

Cost of Capital

The most likely tasks in this area fall into the following groups:

- ☞ Calculate the cost of equity
- ☞ Calculate the cost of debt
- ☞ Calculate the weighted average cost of capital
- ☞ Apply appropriate methods to given scenarios
- ☞ Discuss when the WACC should be used and calculate alternatives

Calculate the Cost of Equity...

The cost of capital has been mentioned before, as the rate used to discount cash flows in investment appraisal. It is exactly what the name suggests – the cost to the business of the capital it needs to raise and use, and hence it is the minimum return the company can accept from its investments.

The cost of capital may be seen as the minimum return demanded by investors. In this sense it is an opportunity cost, as it represents the loss they will make through not investing elsewhere. It comprises three elements:

Risk free rate	<i>what would be demanded from an investment completely free of risk usually taken as the yield on government securities</i>
+ Premium for business risk	<i>uncertainty about business prospects, the type of business/project, etc.</i>
+ Premium for financial risk	<i>due to high gearing, covered in previous section</i>

The cost of equity may be calculated in two ways – the dividend valuation model, and the capital asset pricing model.

The Dividend Valuation Model

The basis of this model is that shareholders (and hence the market) value shares based on what they expect to get out of owning them – a stream of dividends. It states that the value of a share should be the present value of all future dividends, discounted at the cost of equity (the shareholders' required return).

If dividends are assumed to grow at a constant rate in perpetuity, the model gives the following formula (provided in the exam):

$$P_0 = \frac{d_0(1 + g)}{(k_e - g)}$$

where P_0 is the current ex-div share price, d_0 is the current dividend, g is the expected annual dividend growth rate and k_e is the cost of equity.

Example

An ordinary share has a current market value of \$1.50, and a dividend of \$0.15 has just been paid. Dividends are expected to grow at 3% per year.

Calculate the cost of equity capital.

Solution

The formula above is expressed in a form to calculate share price given the other variables, and needs to be rearranged if we want to calculate the cost of equity. This is simple enough if you remember that you can do anything to an equation, so long as you do the same to both sides.

It's the k_e that we want to isolate. At the moment it is on the bottom of a fraction, and is also bracketed with g . Treat the bracket as one term, and multiply both sides by that term - on the right hand side the bracket cancels and disappears:

$$P_0(k_e - g) = d_0(1 + g)$$

The term involving k_e is multiplied by P_0 , so let's divide by P_0 to get rid of it:

$$k_e - g = \frac{d_0(1 + g)}{P_0}$$

Now simply add g to both sides:

$$k_e = \frac{d_0(1 + g)}{P_0} + g$$

So, the cost of equity is calculated as

$$(0.15 \times 1.03 / 1.50) + 0.03 = 0.133 = 13.3\%$$

The growth rate was given in the previous example, but might need to be estimated in one of two ways.

First, it can be taken as average historical growth.

Example

Dividends in recent years have been as follows:

20X4	\$0.240 per share
20X5	\$0.250 per share
20X6	\$0.258 per share
20X7	\$0.264 per share
20X8	\$0.270 per share

Calculate the average growth rate per year.

Solution

First, calculate the growth rate over the whole period:

$$0.270/0.240 = 1.125$$

So dividends have grown by 12.5% over four years. Yes, *four* years rather than five – since 20X4 there have been *four* increases.

Realise how the annual growth rate, g , works – to get from one year's dividend to the next, we multiply by $(1 + g)$. To move four years at once, we multiply by $(1 + g)$ 4 times. In other words:

$$(1 + g)^4 = 1.125$$

$$(1 + g) = \sqrt[4]{1.125} = 1.030$$

So the annual growth rate, g , is 3.0%.

The second way to estimate g uses **Gordon's growth approximation**, the formula for which is provided in the exam:

$$g = br$$

where b is the proportion of profits retained and r is the rate of return on new investments.

Example

A company always retains 40% of its earnings to invest in new projects, from which it expects to earn a return of 12%.

Calculate the annual growth rate in dividends.

Solution

$$g = br = 0.40 \times 0.12 = 0.048 = 4.8\%$$

Whilst the dividend valuation model is fairly straightforward to use, it does have its weaknesses. It does not explicitly incorporate risk (although risk is presumably incorporated into the market price of the share), and the assumption that g remains constant is probably unrealistic. No allowance is made for tax, and share issue costs are ignored.