Chapter 29
HYBRID SECURITIES

A bit of magic, or Houdini in the land of financial assets

In the early 1980s many new types of securities made their first appearance in Europe, products of a fertile imagination that drew on parallels in the US and other international financial markets.

Before we begin the study of these different products, we caution the reader to bear in mind the following points.

- Some types of securities offer a lower interest rate in exchange for other advantages to the holder, and therefore give the impression of lowering the cost of financing to the company. It is an error to think this way. **In markets in equilibrium, all sources of financing have the same cost if one adjusts for the risk borne by the investor.** To know whether a source of financing is cheap or dear, one must look past the apparent cost to the overall valuation of the financing. **Only if securities have been issued at prices higher than market value can one say that the cost of financing is indeed lower.**
- With the exception of products that exactly match a particular market demand, these sophisticated hybrid securities are costly to issue and sell. As such, they are a signal to investors that the company, or its majority shareholder, is having trouble attracting investors, perhaps because it is experiencing other difficulties.
- By emphasising the fundamental asymmetry of information between issuer and investor, agency theory and signalling theory are both very useful for explaining the appeal of products of this kind.
- Lastly, it must not be forgotten that corporate finance is not immune to fashion. Investors have a great appetite for novelty, especially if it gives them the feeling of doing high finance!

Hybrid instruments – *essentially bonds with an equity component or "nonordinary" shares* – are found in a multitude of guises. This generic heading encompasses a seemingly endless array of finance instruments, including convertible bonds, mandatory convertibles, reverse convertibles, preferred shares and LYONs.[1] Within each one of these instruments is found a wide range of variations and features. These include reset, negative pledge, screw and forced conversion clauses, as well as stepup coupons, call schedules, call options with soft and hard protection, etc.

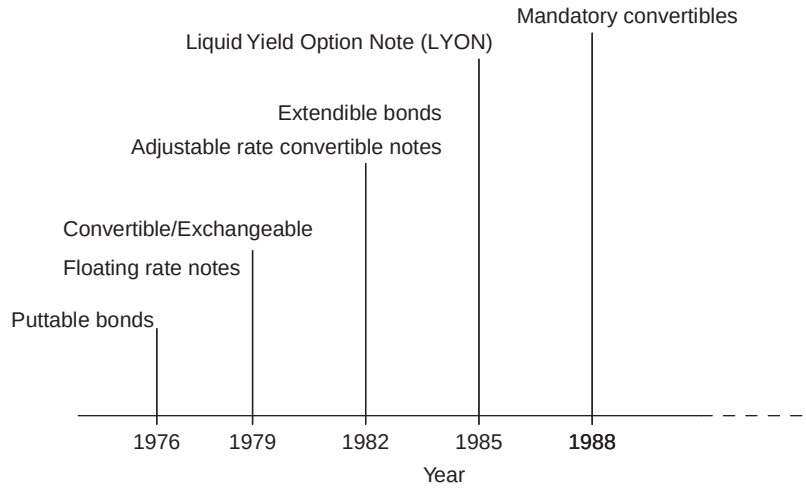
1 *Liquid Yield Option Notes.*

The range of possibilities can seem bewildering, but it is this very flexibility that proves a huge attraction for investors, issuers and financial institutions. On the sell side,

companies issue these securities and corporate service departments advise on the type of options to include in them. On the buy side, investment managers seek to build portfolios with limited risk exposure using these securities and hedge funds to utilise arbitrage opportunities between the convertible bond and the common share. Sometimes (more often than we might think), investors simply hedge part of the features of these products and turn them back to bonds or shares.

We will look first at products with embedded options (warrants, convertible bonds, mandatory convertibles), then at products that offer a preferential return (preference shares, bonds redeemable in shares, investment certificates), and lastly at exchangeable bonds.

HYBRID SECURITIES: THE ORIGINS . . .



Section 29.1
WARRANTS

1/ DEFINITION

A **warrant** is a security that allows the holder to subscribe to another newly issued security (share, bond, or even another warrant) during a given period, in a proportion and at a price fixed in advance.

Subscription warrants may be attached to an issue of shares or bonds, in which case the issue is said to be one of "shares cum warrants" or "bonds cum warrants". Attached warrants to buy shares may be called an "equity sweetener" or "equity kicker". Warrants can also be issued and distributed to existing shareholders at no charge. Once securities with attached warrants have been issued, the whole is split into its two component parts: the shares or bonds become traditional securities, and the warrants take on a life of their own. **The warrants are traded separately after issue.**

As an illustration, the French IT engineering and consulting group Ares issued shares with attached equity subscription warrants in October 2007. Each warrant in that issue allowed the holder to subscribe to one Ares share at €3.61 from 12 November 2007 until 31 December 2008. In June 2008 the Ares warrants were trading at €0.02, whereas Ares shares were trading at €0.93.

As liquidity in the stock and bond markets has increased, financial institutions have taken the opportunity to issue warrants on existing securities independently of the company that issued the underlying shares. These securities are also called **covered warrants** because the issuing institution covers itself by buying the underlying securities on the market.

Warrants ordinarily involve a transaction between one investor and another and therefore play no direct role in financing a business. There being no limits to the imagination, some players have not hesitated in creating warrants on baskets of existing securities (such as indices). Thus, a warrant on a basket of different shares gives one the right to acquire during a given period of time a lot consisting of those shares, in proportions and at an overall price fixed in advance.

2/ VALUE

Conceptually, a warrant is similar to a call option sold by a company on shares in issue or to be issued. The exercise price of this option is the price at which the holder of the warrant can acquire the underlying security; the expiry date of the option is the same as the expiry date of the warrant.

A warrant, however, has a few particular characteristics that must be taken into account in its valuation:

- It normally has a long life (typically 2–3 years),[2] which increases its time value and makes it more difficult to accept the assumption of constant interest rates used in the Black–Scholes model.
- The underlying asset is more likely to pay a periodic return during the time the warrant is held:
    - For an equity warrant, the payment of dividends on the underlying share lowers the value of that share and thereby reduces the value of the warrant. More generally, any transaction that changes the value of the share affects the value of the warrant.
    - For a debt warrant, the price of the underlying bond varies over time and, as we saw in Chapter 25, the closer a bond comes to maturity, the more its market price tends towards its redemption price. Its volatility gradually declines, making the Black–Scholes model, which assumes constant volatility, inapplicable as stated.
- Lastly, in the case of subscription warrants, the dilution associated with exercise of the warrants entails a gradual change in the value of the underlying security. When investors exercise warrants, the number of outstanding shares increases, and the issuing firm receives the strike price as a cash inflow. When investors exercise call options, no change in outstanding shares occurs, and the firm receives no cash.[3]

To get round these difficulties, traders use models derived from the binomial and Black–Scholes models, taking into account the fact that the exercise of warrants can create

2 *But perpetual warrants are not unknown.*

3 *Warrants and convertible bonds also affect accounting numbers because of the increase in the number of shares. This causes the rm's net income to be spread over a larger number of shares, thereby decreasing earnings per share. For this reason, rms capitalised with these instruments must report earnings on both a* primary *and a* fully diluted *basis.*

more shares and thus affect the stock price. This is the case with warrants, management options and convertible bonds. As a general rule, using an unadjusted option pricing model to value these options will overstate their value.

Fortunately, there is a simple and reasonable solution if we want to continue to use the Black–Scholes formula. We must:

1 value a "traditional" call option similar to those of a warrant;
2 then multiply the call value times an adjustment factor for dilution.

If N_1 represents the number of "old shares" outstanding and N_2 represents the number of new shares issued as a result of the warrant being exercised, then the price of the warrant equals the price of an identical call option, C, multiplied by the following dilution factor $(N_1/N_1 + N_2)$:[4]

$$\text{Value of a warrant} = C \times \frac{N_1}{N_1 + N_2}$$

Here is an application to Edison, a key player in the Italian energy sector (and the only Italian company that deals in both the production and sale of electric power and natural gas) as of 11 July 2003.

WARRANT EDISON 04/03–12/07

Amount issued:	1,094,831,000
Number of outstanding shares:	4,079,070,000
Current price of the warrant:	€0.390
Date of issue:	April 2003
Date of maturity:	December 2007
Life to final date:	4.46 years
Risk-free rate:	3.05%
Equity price:	€1.134
Strike price:	€1
Volatility (annualised standard deviation):	43.72%[5]

$$C = 1.134 \times (0.77191636) - 1 \times \left(2.718^{-(3.35\% \times 4.46)}\right) \times (0.42932216) = €0.501$$

$$\text{Dilution factor} = \frac{4{,}079{,}070{,}000}{4{,}079{,}070{,}000 + 1{,}094{,}831{,}000} = 0.788$$

$$\text{Warrant} = €0.501 \times 0.788 = 0.395$$

Agency theory offers an almost "psychological" approach to these hybrid securities. They are seen as a preferred means of resolving conflicts between shareholders, creditors and managers.

4 *How do we obtain the dilution factor? If the warrants are exercised, equity value will increase by the amount of the exercise money to* $E + N_2K$. *So the share price after the warrants exercise will be:*

Share price after exercise $= \frac{E + N_2K}{N_1 + N_2}$

At maturity, the value of the warrants will either be the share price minus the exercise price or zero, whichever is higher. Thus, analytically:

Warrant value at maturity $= \max\left(\frac{E+N_2K}{N_1+N_2} - K, 0\right)$

Warrant value at maturity $= \max\left(\frac{E+N_2K}{N_1+N_2} - \frac{(N_1+N_2)K}{N_1+N_2}, 0\right)$

Warrant value at maturity $= \max\left(\frac{E+N_2K-N_1X-N_2K}{N_1+N_2}, 0\right)$

Warrant value at maturity $= \frac{N_1}{N_1+N_2}\max\left(\frac{E}{N_1} - K, 0\right)$

Take a bond with attached equity warrant as an example. A hybrid security of this kind may seem unnatural since it combines a low-risk asset (bond) with a high-risk asset (share). However, there is something in it for each of the parties.

The company's **managers** benefit from the flexibility that warrants provide, since the company can set bounds on the date of the capital increase (by setting the subscription period of the warrant) and the amount of funds that will be raised (by setting the exercise price and the number of warrants per bond at appropriate levels). The amount of funds raised in the form of bonds can be completely different from the amount potentially raised later in the form of shares. Furthermore, the company may be able to use the funds from both sources for several years since the warrants may be exercised before the bonds are paid off.

A company that wants to accomplish the capital increase part of the issue quickly will set an exercise price barely above, or even below, the current value of the share. If it chooses, it can also move up the beginning of the subscription period. If it prefers to bring in a greater amount of funds, it will increase the number of warrants per bond (which must then have a lower yield to maturity if equilibrium is to be maintained) and/or raise the exercise price of the warrants.

Because it entails selling an option, though, the opportunity cost of a warrant can be substantial. Take the case of a company that has sold for €10 the right to buy one share at €100. Suppose that at the time this warrant becomes exercisable, the shares are trading at €210. A straight capital increase without a rights issue at a very slight discount to the share price would bring in, say, €205 per share, whereas exercise of the warrants will bring in €110 per share all told. The opportunity cost is €95 per share.

Lastly, stock market history has shown that exercise of warrants can never be taken for granted. In the euphoria of the speculative bubble, many Internet companies issued warrants with high exercise prices that were never exercised.

The holders of bonds with attached equity warrants, if they keep both securities, are both creditors and potential shareholders. As creditors, they benefit from a small but relatively certain yield; as potential shareholders, they have hope of realising a capital gain.

In a context of rising interest rates and falling share prices, however, holders of bonds cum warrants suffer the downside risks of both debt and equity securities instead of combining their advantages.

On the other hand, the holders of the bonds may be different from the holders of the warrants. The bonds may end up with investors preferring a fixed-rate security, while the warrants go to investors seeking a more volatile security.

In appearance only, **existing shareholders** retain their proportionate equity stake in the company. The warrant mechanism makes for gradual dilution over time. An issue of bonds with equity warrants allows existing shareholders to maintain their control over the company with a smaller outlay of funds, since they can buy the warrants and resell the bonds. If they do this, the securities they will end up holding will be much riskier overall because the bonds will no longer be there to cushion fluctuations in the value of the warrants.

The dilution problem is postponed, but when the warrants are exercised, they may have risen in value to such an extent that existing shareholders can pay for virtually all of their proportionate share of the capital increase by selling their warrants.

5 *Volatility has been estimated on* daily *trading data over the preceding 3 months. There is no rule about how much data to gather, or about the frequency with which returns should be measured. Daily returns probably portray better the current state of the company and the market, but they may be subject to measurement problems if the stock does not trade frequently. Weekly or monthly returns solve the measurement problem, but require 60 observations so that they may no longer re ect the company's current situation. The returns we have used are* continuously compounded return $ln(P_t/P_{t+1})$ *because the B–S formula assumes continuous compounding.*

3/ PRACTICAL USES

Warrants are increasingly widely used in corporate finance. They are frequently issued in connection with capital increases. They may be distributed free of charge in a number of different situations.

- **A company in difficulty that wants to raise fresh capital.** Before going ahead with a capital increase, the company decides to make a bonus distribution of warrants to existing shareholders. In practice, the shareholders are giving themselves these warrants. They can then speculate more readily on the company's turnaround.
- **When creditors are cancelling debts due to them**, shareholders may give them equity warrants in return. The value of these warrants is virtually nil at the start, but if the company regains its footing, the warrants will rise in value and make up for some or all of the loss on the cancelled debts. A deal of this kind is the way to reconcile the normally divergent interests of creditors and shareholders. In modern finance, this technique replaces the "return to better fortune" clause in loan agreements.
- **In a tender offer** for shares of company A in exchange for shares of company B, shareholders of A may be offered not only shares of B but also warrants for shares of B.
- **In a leveraged buy-out** (LBO, see Chapter 44), warrants may be used to offer an additional reward to holders of mezzanine debt or even to management (another instance of an "equity kicker").

The reader must nevertheless be wary of throwing in "free" equity warrants as a miracle remedy to ensure the success of a deal. It must not be forgotten that warrants entail potential dilution – and that in finance nothing is ever free!

Section 29.2
CONVERTIBLE BONDS

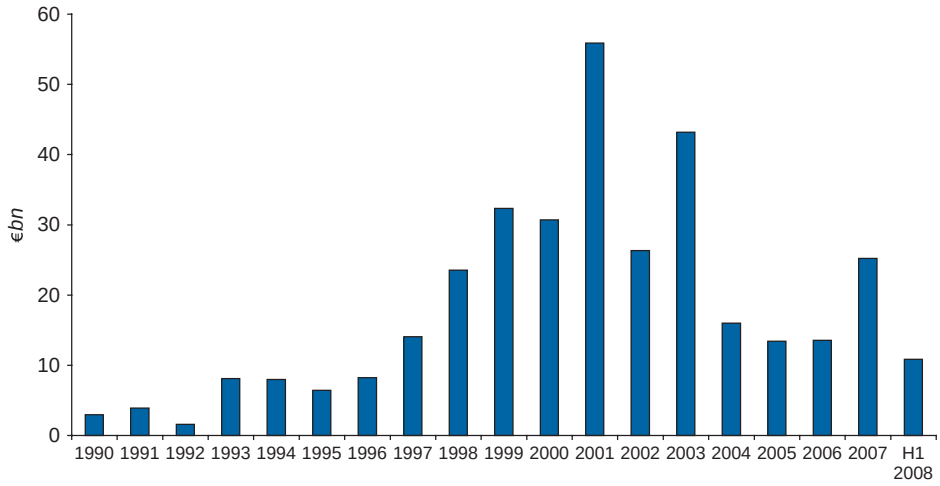
1/ DEFINITION

A **convertible bond** is like a traditional bond except that it also gives the holder the right to exchange it for one or more shares of the issuing company during a conversion period set in advance. A convertible bond is similar to a bond cum warrant. The most important difference is that warrants can be separated into distinct securities and a convertible cannot[6] (directly, that is, but investors can hedge part of the product so in practice the two product are very similar).

This is a financial product of considerable flexibility. The interest rate can be fixed, variable, indexed, floating, adjustable or determined in some other way (also under the form of a zero coupon), and any amortisation schedule can be specified for return of principal.

6 *A convertible preferred stock can be converted into common stocks. The only difference with a convertible bond is that normally it has an in nite maturity.*

ISSUANCE OF CONVERTIBLE BONDS IN EUROPE



The flexibility of convertible bonds explains their great success in Europe, particularly when financial markets are depressed such as in 2001–2003; it seems to grow again in 2007–2008.

As an example, in June 2008 Vilmorin issued a convertible bond with the following characteristics:

VILMORIN JUNE 2008 CONVERTIBLE BOND ISSUE ($150M)

Issue price:	$155.96
Face value:	$155.96
Issue date:	6 June 2008
Maturity:	1 July 2015
Interest rate:	4.50% ($7.0182 coupon)
Redemption price:	$155.96
Conversion ratio:	1 share for 1 bond
Conversion period:	From 6 June 2008 to 22 June 2015
Vilmorin share price at the time of issue:	€129.97

The **conversion period** is specified in the bond indenture or issue contract. It may begin on the issue date or later, It may run to the maturity date, or a decision may be forced if the company calls the bonds before maturity, in which case investors must choose between converting or redeeming them.

The bond may be convertible into one or more shares (1 share for each bond in our example). This ratio, called the **conversion ratio**,[7] is set at the time of issue. The conversion ratio is adjusted for any capital increases or decreases, mergers, asset distributions or distributions of bonus shares in order to preserve the rights of holders of the convertibles as if they were shareholders at the time of issue.

7 *Bond traders also speak of the* conversion price *of a convertible bond, which is calculated as the ratio of the face value of the bond to the conversion ratio.*

The **conversion premium** is the amount by which the conversion price exceeds the current market price of the share. The conversion premium is typical. In our Vilmorin example, the conversion premium is 20%.[8] Since Vilmorin offered no redemption premium, its shares must rise 20% by the maturity date of the bonds for investors to be willing to convert their bonds into shares rather than redeem them for cash. The calculation is slightly different when a redemption premium is involved.

8 *[(155.96/129.97−1)]*

Some convertible bonds are issued with a **call provision** that allows the issuer to buy them back at a predetermined price. Holders must then choose between redeeming for cash or converting into shares. The indenture may provide for a minimum period of time during which the call provision may not be exercised ("hard noncall" period) and/or set a condition for exercising the call provision, such as that the share price has exceeded the conversion price for more than 20 or 30 days ("soft call" provision).

In some cases, the issuer may at conversion provide either newly issued shares or existing shares held in portfolio – for example, following a share buyback.

Convertible bonds must not be confused with the similar-sounding **exchangeable bonds**, which are pure debt securities from the point of view of investors.

2/ VALUE

The value of a convertible bond during its life is the sum of three components:[9]

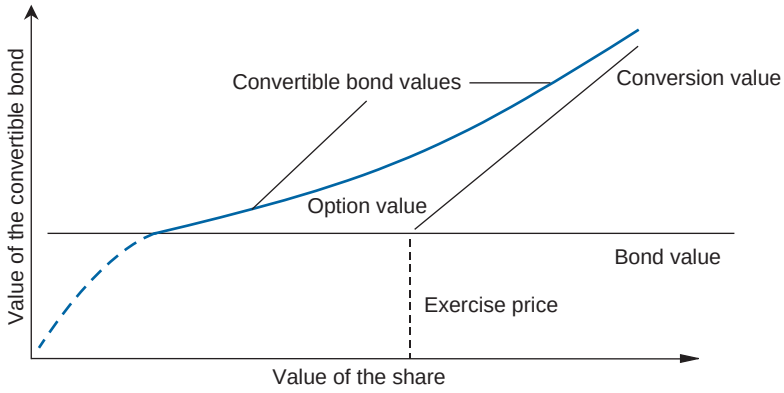
9 *One complication in determining the value of a convertible bond is the* call feature, *typical of nearly all convertibles. The issuer retains the right to redeem the bonds early, either to re nance its debt more cheaply or, more commonly, to force early conversion of an in-the-money convertible. If the issuer calls, bond-holders can convert to equity or accept the call price. The right to call starts some years after issue and often is allowed only if the underlying share is signi cantly in-the-money (for example 30%).*

1. the value of the straight bond alone is called the **investment value (**or just the **bond value**) of the convertible bond. It is calculated by discounting the future cash flows on the bond at the market interest rate, assuming no conversion;
2. the **conversion value**, which is what the bonds would be worth if they were immediately converted in the stock at current market price;
3. the **option value**. The value of convertible generally exceeds both the straight bond and the conversion value because holders of convertibles have the option to wait and convert later on (time value of the option). The option to take advantage of whichever is greater in the future – the straight bond value or the conversion value – raises the value of the convertible over both the straight bond and the conversion value.

Value of a convertible bond
= The greater of (Straight bond or Conversion value) + Option value

When the value of the firm is low, the value of the convertible tends to be mostly influenced by the value of the straight debt. The opposite happens when the value of the firm is very high: the value is mostly influenced by the conversion value. Graphically, we have:

VALUE OF A CONVERTIBLE BOND



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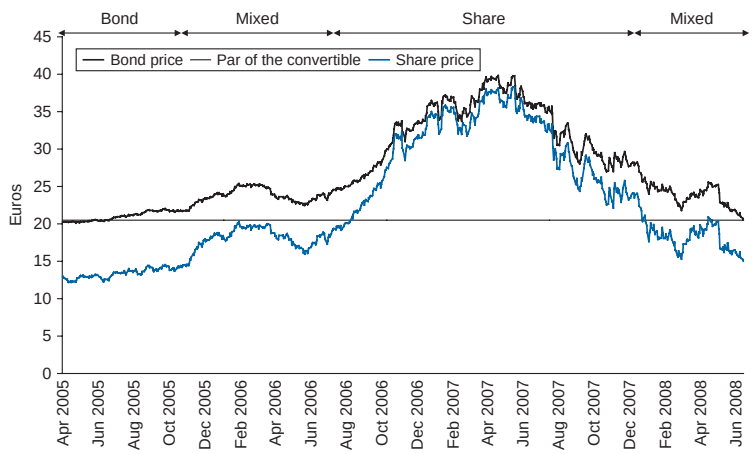
The attractiveness of convertible bonds to some investors is given by its "defensive" quality, since the bond value provides a *oor* to the price of the security while giving the opportunity for price appreciation if the underlying stock rises. The bond value thus represents a minimum value: the convertible will never be worth less than this floor value, even if the share price falls significantly. It also cushions the impact of a falling share price on the price of the convertible. Bear in mind, though, that investment value is not a fixed number but one that varies as a function of changes in interest rates.

EXAMPLE OF A CONVERTIBLE BOND – AIR FRANCE KLM



The convertible issued by Air France KLM in April 2005 behaved like a bond when first issued, but from October 2006 until October 2007 it had become virtually indistinguishable from the share. Since the share price fell the convertible has behaved more like a mix of the share and the bond.

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Whenever the share price is well above the redemption value of the convertible, as in the "share" zone of the chart above, the convertible behaves more and more like the share because the probability that it will be converted into shares is very high.

In the "bond" zone, the convertible behaves essentially like a bond because, given the level and trend of the share price, the probability of conversion is low. The price of the convertible is close to its investment value.

In the "hybrid" zone, the value of the convertible reflects the simultaneous influence of both the level of interest rates and the price of the underlying security.

There can also be a high-risk zone for the convertible if the share price has fallen sharply. Grave doubts appear as to the company's ability to repay its debts. The price of the convertible adjusts downward accordingly, until it offers a yield to maturity consistent with the risk of default by the issuer.

3/ THEORETICAL ANALYSIS

Unlike a bond with attached equity warrants, a convertible bond is an indivisible product. The straight bond cannot be sold separately from the call option.

For the investor, the convertible bond is often presented as a miracle product, with downside protection by virtue of its debt component and upside potential by virtue of its equity component.

In much the same fashion, the convertible bond is pitched to issuers as the panacea of corporate finance. Initially, it enables the company to issue debt at an interest rate lower than the normal risk-adjusted rate; at a later point, it may enable the company to issue fresh equity at a price higher than the current share price.

No, there are no miracles in finance. At best, one can find mirages, and this is one. If the company is able to issue bonds at an interest rate below its normal cost of debt, it is because it has agreed to issue shares in the future at a price (€155.96 in our Vilmorin example) *below* the share value at that time – necessarily below, or conversion would not take place. *Current shareholders will therefore be diluted on poor terms for them*.

Similarly, if the investor is getting a call option on the share, it is because in return he accepts a lower rate of return on the bond than the issuer-specific risk would justify.

The apparent cost of the convertible bond is low only because its true cost is partly hidden. The company is selling investors call options, which they pay for by accepting a lower interest rate on the bonds than the company could normally obtain given its risk.

The cost of a convertible bond may be calculated in intuitive fashion as a weighted average of the cost of equity and the cost of debt. The weighting corresponds to the probability that the convertible will actually be converted. This probability is not hard to estimate if one assumes that returns on the share are normally distributed.

Equilibrium market theory is not of much help in explaining why convertible bonds, which are no more than a combination of two existing products, should themselves exist. Unsurprisingly, agency theory and signalling theory – together with the "matching hypothesis" – are far more useful in understanding the usefulness of convertibles.

- According to **agency theory**, a convertible bond is a mode of **resolving conflicts between shareholders and creditors**. The temptation of managers of leveraged companies is to undertake risky investments that increase shareholder wealth at the creditors' expense. With this fear in mind, creditors refuse to finance the company except via convertible bonds. Creditors will then have some protection, since the convertible gives them the option of becoming shareholders if there are transfers of value working against them as creditors. A heavily indebted company may have to pass up highly profitable investment projects if it cannot obtain bank financing that would not put too great a strain on its cash flow at the start. With its low apparent interest cost, the convertible bond is an attractive alternative. A convertible bond also helps in **resolving conflicts between shareholder-managers and outside shareholders.** A shareholder-manager of a company with convertible bonds outstanding will hesitate to divert company resources to private use at the expense of other shareholders, since

he knows that would increase the probability of having to redeem the convertibles in cash. If the company is already carrying a sufficiently high debt load, redemption could put it in difficulty and threaten the manager's position, so he is deterred from taking such action.

- **The "matching" hypothesis** provides another contribution to the explanation of why convertible bonds exist. A young, fast-growing company or one with limited financial resources will avoid taking on too much debt, as its cash flow is likely to be highly variable and its cost of debt, given its short history, likewise high. In these cases, it makes sense to issue securities whose cash flows **match** those of the firm.
- A fast-growing company will have little inclination to issue more shares, either because it believes its shares are undervalued or because it **fears sending out a negative signal** (see Chapter 39). That leaves only convertible bonds. Investors, relieved that the signal associated with a capital increase has not been sent, will welcome an issue of convertibles. This is what the **signalling theory** assumes.

Taken together, these three explanations provide good reasons for issues of convertible bonds by smaller companies that are growing rapidly, are already heavily indebted or have assets that are quite risky. We could also add another explanation, which is commonly known as the **"backdoor equity" hypothesis.** Young, growing firms cannot usually issue debt because of the high financial distress costs. At the same time, they may be unwilling to issue equity if current stock prices are too low. Thus, convertible bonds could offer a good compromise solution. Convertible bonds cause expensive dilution, but it occurs when the firm can afford it![10]

The market for convertibles is also supplied by large groups, which use it to raise funds from specialised investors that invest only in convertible bonds. For these large groups, convertibles offer **a way of diversifying the investor base** and raising money in large quantities more easily. Lastly, groups in financial difficulty will resort to issuing convertibles when the equity market is closed to them, as was the case for Vilmorin.

4/ TAXATION

The tax treatment of convertible bonds favours the investor since it is the same as for other bonds. As well as this tax advantage, convertibles offer a means of rewarding financial investors when shareholders are unwilling to have the company pay dividends.

With those convertibles (such as a French *Océane*) for which the issuer can provide either new or existing shares, a tax problem may arise when the latter are used. The "sale" of shares held on the company's balance sheet is considered a disposition for tax purposes, and the company will owe tax on any capital gain. If the company issues new shares, no tax is owed.

10 *A similar rationale is offered by Mayers (1998). If a company has many real options it needs the capital in "two stages": the first stage is used to prove that the real investment options may be worth pursuing; the second, to exploit the option effectively. Corporations may prefer to use convertible debt because it can be designed in such a way that investors can "exercise" (or be "forced" to exercise through call options) their real options only if they turn out to be valuable, or abandon the conversion option if the real option disappears (thus avoiding the overinvestment problem of companies with high liquidity and no good investment opportunities).*

Section 29.3
PREFERENCE SHARES

The securities called **preference shares** (a definition prevailing in the United Kingdom) or **preferred shares** (a definition prevailing in the United States) enjoy economic advantages over ordinary shares, typically in return for a total or partial absence of voting rights.

1/ DEFINITION

Preference shares are created on the occasion of a capital increase by the decision of the shareholders at an (extraordinary where applicable) general meeting.

The advantages conferred on preference shares may include:

- a claim to a higher proportion of earnings than is paid out on other shares;
- priority in dividend distributions, meaning the dividend on preference shares must be paid before any ordinary dividend is paid on other shares;
- a cumulative dividend, so that if earnings are insufficient to pay the preference dividend in full, the amount not distributed becomes payable from future earnings;
- a firm cannot go in default if it misses paying some dividends;
- rating agencies and financial analysts consider preference shares as a part of equity (thus improving the rating of the company).

At the same time, there are two important disadvantages in issuing preference shares.

- for the issuer – because the dividends are generally non-tax deductible;[11]
- for the investors – because they have limited voting rights.

11 *This is not always true. In the United States, for example, companies do not have to pay taxes on 70% of the preferred dividends they receive on preference shares investment they have made in other rms. This tax saving might then be shared with the issuing company, enabling the company to bring the preferred dividend rate down.*

We should note here that the term "preferred securities" (often shortened to just "preferreds"), is much broader in scope and may encompass convertible bonds and subordinated debt securities as well as preference shares without voting rights. The reader is advised to look closely at the detailed characteristics of any security called a "preferred" and not to assume that it is necessarily a preference share.

Special features can be added to preference to make them more attractive to investors or less risky to issuers:

- **adjustable rate preference share**: the dividend rate is pegged to an index rate, such as a treasury bill or treasury bond;
- **participating preference share**: the dividend is divided in a fixed and a variable component. The latter is generally set as a function of earnings;
- **trust preference share**: the dividend on these stocks is tax deductible like interest expenses. Firms issuing this security get the tax shield of debt and keep leverage low (because preference shares are treated like equity by analysts and rating agencies).

2/ VALUE

Valuation of preference shares follows the same principles as valuation of ordinary shares, but the flow of dividends is greater and more certain.

Let's suppose we want to calculate the value of a *perpetual preferred stock*. The formula is similar to that of a perpetuity:

$$V_{preferred} = \frac{\text{Annual dividend}}{\text{Expected dividend yield}}$$

An approach of this kind will normally give a higher market value for the preference share than for the ordinary share. What is frequently observed, however, is a discount in the value of the preference share compared with the ordinary share. The origins of this discount are the lesser liquidity of the secondary market in preference shares and the limited voting rights belonging to this category of shareholders.

3/ THEORETICAL ANALYSIS

(a) For the company

Preference shares can enable a company which is in difficulty but has a good chance of recovering, to attract investors by granting them special advantages.

Banks are often issuers of preference shares because these securities are classified by central banks as part of the bank's own funds for the purpose of determining its net capital. This is so even though the preference share pays a constant annual dividend expressed as a percentage of par value, which gives it a strong resemblance to a debt security. Analysts are not fooled; for their purpose, preference shares are reclassified as debt.

Against these advantages, preference shares also present several drawbacks:

1 They cost more than a traditional capital increase: the preference dividend is higher than the ordinary dividend, whereas the preference share itself is usually worth less than the ordinary share because of its lesser liquidity.
2 Their issuance entails complications that are avoided with an ordinary capital increase, such as calling a special shareholders' meeting.
3 Furthermore, understanding such issues can be quite difficult. Preference shares frequently trade at a steep discount to theoretical value because holders demand a big premium over market value before they will sell or exchange them.

(b) For current shareholders

For current shareholders, issuing preference shares makes sense only if those shares have no voting rights. When this is true, a capital increase can be accomplished without diluting their control of the company. A company with family shareholders may issue preference shares in order to attract outside financial investors without putting the family's power over the company in jeopardy.

But this advantage brings with it an additional cost for current shareholders and so appears to us quite illusory over the long term. It is just as if the company's cost of equity had been raised.

In France, for example, one finds a class of securities called nonvoting **priority dividend shares** (*actions à dividende prioritaire* or ADP) that must obey some very specific restrictions: they can represent no more than one quarter of the company's authorised capital; their voting rights must be restored after three years with no dividend; and the issuer must have the right to buy them back. Similar characteristics are shared by Italian "*azioni privilegiate*" and partially by the "*azioni di risparmio*" (saving shares).

Today this product has virtually disappeared from stock markets, which prefer to see a single quoted share class for each company traded in substantial volume. These securities cease to exist either when the issuing company is taken over by another or when it offers to exchange the priority dividend shares for ordinary shares.

On the other hand, preference shares remain useful as a vehicle for financial investments in unlisted companies (particularly in LBOs) or in cross-border business combinations, as a means of equalising dividend flows between different shareholders in dual listed companies, as in the case of Reed-Elsevier.

4/ BETWEEN PREFERENCE SHARES AND CONVERTIBLE DEBT: CONVERTIBLE PREFERRED STOCKS

Recent financial innovation has introduced a new distinct class of securities – convertible preferred securities – which are designed to provide issuers with the dual benefits of maintaining the dilution-limiting benefits of convertible debt while providing significant rating agency, balance sheet and, (in limited cases) regulatory equity content. In addition, all classes of convertible securities can be structured such that issuer interest payments are tax-deductible.

Their main characteristics are: (1) deep subordination; (2) long-dated maturity; (3) multiyear dividend/interest deferral; (4) various common stock conversion features.[12]

12 *Given these features, the after-tax cost of these securities tends to be higher than "normal" convertible debt.*

Within the convertible preferred stock category, there are two primary security types:

- **Conventional convertible preferred**. Typically structured as either perpetual or 30-year preferred stock.
- **Mandatory convertible preferred stock**. Short-maturity preferred securities that automatically convert into common stock at maturity.

An important attribute of these securities is the amount of "equity" that rating agencies assign to the product. S&P tends to view this equity in percentage terms while Moody's assigns content in distinct groupings. The factors that influence the "amount" of equity are the followings:

- the type of equity-linked product being used;
- the amount of other hybrid equity products on the issuer's balance sheet;
- the industry or sector of the issuer;
- management credibility.

Here is a spectrum of convertible alternatives:

		CONVERTIBLE PREFERRED			CONVERTIBLE DEBT			
Products	Common stock	Mandatory convertible	Convertible preferred	Hybrid preferred securities	Convertible debt	Moderate high premium convertible debt	Zero coupon convertible debt	Straight debt
Certainty of conversion	Certain	Certain/High		High		Medium	Very low	None
Rating agency equity treatment	100%	Partial equity treatment			0%			

The reader may wonder why subordinated securities have been more successful than preference shares which have fairly similar features. We believe that there are two main reasons:

- The first is the fact that interest on subordinated debts is tax deductible, unlike dividends on preference shares.
- The second is the investors likely to be interested in these products do not have the same investor profile as those keen on preference shares. Subordinated securities

are mainly placed with long-term investors (insurance companies, private banking clients) who are seeking attractive returns over the long term. Such investors are relatively indifferent to the low liquidity of the security (a feature subordinated securities and preference shares have in common).

On the other hand, recent history has shown that preference shares were difficult to value, difficult to get rid of if necessary and often heavily discounted because of their reduced liquidity compared with ordinary shares. Increasing the different types of bonds results in a better breakdown of demand from bond investors, which means they can be issued in better conditions. Increasing the different types of shares has the opposite effect, by reducing the liquidity of each line, when liquidity is the watchword of many investors in equity and not the chief concern of investors in bonds.

Subordinated securities seem to have found their place on the market. They are issued by companies seeking to strengthen their financial solidity without diluting their shareholdings and they come with a tax break. They are bought by long-term investors who are seeking comfortable returns but are prepared to take a certain amount of risk and to sacrifice the liquidity on their investment.

Section 29.4
OTHER HYBRID SECURITIES

Financial innovation has reduced the difference between the investment characteristics of debt and equity. Firms are able to issue securities that function very much like equity but which are frequently treated as debt for tax purposes. Much of this innovation represents "equity in drag" (Bulow et al., 1990). Innovation has in fact eroded each of the traditional tests used for distinguishing debt and equity.

The criteria by which we can show the disappearing distinction between debt and equity are the following:

1 **Debt–equity ratios**. It can be observed that the high yield (or speculative) debt – i.e. debt issued by companies with very high leverage and a rating below BBB – has a strong positive correlation with equity while the correlation is very low or even negative with government bonds:[13]

	EMU government bonds indexes			European DJ EuroStoxx indexes		
High Yield European Issuers	3–5 years	10+ years	All Maturities	EuroStoxx 50	EuroStoxx	EuroStoxx Small
High-Yield (All)	−1.4%	7.6%	2.2%	47%	50%	59%
European high-yield BB	−11%	−15%	−12%	59%	63%	73%
European high-yield B	−16%	−18%	−17%	61%	66%	78%

13 *The correlation coef cients have been calculated using monthly returns over the preceding 5 years.*

Correlation coefficients consistently show that straight noninvestment-grade bonds trade nearly as much like stocks as pure debt instruments. From the investor's standpoint, this evidence implies that there is a sizeable equity component in high-yield debt.

2 **Subordination**. The seniority hierarchy has become less clear with leveraged-buyout operations, where numerous levels of seniority can be used.

3 **Unconditional promise to make fixed money payments**. Recent innovations in the debt market (pay-in-kind securities,[14] zero coupon bonds, etc.) have circumvented an important characteristic of "traditional debt" – that is, the promise to make regular cash payouts, the omission of which would trigger a default.

4 **Convertibility into the stock of the corporation**. The conversion option introduces a crucial element of equity-type into debt contracts.

5 **Relationship between holding of the stock and the debt security**. The key distinction between debt and equity is that creditors should have interests that diverge from those of equity holders. However, some placement techniques – like the so-called "strip financing" – reduce this distinction because each financial claimant of a company holds a portion both of debt and equity.

14 *Pay-in-kind securities give the issuer the option either of paying interest in cash or in additional securities, valued at par.*

1/ MANDATORY CONVERTIBLES

Unlike convertible bonds, for which there is always some risk of nonconversion, **mandatory convertibles** are **necessarily** transformed into equity capital (unless the issuing company goes bankrupt in the meantime) since the issuer redeems them by delivering shares; no cash changes hands at redemption.

Mandatory convertibles are hybrid securities, which automatically convert into a predetermined number of shares dependent on the stock price at the time of conversion. They are closer to equity than debt because they redeem in shares instead of cash, and provide little downside protection (just the coupon payments). In addition, mandatory convertibles are often treated as equity on the balance sheet and regarded as equity by the rating agencies.

Mandatory convertibles are more established in the US than in Europe. They have emerged primarily as an opportunistic response to uninviting market conditions for direct equity issuance and have helped companies deleverage their balance sheets.

Mandatory convertibles appeal to investors looking for high yield and capital appreciation, although they have less downside protection than standard convertible bonds. As a result, we see interest from equity funds and outright investors but the main investors are hedge funds because they are able to significantly offset stock exposure.

In view of the ongoing pressure on corporates' balance sheets and the need to refinance upcoming redemptions, it is reasonable to expect further interest in mandatory convertible securities.

The value of a bond redeemable in shares is the present value of the interest payments on it plus the present value of the shares received upon redemption. In pure theory, this is equal to the value of the share increased by the present value of the interest and decreased by the present value of the dividends that will be paid before redemption. The discount

rate for the interest is the required rate of return on a risky debt security, while the discount rate for the dividends is the company's cost of equity.

For tax purposes, bonds redeemable in shares are treated as bonds until they are redeemed and subsequently as shares.

In recent years there has been a revival for mandatory convertibles and new features have been added to make this product more attractive for investors.

Mandatory convertibles are equity-linked hybrid securities such as PERCS (Preferred Equity Redemption Cumulative Stock) or DECS (Debt Exchangeable for Common Stock, or Dividend Enhanced Convertible Securities),which automatically convert to common stock on a prespecified date.

Mandatory convertibles have been designed with a variety of payoff structures, and carry different names depending on their payoff structure and the investment bank underwriting their issue: examples are Morgan Stanley's PERCS and PEPS, Merrill Lynch's PRIDES, Salomon Brothers' DECS, and Goldman Sachs' ACES (for an explanation of these abbreviations see Chemmanur et al., 2003).

They have been issued by a number of companies, large and small, to raise capital: these include Texas Instruments, General Motors, Citicorp, Sears, Kaiser Aluminium, Reynolds Metals, American Express, First Chicago, Boise Cascade, and All State. Two big issuers were AT&T and Motorola, which in 2001 raised $900 million and $1.2 billion, respectively, by selling mandatory convertibles; from 2004, GE also sold down its branch Genworth Financial through such products. In Europe, Lafarge used a similar product, a bond redeemable either in shares or in cash, when it acquired Blue Circle. This issue was in reality a capital increase conditional on the success of its bid for the target company. Legally, capital increases can never be conditional. This is also the structure used by AXA in 2003.

2/ DEEPLY SUBORDINATED DEBT

These financial instruments present the four following features, which are also presented by ordinary share capital and provide the undertaking with financial flexibility.

1 **Permanency**: the instrument must be perpetual, and early redemption features must be under the sole control of the issuer.
2 **Ranking**: in case of liquidation, the securities must rank senior only to share capital.
3 **Conditional payment of interest**: under certain conditions, such as non-payment of dividends to shareholders, payment of the coupon/dividend to investors must be left at the issuers' entire discretion. Such non-payment must not be considered as a default event, but as a cancellation of the remuneration, with no deferred remuneration (noncumulative coupon). Moreover, should the payment endanger the solvency soundness of the undertaking, the non-payment must be compulsory. Step-up remuneration clauses are forbidden.
4 **Loss absorption mechanism**: the securities must give the issuer the ability, in addition to the non-payment of interest, to absorb potential losses by a reduction of the nominal value of the securities, in order to pursue its activity.

3/ TRACKING STOCKS

A **tracking stock** is an issue of shares for which performance is indexed to the earnings of a subsidiary or division. Tracking stock is technically a class of the parent company's shares. It confers no right to vote on the decisions of the subsidiary that it supposedly represents. If the business is sold, however, the holder of tracking stock shares has the right to receive a portion of the capital gain.

There are three main reasons for issuing tracking stocks:

1 they allow investors to buy only those portions of the firm that they feel have the greatest potential or value;
2 they provide more transparency to investors on how well the firm is doing in different businesses;
3 they enable a company to retain full control of a subsidiary while allowing the market to establish a value for it, thereby providing a ready currency for acquisitions.

This type of security is relatively well developed in the United States but extremely rare in Europe.

The value of a share of tracking stock is theoretically equal to what a share of the subsidiary would be worth if it were publicly traded. However, in the absence of effective control over the subsidiary, the legal complexity and the often low liquidity generally result in a sharp discount to the theoretical value.

However, while the positive announcement returns of tracking stocks are well documented, an examination of their post-issue market performance is lacking. Billett and Vijh (2000) document three key results:

1 Tracking stocks earn significantly negative buy-and-hold excess returns during a 3-year period following the issue date. The authors find significantly negative returns surrounding the earnings announcements during this period. This evidence contrasts with the post-issue returns of spinoffs, which are known to be positive, and of carveouts, which are known to be insignificant.
2 Contrary to a common justification given to adopt tracking stocks, they do not increase the transparency of firm earnings.
3 There is a large positive announcement period for returns to events resulting in the elimination of tracking stock structure.[15]

It is no surprise that this type of security came into being during a period of bull market euphoria. A tracking stock is often the precursor of a spin-off or demerger.

From a conceptual viewpoint, one might well ask whether shares of tracking stock represent minority interests or whether they are just another means of financing for the parent company, like ordinary shares or bonds. Although legally the securities are issued by the parent company, we think tracking stock has more to do with minority interests than with direct financing instruments. However, a proposition of this kind must be nuanced according to the particular characteristics of each issue.

Amid claims of better performance and higher market value, tracking stocks also raise an important ethical question because one board of directors controls both the parent company and the parent stock. But will it always act in the best interest of the tracking stock? Allocation of capital is an important conflict of interest that may arise with tracking

15 *Clayton and Qian (2003) have found less pessimistic evidence. Overall their study suggests that the wealth gains due to the announcement effect are permanent and underestimate the total wealth gains from the issue of tracking stock. Although the long-run after-transaction performance of tracking stocks is weak, it is not signi cantly below any of the benchmarks. They also investigate the relative long-run performance of the rm before and after the issue of tracking stock. The evidence is that the parent stock and the combined rm perform better in the three years following a tracking stock issue than the three years prior to the announcement. Finally this study investigates the ex-day returns for tracking stocks. There is a signi cant positive ex-day return of 8.79%. Tracking stocks seem to produce even greater wealth gains than previously thought due to the announcement effect.*

stocks. The high-growth unit with the tracking stock may need a lot of capital. In case of external capital rationing, should the capital come from the slower-growing but cash-rich more mature company? Investors typically value cash-cow divisions and companies on the basis of their cash flows. If these flows were diverted to other divisions, investors could be justifiably upset.

4/ EXCHANGEABLE BONDS

An **exchangeable bond** is a bond issued by one company that is redeemable in the shares of a second company in which the first company holds an equity interest. Thus while a convertible bond can be exchanged for specified amounts of common stock in the issuing firm, an exchangeable bond is an issue that can be exchanged for the common stock of a company other than the issuer of the bond.

At maturity, two cases are possible. If the price of the underlying shares has risen sufficiently, holders will exchange their bonds for the shares; the liability associated with the bonds will disappear from the first company's balance sheet, as will the asset associated with the shares. If the price has not raised enough, holders will redeem their bonds for cash, and the first company will still have the underlying shares. In neither case will there be any contribution of equity capital. An exchangeable bond is therefore like a collateralised loan with a call option for the holder on securities held in the company's portfolio.

For the investor, a bond issued by company *X* that is exchangeable for shares of company *Y* is very close to a convertible bond issued by *Y*. The only thing separating these two financial instruments is the default risk of *X* versus that of *Y*.

By way of example, in May 2008 KfW (a German state-owned bank) issued a bond exchangeable for shares in Deutsche Telekom (for a total of 4.6% of the telecom access provider's equity) in which KfW held a stake of about 16.9%. Bonds are exchangeable with shares with a premium of 27.5% for 5 years 1 month. This issue raised €3 billion million for the group at an apparent interest rate of just 3.5%, so 1% less than the German Bunds rate at the same time. The *quid pro quo* is obviously twofold: for one thing, KfW cannot be sure of having unloaded a part of its holding in Deutsche Telekom; for another, if it does succeed in disposing of that stake, it will have let it go at a price below its market value.

SUMMARY

@ *download*

Hybrid securities often seem to be equity, but that is not always the case. A convertible bond that is not converted remains a debt; a bond with attached warrants is likewise still a debt.

Many of these hybrids give the impression of lowering the company's cost of financing. Do not believe it! In markets in equilibrium, all sources of financing have the same cost when adjusted for the risk taken by the investor. It is not enough to look only at the apparent cost; the full cost of any source of financing must be understood and taken into account.

Similarly, these securities give the impression of belonging to the world of high finance. More often than not, though, their use is a sign that the issuer is in trouble or is having difficulty placing ordinary equity or debt securities with investors.

Agency theory explains the existence of these products by showing their usefulness in resolving potential conflicts between shareholders and creditors or between shareholder-managers and outside shareholders. Signalling theory sees in them the mark of an undervalued, heavily indebted company that is unwilling to finance itself through a traditional capital increase.

A convertible bond is like a traditional bond, generally one bearing a fixed rate, except that it also gives the holder the right to exchange it for one or more shares (depending on the conversion ratio) of the issuing company during a conversion period set in advance. Its value is analysed as the sum of the value of the traditional bond and the value of a call option on the shares with an exercise price equal to the conversion price.

Convertible bonds are issued at lower coupon rates than traditional bonds. This is not an advantage for the issuing company but merely the compensation for the call option it has granted the investor "at no charge".

A subscription warrant is a security that allows the holder to subscribe during a given period, in a proportion and at a price fixed in advance, to another security. A subscription warrant may be attached to an issue of shares or bonds or distributed by itself "at no charge". Conceptually, a warrant is a form of call option sold by the company on shares to be issued. Issuing warrants enables a company to accomplish a capital increase by a process of gradual dilution.

Preference shares, bonds redeemable in shares, investment certificates and tracking stocks are other categories of hybrid securities.

QUESTIONS

@ *quiz*

1/ Can any financial product normally make it possible to obtain resources at below market cost?

2/ Define: convertible bond, bond with equity warrants, preference share, investment certificate and bond redeemable in shares.

3/ The bond market yield is 7%. A company issues a bond with equity warrants at a gross yield to maturity of 3% assuming the warrants are not exercised. What is the cost of this product? What is the breakdown of that cost?

4/ Is a convertible bond more costly to the issuing company than a bond with equity warrants?

5/ Which is (are) the most appropriate financial product(s) for the following companies:

- a company that wants to raise fresh equity capital immediately but does not want to risk losing control;
- a company that wants to raise fresh equity capital immediately in which the state is the majority shareholder;
- a company with a very volatile share price that wants to gradually broaden its shareholder base;

- a company emerging from a period of difficulties whose future is still perceived by investors to be risky.

6/ Rank convertible bonds, investment certificates, bonds with equity warrants, preference shares and new ordinary shares in terms of:

- actual or potential dilution;
- achieved rate of return;
- potential capital gain;
- cost to the issuing company.

7/ Which product would *appear* to be a case of "tails I win, heads you lose"?

8/ Show that if managers think their company's shares are undervalued, there is a better product to issue than a convertible bond.

9/ Show that if managers think their company's shares are overvalued, there is a better product to issue than a convertible bond.

10/ Given your answers to Questions 8 and 9, how do you explain the existence of convertible bonds?

11/ True or false:

(a) The higher the conversion premium, the higher the yield on a convertible bond.
(b) The higher the volatility of the underlying share, the higher the conversion premium.
(c) A rise in the payout ratio on the underlying share increases the probability of conversion before a convertible bond matures.
(d) A convertible bond does not offer the same percentage of upside participation in the share price as the share itself, but in return it offers downside protection.

12/ Why isn't a bond redeemable in shares attractive to financial investors?

13/ Why is there a good chance that preference shares will be worth less than the same issuer's ordinary shares, despite the preferences accorded to them?

EXERCISE

1/ Company *X* has capital of 2 million shares that are currently trading at €2000 per share. On its balance sheet it has a liability for an issue of convertible bonds with the following characteristics:

- nominal value: €500m (500,000 convertible bonds of face value €1000 each);
- interest rate: 5%;
- conversion ratio: 1 for 1;

Company *X* expects to have net profit of €300m next year.

(a) Calculate *X*'s *fully diluted* earnings per share. The corporate income tax rate is 36.7%.
(b) Redo the same exercise, replacing the convertible bond with a bond with attached warrants to subscribe to one share of *X* at €2100. Assume the pre-tax rate of

return on short-term investments is 8%. Use two different methods to make your calculations.

(c) What would be the result of the calculation in (b) above if *X* issued the bond with warrants to pay off another borrowing at a pre-tax interest rate of 8%? Assume that the expected net profit is after interest expense on the previous borrowing.

ANSWERS

Questions

1/ *Normally no.*
2/ *See definitions in this chapter.*
3/ *One cannot say what the cost of this product is; the most one can say is that the cost consists of a minimum rate plus an option.*
4/ *There is no basis for affirming that either one is more costly than the other.*
5/ *Preference shares (but no one is fooled); investment certificates; convertible bonds; convertible bonds.*
6/ *In descending order of dilution: preference shares, investment certificates, ordinary shares, convertible bonds, bonds with equity warrants. In descending order of return: convertible bonds, bonds with equity warrants, preference shares, investment certificates, ordinary shares. In descending order of potential capital gain: ordinary shares, preference shares, investment certificates, bonds with equity warrants, convertible bonds. The cost to the company depends on the pricing!*
7/ *Convertible bond.*
8/ *Traditional bond that will be paid off by a capital increase once the share price has risen.*
9/ *Ordinary shares that will never have to be redeemed.*
10/ *By agency theory and signalling theory.*
11/ *True: b and d; false: a and c.*
12/ *Because it is simply a forward purchase of shares, payable immediately.*
13/ *Because of their lower liquidity; there are many fewer of them than there are of the ordinary shares.*

Exercise

(a) Saving on interest costs (after tax at 36.7%): €15.83m. Fully diluted EPS = €126.3.
(b) Invest proceeds at short term: fully diluted EPS = €141.3. Use proceeds to buy back shares: fully diluted EPS = €151.9.
(c) Gain on interest expense: (8% − 5%) × 0.6333 × 500 = €9.50 m; by the short-term investment method: fully diluted EPS = €145.1; by the share buyback method: fully diluted EPS = €156.7.

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