Chapter 21

CAPM AND MM COMBINED

1. Introduction

In the two previous chapters we have discussed the effect of gearing on a company and then the effect of different levels of business risk.

Most companies will have some gearing and therefore the shareholders required return will be affected by both factors.

Similarly, if the financial manager is considering an investment in a new project, then the required return will be affected both by the business risk of the project and by the way in which the project is financed.

In this chapter we will put the two parts together and decide how a project should be appraised.

2. The effect of gearing on the β

In the previous chapter we ignored gearing completely and so the only risk was the business risk.

However, any gearing in a company makes a share in that company more risky.

Published β's are for shares and therefore measure not just the business risk of the company but, in addition, the effect of any gearing in the company – we call this the share β, or the equity β, or the geared β.

There is a formula, which is given to you in the examination, which allows us to remove the effect of the gearing and calculate what the β would be if there was no gearing – we call this β the asset β, or the earnings β, or the ungeared β.

The formula is as follows:

$$\beta_a = \left[\frac{V_e}{(V_e + V_d(1-T))}\beta_e\right] + \left[\frac{V_d}{(V_e + V_d(1-T))}\beta_d\right]$$

where:

β_a is the asset or ungeared β

β_e is the equity or geared β

β_d is the β of debt in the geared company

V_e is the market value of equity in the geared company

V_d is the market value of debt in the geared company

T is the rate of corporation tax

Note that unless told otherwise, we assume that debt is risk-free and therefore the second part of the formula disappears.

Example 1

P plc has a gearing ratio (debt to equity) of 0.4 and the β of its shares is 1.8.

Q plc has a gearing ratio of 0.2 and the β of its shares is 1.5.

The rate of corporation tax is 30%.

(a) **which is the more risky share?**
(b) **which company has the more risky business activity?**

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3. Estimating a discount rate for an investment

We are now in a position to estimate a discount rate to use for a project with any level of business risk, financed in any way.

3.1. The steps are as follows:

(a)   determine the β for the project. If necessary use the β of a similar company. If the β is a share β then it will need to be ungeared using the gearing of the similar company.

(b)   if the project is to be financed entirely from equity, then the required return (and hence the discount rate) will be determined directly from the β calculated in step (a).

Example 2

X plc is an oil company with a gearing ratio (debt to equity) of 0.4. Shares in X plc have a β of 1.48.

They are considering investing in a new operation to build ships, and have found a quoted shipbuilding company – Y plc. Y plc has a gearing ratio (debt to equity) of 0.2, and shares in Y plc have a β of 1.8.

The market return is 18% and the risk free rate is 8%.

Corporation tax is 25%

Calculate the project specific cost of equity

Note: this example does raise the problem as to what the discount rate should be if the project is to be financed partly by debt. However this is not in the syllabus for F9 and is covered in Paper P4.

Now read the following technical article available on the ACCA website:
"**Cost of capital, gearing and CAPM (part 1 and part 2)**"

When you finished this chapter you should attempt the online F9 MCQ Test