Managerial Economics (UWEW28)

Value Maximising Strategies - I

Maximising firm value (for shareholders) often given as strategic objective of managers

There are many ways of doing this (and factors to be considered)

We are going to consider just two: I - changing the *business risk* of the firm
II- changing the *capital structure* of the firm

INTRODUCTION,
THE COST OF CAPITAL,
BUSINESS RISK AND COST OF CAPITAL,
CONCLUSION

Outcome: At the end of this session you should be able to explain how (and why) a firm might enhance its value by modifying its business activities without changing the level of profitability.

INTRODUCTION

Firstly, we need to recall that the value of any asset (firm = collection of assets):

depends upon its ability to generate a future stream of earnings for a given level of risk.

Hence: $$PV = \frac{A}{K}\left(1 - \frac{1}{(1+K)^n}\right) + \frac{M}{(1+K)^n} \qquad (1)$$

Where: A = annual earnings
K = an appropriate rate of discount (incorporating a risk premium)
M = maturity or redemption value of the asset (if any).

Notice that if $n = \infty$ then (1) simplifies to A/K. (2)

Hence a perpetual bond paying £2.50 per year is worth approx 2.50/0.0375 = £66.66 today (if we discount by 3.75%).

For the purpose of our discussion we are going to suppose that (2) gives us the value of a firm. This is a simplification in the sense that *A* is a constant whereas firms' earnings are expected to grow. But this makes no difference except to the details of the valuation formula.

If we apply *A/K* to the valuation of the firm, then *A* is a firm's earnings (i.e. profits) and *K* is the firm's cost of capital.

THE COST OF CAPITAL

Qn 1: From where do we get the firm's cost of capital?

Ans: = rate of return required by shareholders + bondholders etc (who can sell and walk away if they don't get it).

Qn 1: *Why do we discount the earnings by the firm's cost of capital?*

Ans: Because the value of the firm is what shareholders + bondholders are prepared to pay for it, given the returns they can elsewhere from assets of similar risk.

Suppose that the firm is financed by a combination of shares (equity = *E*) and by bonds (debt = *D*). Then the firm's cost of capital is the weighted average of the two costs, where the weights are the proportions of debt and equity in the total capital structure.

If *Ke* = cost of equity and *Kd* = cost of debt, then:

$$\text{WACC} = Ko = Ke\left(\frac{E}{D+E}\right) + Kd(1-t)\left(\frac{D}{D+E}\right) \qquad (3)$$

'WACC' is the weighted average cost of capital
D and *E* are the values of debt and equity (at market prices)
t is the rate of corporate tax (interest paid on debt is tax deductible for firms)

Note that *Kd* usually less than *Ke.*

Q3: Why is the cost of debt less than the cost of equity?

Ans: (a) tax subsidy; (b) bondholders face less risk than shareholders because of prior claims.

In practice, *Kd* is set by the return on long-dated government bonds + a risk premium which follows from the risk category established by the international bond-rating agencies (Moodys, Standard & Poor's etc..)

Ke is more complicated. $Kei = Krf + \beta i(Km - Krf)$ (4)

Where *Kei* is the cost of equity capital for firm *i*.
Krf is the risk free rate of interest (e.g. 3-month TB rate)
βi is the 'beta coefficient' for firm *i*
Km is the return on the 'whole market portfolio' e.g. the whole London share market

(Let's drop the '*i*' for convenience. We know we are dealing with an individual firm).

The way to read (4) is that the return required by shareholders in this firm is equal to:
The going risk free rate (which obviously sets the floor)
+ a risk premium represented by $\beta(Km - Krf)$

The risk premium in turn is made up of $(Km - Krf)$ which is the 'market risk premium' i.e the premium required by shareholders to induce them to hold the' whole market portfolio'. The relevance of this is that the whole market portfolio is the ultimate in diversified portfolios. By maximising diversification shareholders have minimised the risk to which they are exposed. The remaining risk is 'involuntary' and has to be paid for and $(Km - Krf)$ is the rate that 'the market' has decided on.

β then determines the fraction of the MRP which should be applied to our firm's cost of equity capital. It is an index of the riskiness of our firm's shares against the whole market portfolio and is found simply by regressing the change in return on the share in year *t* against the change in return on the whole market portfolio in same period. (β is the slope coefficient).

Notice that if our share's return varies just like the whole market portfolio it has the same risk, $\beta = 1$, and the share has same return has whole market.

Qn 4: If our firm's shares have a $\beta < 1$ *what is that telling us about the firm's riskiness relative to whole market?*

Ans: If $\beta < 1$ *our share is less risky than whole market*

So β is an index of the risk of our share compared with whole market.

So the way to read the risk premium $\beta(Km - Krf)$ is that it amounts to a fraction (or multiple) of the whole market risk premium, where the fraction (or multiple) depends on β.

In practice, β coefficients are calculated and published by a number of commercial agencies.

What determines the size of β? (The riskiness of our shares v-a-v whole market obviously). But what influences this? Two sources of risk:

a) 'business risk' deriving from the nature of our business activities
b) 'financial risk' deriving from our financial structure.

(a) may seem obvious. But (b) is drawing our attention to the effect of 'gearing'.

Gearing (= $D/(D+E)$) the fraction of debt in the capital structure. Why does this affect the riskiness of our shares (and our β)?

<u>Exercise 1:</u> Take two firms who have identical earnings (of £8m) and business risk, but firm B has a gearing ratio such that it has to meet interest payments of £1m per year.

Calculate the <u>percentage change in net earnings</u> (i.e.after interest) from year 1 to 2 and 2 to 3 if gross earnings in year 2 are 50% higher than in year 1 and 12.5% lower in year 3 than in year 1.

	Year 1	*Year 2*	*Year 3*
Firm A (gross)	*8m*	*12m*	*7m*
(net)	*8m*	*12m (+50%)*	*7m (-12.5%)*
Firm B (gross)	*8m*	*12m*	*7m*
less interest	*-1m*	*-1m*	*-1m*
(net)	*7m*	*11m (+57%)*	*6m (-14%)*

So, the more debt in the capital structure, the more variance (risk) in earnings available fro shareholders.

BUSINESS RISK AND THE COST OF CAPITAL

But capital structure is for next week. This week we are concerned with how we might change *business risk* in order to reduce cost of capital and increase firm value.

For the rest of this week we shall <u>assume that we are dealing with an all equity firm.</u>

It's risk (represented by β) is therefore due entirely to its business activities.
So, if it wishes to increase its value by changing its business activities it could:
lower its $\beta \rightarrow$ lower its Ke (which is now = Ko) $\rightarrow$ raise its market value.

Suppose we regard a firm as a collection of activities with differing risk. Then,
β (for whole firm) = $\sum \beta j.Wj$ where βj is the β of the j-th activity and Wj is the weight of that activity in the firm (as measured by the amount of capital devoted to it).

<u>Exercise 2:</u> Wilton Wayfarers plc is an all-equity travel firm, specialising in aircraft leasing and package holidays. Approx 75% of its capital is invested in aircraft leasing where the β coefficient is estimated at 1.2 The holiday business has a β coefficient of 1.0. The risk free rate of interest is 6% and the MRP = 10%.

a) Find the overall β for Wilton Wayfarers and its cost of equity capital.

$\beta = 0.75(1.2) + 0.25(1.0) = 1.15$
$Ke = 0.06 + 1.15(0.1) = 0.175 = 17.5\%$

Suppose that WW now decides to scale back its aircraft leasing business (to 50% of the business) replacing it with upmarket safari holidays whose β is estimated at 0.8.

b) Find the new β coefficient and the new cost of capital.

$\beta = 0.5(1.2) + 0.25(0.8) + 0.25(1.) = 1.05$
$Ke = 0.06 + 1.05(0.1) = o.165 = 16.5\%$

CONCLUSION

By changing its capital structure, WW can change the level of business risk. If safari holidays can produce the same level of profits as aircraft leasing, then WW's earnings will be unchanged but its overall risk will be less. The rate of return required by its shareholders will be lower and its value higher. A more intuitive way of looking at this is to say that when shareholders buy shares, they are buying a stream of income which comes with a degree of risk attached. They will be prepared to pay more for a given stream of income with a low risk than they will for the same income stream with a higher risk.

A FOOTNOTE FOR ENTHUSIASTS:
We have talked about WW's divisions having different estimated β coefficients. This raises the Q of how these β coefficients can be found. There is a problem. Recall that a firm's β coefficient describes the variability (riskiness) of the returns on its *shares*. Published βs are always 'equity βs'. Thus, a manager at WW plc could probably find a company which specialises in safari holidays and look up its β coefficient from a commercial source but this published β is picking up *both* the level of business risk *and* the finance risk that comes from the firm's gearing while what we want is a β which represents solely the business risk of safari holidays. Fortunately, there is a formula which allows us to convert 'equity' (i.e. published) βs to what we might call 'project' βs.

$\beta_p = \beta_e \frac{E}{E + D(1-t)} + \beta_d \frac{D(1-t)}{E + D(1-t)}$ where E and D are the capital structure of the firm we are *borrowing from.* β_d is the β coefficient of the firm's debt. This is commonly

assumed = 0, though this may not be accurate but it simplifies the conversion formula to $\beta_p = \beta_e \frac{E}{E + D(1-t)}$.

Remember WW was an all-equity firm. But if it was geared, then its own shareholders would face greater risk, and this would result in a higher required return on equity than the one we calculated above. The β we calculated (= 1.05) would need to be 'geared up' to reflect this. To do this we simply invert the formula $\beta_e = \beta_p \frac{E + D(1-t)}{E}$ where E and D this time reflect *WW's capital structure*.