## The $\mathrm{P} / \mathrm{E}$ ratio

The price/earnings ratio (P/E) has long been one of the most popular measures of equity value. It states the ratio of the market price of a company to its earnings, i.e. current value as a multiple of earnings. P/E is used to compare prices of companies, sectors or markets at the same point in time, or assess price developments over a period of time. $\mathrm{P} / \mathrm{E}$ is calculated either on the basis of earnings over a period in the past or forecast earnings in the future. Independent analysts and information services generally present $\mathrm{P} / \mathrm{E}$ based on the most recent figures for past earnings. Many companies, however, experience profit fluctuations or are undergoing growth with the prospect of major changes in profit but also great uncertainties. Investors therefore project future earnings on what they consider to be realistic assumptions, which means that $\mathrm{P} / \mathrm{E}$ is considered to have a fairly unreliable basis. Its usefulness lies above all in enabling comparisons between companies which are considered to have similar potential for generating future profits, e.g. those in the same sector with similar external environments. An exceptionally high or low P/E may conceivably be interpreted as showing that the price is based on unrealistic future growth expectations, thus indicating that it is either overpriced or in a "clearance sale," although such an interpretation is not the only possible one. However, historical figures for the USA suggest that a high $\mathrm{P} / \mathrm{E}$ is a statistically significant precursor of low returns over the following 10 years and vice versa. ${ }^{1} \mathrm{P} / \mathrm{E}$ in developed equity markets was generally in the range 20-30 in 1999, but Japan was in a class of its own with 68 . These are very high figures relative to the average over the past 20 years.
$\mathrm{P} / \mathrm{E}$ is often presented as a function of only two variables, required rate of return and expected earnings growth. This can be derived from the traditional presentation of equilibrium in the equity market as the market price of a share being equal to its fundamental value. Fundamental value is the current value of future income flow from the share, i.e. cumulative future dividend payments over and above the yield required from it. This produces a simple equation for $\mathrm{P} / \mathrm{E}$ if it is also assumed that expected earnings growth and risk premium remain unchanged for the lifetime of the investment. At any given time,

$$
P / E=d(1+g) /(r-g) \quad \text { (the Gordon equation) }
$$

where $d$ is the ratio of earnings paid out as a dividend, $g$

[^0]is expected annual earnings growth and $r$ is the required yield from shares. Yield may be divided into the "yield floor" (the yield on Treasury paper, which carries the least conceivable risk) and the risk premium on shares. Investors are not assumed to expect $d$ to change, and in fact this ratio is fixed at many companies. Accordingly, the smaller the difference between $r$ and $g$, the higher the $\mathrm{P} / \mathrm{E}$. Also, $\mathrm{P} / \mathrm{E}$ can become infinitely high if the difference between $r$ and $g$ is negligible; $r$ needs to be higher than $g$ for the equation to be valid. The sensitivity of P/E to changes in required yield increases in inverse proportion to this difference. Both required yield and expectations of company growth are themselves dependent on numerous factors in the capital market and the economy in general, as well as institutional factors. Changes in these factors, many of which are gradual in character, can explain a difference in average $\mathrm{P} / \mathrm{E}$ between periods and also between countries. Different accounting practices also reduce the comparability of $\mathrm{P} / \mathrm{E}$ by period or country.

## Risk premium on shares

If the risk premium on shares and investors' expectations about earnings growth were known, the Gordon equation could determine whether the price of a share were too high. Neither of these factors is measurable, however, and they are difficult to evaluate. Attempts are often made, however, partly because of the firm theoretical footing of the Gordon equation. Various statistical methods have thus been used to evaluate both risk premium and investor expectations. On this basis, the risk premium is generally considered to be close to $6 \%$. Long-term profit growth may be estimated from the expected development of capital employed in operations and the return on it. Risk premium on shares depends on both the business operating environment and prevailing notions of risk at any given place and time. Among the factors thought to influence a market's risk deterrent level are investor age distribution, the capital market's supply of instruments for spreading investors' risks, the weighting of institutional investors and the prior development of share prices (with greater risk deterrent following a price crash and vice versa).

[^1]
[^0]:    1. E.g. Robert Shiller (2000), Irrational Exuberance, p. 11..
[^1]:    Sources:
    IMF World Economic Outlook, "Asset prices and the business cycle", May 2000.
    Brealey, R. and A. Vila (1998), "Equity Prices and Financial Stability,",Financial Stability Review, vol. 5, The Bank of England.
    Robert Shiller (2000), Irrational Exuberance, Princeton University Press.

