amount of new investments, the incidence of their value on the existing investments, and the difference between the debt ratio chosen for the new investment and the current debt ratio of the company.

5 **Changing the amount of cash returned to shareholders**. This means that a new dividend policy may alter the debt ratio of the company. If the firm uses earnings and cash flows to increase the dividend payout ratio or distributes extraordinary dividends the debt ratio will go up because the company takes cash out of the firm and the firm becomes less valuable. This method normally implies a *gradual* change of the debt ratios.

The reader is surely aware that the five alternatives satisfy different needs. For the sake of simplicity, we can say that the first three methods are useful if there is an urgency for change because, for example, the company is under threat of a takeover or it is in serious financial distress.

If the company is neither under bankruptcy or takeover threat, alternatives 3 and 4 could be preferred because they leave the management the flexibility of deciding along the way if the optimal debt ratio is exactly what they calculated at the beginning of the changing process.

2/ THE MATURITY, BASIS AND THE CURRENCY STRUCTURE OF DEBT

Once the company has decided the amount of optimal debt, many other decisions are still to be taken. They basically concern the **design of debt**. Here we want to focus attention on three important aspects of the design:

1 **The maturity structure of debt** – that is, the amount of short- and long-term debt.

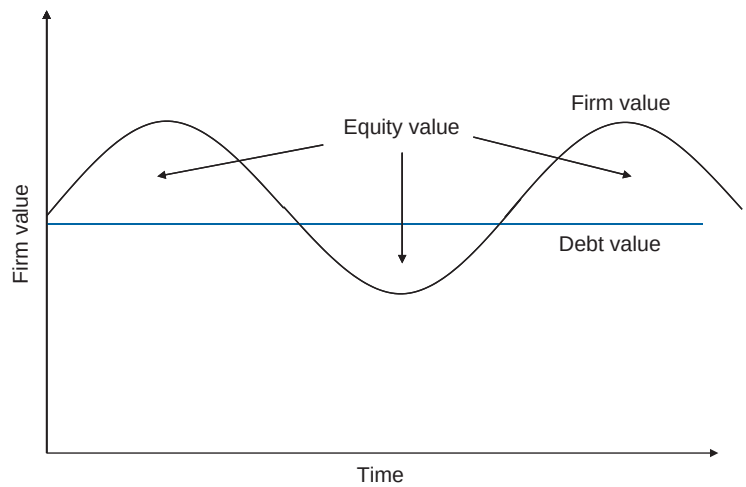
2 **The basis structure of debt** – i.e. the incidence of fixed vs. floating rate debt. Companies can choose to undergo interest rate risk:

- either through the income statement, under the form of higher interest rates, if the debt is floating rate; or
- through the balance sheet, under the form of a lower value of debt, if the debt is fixed rate;

3 **The currency structure of debt** – that is, the amount of debt issued in foreign currencies. If the company has part of its revenues or cash flows in foreign currencies it should decide if it wants to issue some debt in the same foreign currencies. By so doing, the company matches the inflows with the outflows and avoids currency risk.

Let's examine the basic coordinates of the problem. We know that the value of a firm is given by the present value of the cash flows generated by its assets and that this value changes cyclically over time. If we assume that the company is financed only with short-term debt which is not influenced by changes in macroeconomic variables, the situation would be the following:

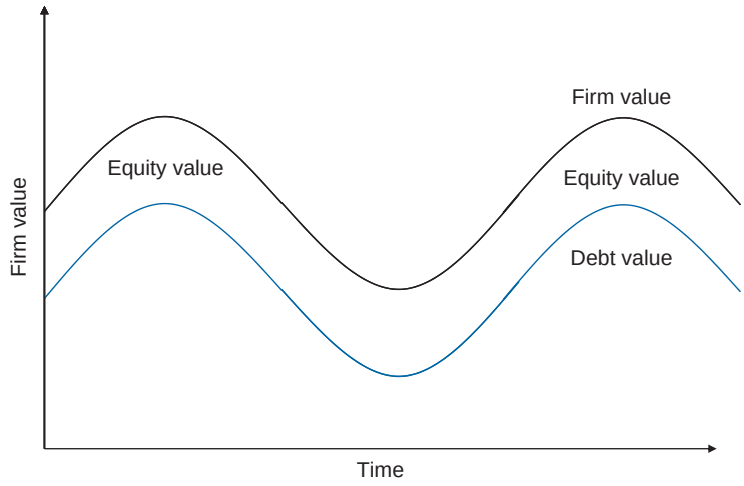
FIRM VALUE OVER TIME WITH SHORT-TERM DEBT



In some periods the company may suffer a serious bankruptcy problem, since the value of debt is higher than the value of the firm (and thus the equity value is negative). The company facing such a situation will surely try to borrow less and abandon the tax shields and the other advantages of debt.

If the firm can design financial debt so that the cash outflows of the service of debt match exactly the cash inflows, debt and equity value would follow a completely different dynamic:

FIRM VALUE OVER TIME WITH LONG-TERM DEBT



The debt value can be designed so that it moves accordingly to the enterprise value. If the firm is successful in doing so, the equity value remains constantly positive. The bankruptcy probability is then reduced substantially and the company can have a higher debt capacity and a higher optimal debt ratio.

There is a simple (but strong!) principle that the financial manager can use if he wants to avoid additional risks: match as closely as possible cash outflows (due to the service of debt) with cash inflows. This principle can be termed the "matching principle" or the "hedging principle".

The perfect matching is of course not always achievable as desired, but the financial manager should do his best to inspire financial policies with this principle in mind if he wants to minimise the credit and financial risks.

We will now give the reader a basic "toolbox" to help him satisfy the "hedging principle".

(a) Debt maturity structure

The application of this principle to financing maturity choice requires matching the *duration of assets* with the *duration of liabilities*. This is the **cash-flow-matching approach**. While there are no particular difficulties in estimating the duration of debt, we could have problems in defining the duration of assets.

In this regard, the estimate of the duration of a project or assets can be done using the sequence of the expected operating cash flows (CF_t):

$$\text{Duration of Assets} = \frac{dPV}{dr} = \frac{\left[\sum_{t=1}^{N} \frac{t \times CF_t}{(1+r)^t} + \frac{N \times TV}{(1+r)^N}\right]}{\left[\sum_{t=1}^{N} \frac{CF_t}{(1+r)^t} + \frac{TV}{(1+r)^N}\right]}$$

where r is the market (free-risk) interest rate, TV is the terminal value and N the horizon of analysis.

The duration of assets can be alternatively interpreted as:

1 a measure of *when*, on average, the cash flows on the assets come due;
2 a measure of *sensitivity* of asset value to a 1% change in interest rates.

An alternative – and conceptually better – measure of duration can be obtained regressing the changes in asset value (for listed companies) or in the operating income (for listed, unlisted and short-lived companies) on interest rate changes:

$$\Delta \text{Asset value}_t = a + b \times \Delta \text{ Interest rate}_t$$

If we adopt this methodology, the coefficient b is a proxy of the duration of the assets (or of the operating income). "Regression methodology" is based on historical data and should always be used after controlling the significance of the t-test of the coefficient b.

Conceptually, this methodology could be acceptable if we consider that the one based on the explicit duration formula keeps cash flows fixed while interest rates change. In practice, cash flows can be affected by interest rate changes – if interest rates rise, cash flows usually decrease – and the link between the two variables is basically a function of the business the firm operates. Thus, the duration formula tends to underestimate the actual one. Regression methodology should help to overcome this problem.

However, once the appropriate duration of the assets has been calculated the company should try to have a maturity structure of its debt with a similar (*average*) duration.[7]

The most important consequence is that – no matter the direction of interest rates changes – the value of asset and liabilities will go up or down for the same amount. Equity value will then be unaffected by interest rates.

The strong interdependence between investments and liabilities has also been examined by the **agency costs** or **"incentive contracting" hypothesis** (Myers, 1977). According to this second approach, the optimal leverage of a company is a function of the growth opportunities that companies have in the different stages of their lifecycle. The agency cost hypothesis argues that shortening the effective maturity of debt can mitigate conflicts of interests. Using shorter-term debt forces managers to periodically generate information for investors to evaluate return and risk of major operating decisions. Investors will thus reprice the debt upon maturity based on new information. This approach mitigates asset substitution and underinvestment problems. Furthermore, short-term debt triggers effective monitoring by requiring periodic repayments of principal.

7 *The reader should also recall that duration is a linear operator, i.e. the average duration of two assets is simply a weighted average of the single duration.*

Companies with high growth opportunities should thus:

- use a higher amount of equity capital (to avoid the underinvestment problem);
- have a higher percentage of short-term debt, since the agency costs are higher for longer maturities. If the company wants to avoid the underinvestment problem it could be more appropriate to raise debt which will mature before it exercises its growth option.

The empirical evidence on incentive contracting hypothesis is not univocal. Barclay and Smith (1995, 1996) and Guedes and Opler (1996) have obtained results consistent with the hypothesis that companies with higher growth opportunities have a higher incidence of short-term debt. On the contrary, Stohs and Mauer (1996) and Scherr and Hulburt (2001) haven't found statistically robust evidence between the market-to-book ratio (a proxy of growth opportunities) and the debt maturity structure.

The third approach to the maturity choice is a **tax-based explanation** (Brick and Ravid, 1985). If the term structure of interest rates is not flat then the long-term debt could be a better solution because coupons on long-term bonds are higher than coupons on short-term bonds and the tax benefit of debt is accelerated.

A recent article by Berger (2005) has examined the **role of credit risk and information asymmetries** in the debt maturity choice. This article is based on two theoretical models linking debt maturity to company ratings – the Flannery model and the Diamond model.

Flannery explained that debt maturity should be an upward-sloping function of the company's risk rating. It is better for a high-risk business to borrow over a period that is in line with its project (i.e. generally long term). In the case of short-term borrowing, the bank could make a quick assessment of the level of risk of a project, and require the corporate borrower to pay a very high interest rate to renew the loan (over and above the loan fees). Additionally, the company will not want to add to the financial risk involved in periodically renewing its loans to the risk of its project. By taking out a long-term loan, the company reveals the high-risk nature of its business, but avoids the costs of renewing the loan. A company involved in a low-risk business will, however, be prepared to bear these costs by taking out a short-term loan, which sends out a signal that it is a high quality enterprise.

According to Diamond, this relationship could not be valid for very high-risk businesses. Banks could refuse to grant them long-term loans but agree to short-term loans in order to obtain information on their projects. For both models, the relationship between risk and maturity is explained by information asymmetry.

The test carried out by the authors tends to confirm the Flannery model. When there is information asymmetry, corporate debt maturity increases with risk. The relationship will continue to slope upwards for very high-risk companies, contrary to predictions by Diamond. This happens when loans are for both small and large amounts. This study also shows that this relationship is indeed explained by information asymmetry. The impact of risk on maturity disappears when research is restricted to banks using techniques to reduce information asymmetry (especially small business credit scoring).

(b) Fixed vs. floating rate

The second important choice is whether the debt should be fixed or floating rate. Generally speaking, it seems reasonable to see a higher percentage of floating-rate debt if:

1 there is high uncertainty about the duration of future investments. If the firm is restructuring itself or the industry to which it belongs is undergoing profound transformations, the estimate of duration of assets may be difficult to do. In these cases, the firm may prefer to use short-term or floating-rate debt until the uncertainty fades away;
2 the cash flows of the company are affected by the inflation rate. When operating income has a positive covariance with interest rates the company should consider using floating-rate debt. Floating-rate debt has interest payments that increase when market rates increase and vice versa. The "cross-hedging" argument assumes that the company reduces the risk of bankruptcy, increases its debt capacity and gets a greater value from leverage. The regression methodology examined above (with interest rate as the independent variable) can give some indications also regarding the choice of the optimal basis structure of debt.

In addition to the changes in interest rates, we may also use the changes in inflation rate as the independent variable:

$$\Delta\text{Asset value}_t = a + b \times \Delta\text{Inflation rate}_t$$

Coefficient b is a proxy of the sensitivity of the asset (or the operating income) value to the inflation rate. The inflation rate is a crucial determinant of interest rates: they tend to increase when inflation is high and decrease when inflation is low. If the earnings and cash flows follow the same dynamics (i.e. earnings increase when inflation is high and decrease when inflation is low) the firm should predominantly use floating-rate debt.[8]

8 *Earnings tend to grow with in ation when companies have a high pricing power over its products. This power may be the result of external regulation, the uniqueness of its products or leadership in their industries.*

(c) Currency structure

The hedging principle applies also to currency structure. The idea is that if companies have cash inflows from operating assets denominated in foreign currencies the liabilities should be issued in the same proportion in the foreign currencies. Thus, a European company that expects 30% of its cash flows to be in US dollars should try to mitigate the currency risk issuing 30% of debt in US dollars.

Section 36.6
CAPITAL STRUCTURE POLICIES: A LOOK AT THE EVIDENCE

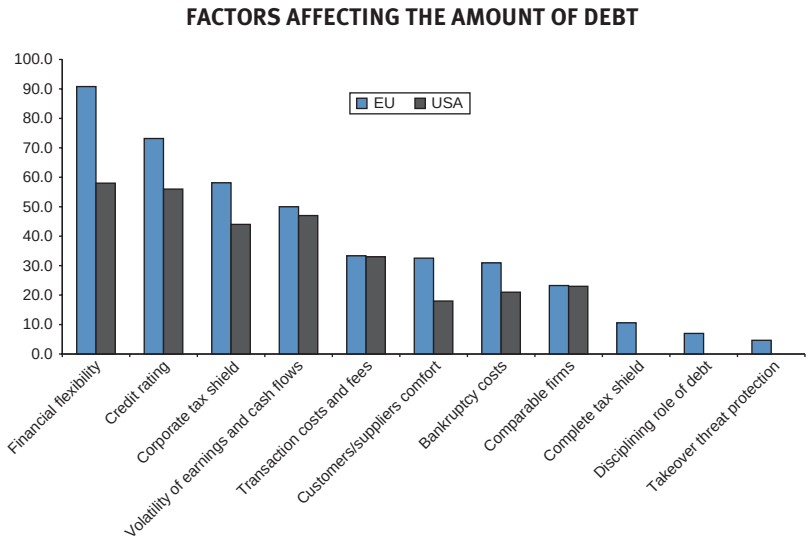
It is now time to discover if the principles and the guidelines discussed in these chapters are consistent with the behaviour of financial management.

To this regard, we compare the Graham and Harvey survey (2001) with the survey of Bancel and Mittoo (2002). We have already mentioned the Graham and Harvey article. The Bancel and Mittoo study is basically a "replica" of Graham and Harvey applied to European companies. The authors surveyed managers in 16 European countries to examine the link between theory and practice of capital structure across countries with different legal systems.

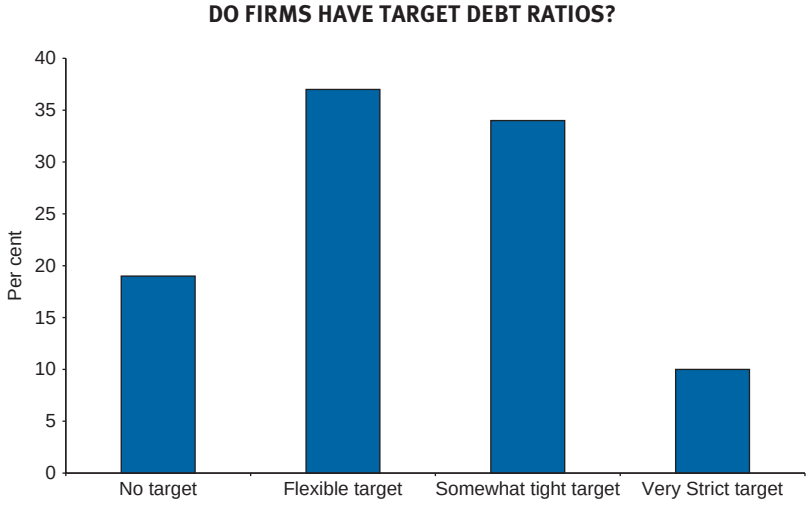
Generally speaking, it is surprising to discover that the two geographical areas are so alike. In most of the cases, the answers given by the financial managers in the EU and USA tend to be the same.

This is in fact the case regarding the most important factors affecting the amount of debt: financial flexibility is the key issue in determining the capital structure choice in both areas. Similarly, the necessity of maintaining the credit rating unchanged is the second most important factor while the tax shield ranks third in Europe and fourth in the USA. There is little evidence about the influence of bankruptcy costs and industry norms of capital structure.

1/ EVIDENCE ON CAPITAL STRUCTURE



(A) Capital structure choice is primarily driven by financial flexibility, credit rating and corporate tax shield



(B) The % of companies that do not have a target leverage are a minor fraction. It is however important to observe that the bulk of the answers regard a less flexible leverage target

(C) The maturity structure decision is mainly driven by the matching principle and the will to avoid the refinancing risk that may occur if the company should raise debt in "bad times".

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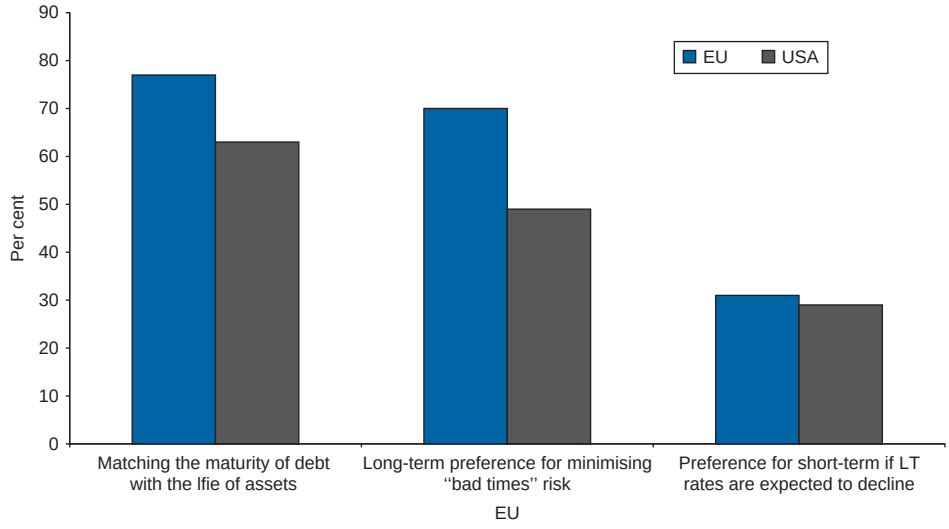
FACTORS AFFECTING THE CHOICE BETWEEN SHORT- AND LONG-TERM DEBT



Source: Graham & Harvey (2001)

The similarities between the capital structure determinants are consistent with the recent findings on capital structure of companies belonging to different countries and economic systems. Common wisdom has long held that, in relationship-based economies such as Germany, Italy and Japan, companies have higher leverage than companies in market-oriented economies, like the US and the UK. The higher leverage should in turn reduce the weighted average cost of capital and increase the competitiveness of companies.

The "folklore" of higher borrowing capacity comes from the strong relationship with banks. These institutions support companies when they are close to distress and exercise some control over investment policies to make sure it does not go awry. As a consequence, the costs of debt tend to disappear while the benefits remain. In short, companies in these countries tend to have a higher borrowing capacity.

This "folklore" has been questioned. According to Zingales and Rajan (1998), Japanese and German companies do not borrow more than US companies and, in fact, German as well as UK companies seem to borrow less than their international competitors.

SUMMARY

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Whereas frequent disequilibria in industrial markets allow hope of creating value through judicious investment, the same cannot be said of choosing a source of financing. Financial markets are typically close to equilibrium, and all sources of financing have the same cost to the company given their risk.

The cost of financing to buy an asset is equal to the rate of return required on that asset, regardless of whether the financing is debt or equity and regardless of the nationality of the investor.

It follows that the choice of source of financing is not made on the basis of its cost (since all sources have the same risk-adjusted cost!). Apparent cost must not be confused with

financial cost (the true economic cost of a source of financing). The difference between apparent cost and financial cost is low for debt; it is attributable to the possibility of changes in the debt ratio and default risk. The difference is greater for equity owing to growth prospects; greater still for internal financing, where the explicit cost is nil; and difficult to evaluate for all hybrid securities. Lastly, a source of financing is cheap only if, for whatever reason, it has brought in more than its market value.

Because there is no optimal capital structure, the choice between debt and equity will depend on a number of considerations:

- Macroeconomic conditions. High real (inflation-adjusted) interest rates and low activity growth will prompt companies to deleverage. Inversely, rapid growth and/or low real interest rates will favour borrowing.
- The desire to retain a degree of financial flexibility so that any investment opportunities can be quickly seized. To this end, equity financing is preferred because it creates additional borrowing capacity and does not compromise future choices. Inversely, if current borrowing capacity is used up, the only source of financing left is equity; its availability depends on share prices holding up, which is never assured.
- The maturity of the industry and the capital structure of competitors. A start-up will get no financing but equity because of its high specific risk, whereas an established company with sizeable free cash flows but little prospect of growth will be able to finance itself largely by borrowing. Companies in the same business sector often mimic each other (what matters is to be no more foolish than the next guy!).
- Shareholder preferences. Some will favour borrowing so as not to be diluted by a capital increase in which they cannot afford to participate. Others will favour equity so as not to increase their risk. It is all a question of risk aversion.
- Financing opportunities. These are by definition unpredictable, and it is hard to construct a rigorous financing policy around them. When they occur, they make it possible to raise funds at less than the normal cost – but at the expense of the investors who have deluded themselves.

The reader who performs simulations of the principal financial parameters, differentiating according to whether the company is using debt or equity financing, should be fully aware that such simulations mainly show the consequences of financial leverage:

- raising the breakeven point;
- accelerating EPS growth;
- increasing the rate of return on book equity;
- degrading solvency;
- affecting liquidity in a way that varies with the term of the debt.

Once the company has decided about the debt/equity mix, the financial manager should focus his attention on the other elements that define the "design" of the capital structure. Design of a capital structure is somehow similar to the definition of "financial architecture" used by Myers (1999, p. 138): "financial architecture means the entire financial design of the business, including ownership (e.g. concentrated vs. dispersed), the legal

form of organization (e.g. corporation vs. limited-life partnership), incentives, financing and allocation of risk."

The most important factors determining the design of the capital structure are the maturity, basis and currency structure. The choices regarding these three aspects can be done following the same principle – the "matching" or "hedging" principle – according to which the optimal design of debt is the one that perfectly matches cash inflows and cash outflows.

QUESTIONS

@ *quiz*

1/ Can a good financing plan make up for a mediocre investment?

2/ What disorder afflicts the investor who mistakes the coupon rate on a convertible bond for its financial cost?

3/ A 17% rate of return is required on a certain asset. The acquisition of that asset is financed entirely by equity. What rate of return do shareholders require on it? If the asset were financed entirely by debt, what rate of return would lenders require on it?

4/ What is the source of financing for which the difference between financial cost and apparent cost is greatest?

5/ Would you advise a startup to seek debt financing? If yes, could it get it?

6/ Is there an optimal capital structure?

7/ Equity capital has two roles in a financing plan. What are they?

8/ Free subscription warrants are distributed to all the shareholders on a one-for-one basis. The value of each warrant is *b*. What is the value of the share after the warrant is detached, other things being equal?

9/ If a shareholder sells the warrant, what is he actually selling?

10/ What difference is there between a big dividend payout and a share buyback of the same amount (a) for the company? (b) for the shareholders?

11/ Which is the fundamental journal article on the subject of capital structure?

12/ In the final analysis, isn't the cheapest financial resource short-term borrowing?

13/ How do you reconcile these two statements:

- "You can't make money without borrowing money."
- "Borrowing can't create value."

14/ Will a company with ample growth opportunities tend to issue short-term, medium-term or long-term debt? Why?

15/ Give two examples of inflation profits. Under what conditions can they occur?

16/ If you believe a finance director's main concern is financial flexibility, would you expect a company ever to use up its borrowing capacity?

17/ Is a company destined always to be financed with equity capital?

18/ Why do startups go through several rounds of financing before they reach maturity? Couldn't they do it with a single big round?

19/ Can an entrepreneur with an industrial strategy be opportunistic in his financing choices over time?

20/ Why did European companies rid themselves of so much debt in 1980–1998? Why did they stop doing it in 1998–2002?

EXERCISES

1/ A company is considering the following investment:

Year	0	1	2	3	4	5
Cash flow	−100	−10	0	0	10	150

which can be financed with equity:

Year	0	1	2	3	4	5
Debt/Equity	30%	22%	22%	22%	22%	22%
EPS	10	8.25	9.1	10.3	11.8	13.6
EPS growth rate		−17.5%	+10%	+13%	+15%	+15%
Rate of return on equity	15%	11%	11%	11.4%	11.6%	12%

or with debt:

Year	0	1	2	3	4	5
Debt/Equity	30%	67%	67%	67%	67%	67%
EPS	10	9.3	10.4	12	14.1	16.5
EPS growth rate	−7%	+12%	+15%	+17%	+17%	+17%
Rate of return on equity	15%	14%	17%	18%	21%	22%

If the cost of capital is 10%, the shareholder-required rate of return is 12% and the cost of debt is 5%, do you think this investment should be financed with equity or with debt? Isn't there another question that should be asked first?

ANSWERS

Questions

1/ *No, because it is very difficult to create value at the level of the financing plan.*
2/ *Myopia, because he is not noticing that holders of convertible bonds expect the share price to rise so that they can convert them.*
3/ *17%, 17%.*
4/ *Internal financing.*
5/ *No, because it would be far too risky for a startup, requiring certain outflows from uncertain inflows. Probably not.*
6/ *No!*
7/ *Providing part of the financing and providing security to lenders.*
8/ *Value of the share less b. The warrant is therefore not free.*
9/ *A share of the value above the exercise price, and of course a time value as well.*
10/ *(a) For the company, none.*
(b) For the shareholder, the individual freedom to receive or not to receive funds from the share buyback, whereas all shareholders receive the dividend.
11/ *Modigliani–Miller (1958).*
12/ *No, no and no!*
13/ *"You can't make money without borrowing money" applies to an investor with a poorly diversified portfolio; it's all or nothing if he goes into debt to leverage it. "Borrowing can't create value" applies to a perfectly diversified portfolio.*
14/ *Short-term, so as to be able to refinance on better terms as growth opportunities become profitable investments.*
15/ *Inventory profits and opportunity profits on investment realised sooner than expected. Provided the inflation rate is higher than the interest rate.*
16/ *No, because the finance director will always want to retain some room to manoeuvre, just in case.*
17/ *No, the less risky it becomes, the more readily it can be financed with debt.*
18/ *In order to profit from a valuation that rises between each round. No, because between each round, investors want to be sure that the business plan is panning out.*
19/ *No, because an industrial strategy can't wait for opportunities to arrive.*
20/ *High real interest rates and low investment. Because virtually all their debt had already been paid off, they could not go on deleveraging.*

Exercise

1/ *The IRR on the investment is 8%, less than the cost the capital. The investment should not be made; the question of how to finance it is academic.*

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