Seminar Questions (1 – Firm Value and Business Risk)

(a) Distinguish between 'business risk' and 'financial risk'

Business risk – variability of profit before interest
(Largely result of underlying business activity)

Financial risk – variability of prof it after interest
(Resulting from the use of debt in the capital structure)

(b) 3. Company X is ungeared. Company Y is geared and its debt is such that it has to make interest payments of £42,000 per year. Operating profits for both companies in years 1, 2, 3 are:
Year 1: £156,000
Year 2: = Yr 1 - 25%
Year 3 = Yr 1 + 25%
Calculate and comment on the percentage change in *net* profit (i.e. after interest) for both companies between years 1 and 3.

	Yr1	*Yr2*	*Yr3*
CoX (gross)	*156*	*117*	*195*
(net)	*156*	*117 (-25%)*	*195 (+25%)*
CoY (gross)	*156*	*117*	*195*
(interest)	*-42*	*-42*	*-42*
(net)	*114*	*75 (-34%)*	*153 (+34%)*

(c) The risk free rate of interest is 8% while the whole market risk premium is 7%. Chartwell plc consists of three divisions as shown below, together with their relative contribution (by value) to the firm as a whole and their betas.

		ß
Food	0.25	0.47
Leisure	0.3	0.91
Property	0.45	2.00

(i) Find the beta coefficient for the firm as a whole and the return required by shareholders.

beta = 0.25(0.47) + 0.3(0.91) + 0.45(2) = 0.118 + 0.273 + 0.9 = 1.29

Ke = 0.08 + 1.29(0.07) = 0.1703 = 17.3%

(ii) The firm is considering reducing its property interests to 0.25 and diversifying into office products (which will form 20% of the firm). Its best estimate of the riskiness of office products is ß = 1.2. Find the ß-coefficient for Chartwell as a whole and the new required rate of return, if it goes ahead.
beta = 0.25(0.47) + 0.3(0.91) + 0.25(2) + 0.2(1.2) = 0.118 + 0.273 + 0.5 + 0.24 = 1.13

Ke = 0.08 + 1.13(0.07) = 0.159 = 15.9%

Seminar Questions (2 – Firm Value and Capital Structure)

(a) Outline the Miller-Modigliani capital irrelevance propositions I and II

The WACC is independent of the D/E ratio and equal to the cost of capital that the firm would have with no gearing in its capital structure. (i.e = Ke of an all-equity firm in same business risk class).

The cost of equity capital increases as a linear function of the gearing ratio.

(b) on what do these propositions depend?

Broadly, the assumptions of a perfect capital market:
Info and transaction costs = 0
Unlimited funds available at current rate of interest
No taxes

(c) Tick and Tock have identical business risk and gross earnings of £700K and £500K respectively. Both distribute all profits after interest.
Tick is an all-equity coy with a current market value of £3.9m. The current value of Tock's equity is £2.56m. It also has irredeemable debentures which have a current market value of £0.64m.
Individual investors and firms can borrow and lend at 5%. Ignore taxation.

(i) Explaining carefully your reasoning, discuss whether there is any scope for an investor currently holding shares in Tick or Tock to change his/her portfolio in a way that will achieve better returns without altering risk.

Step 1

Find Ko for each coy. *Ko (Tick) = Ke = 700K/3.9m = 17.9%*

Ko (Tock) = Ke(E/D+E) + Kd(D/D+E) *Kd = 5%*
Ke = (500K – interest) / 2.56m = (500K – 0.05(0.64m))/2.56m = 468K/2.56m = 18.28%

Ko = 0.183 x 2.56/(2.56 + 0.64) + 0.05 x 0.64/(2.56 + 0.64) = 0.1464 + 0.01 = 0.1564 = 15.64%

Step 2

Since Ko (Tick) is higher, sell shares in Tock and shift to Tick.
Suppose we sell £10K of shares in Tock.

We give up £10K x 18.28% = £1,828

Invest £10K in shares of Tick. We now earn £10K x 17.9% = £1,790 (worse off at this point).

Step 3

Create personal gearing to make same risk as investment in Tock.
Gearing of Tock = 0.64/3.2 = 20%.
Borrow £2.5K and invest in Tick. (NB we have now invested £12.5K of which £2.5K is borrowed, = 20%)
This yields a further £2.5K x 17.9% = £447.5.
But we must deduct £2.5K x 5% interest = -£125.

So net income after gearing = £1,790 + 447.5 – 125 = £2,112.5, a gain of £284.5

(ii) Explain what will happen to the costs of capital of the two coys if a large no. of investors alter their portfolios as in (i)?

Value of Tock equity falls; value of Tick equity rises.
This increases Tock's cost of equity (and its WACC) and lowers Tick's cost of equity (and its WACC)
Where does process stop? When no more arbitrage profits.
i.e. when equity prices have adjusted enough to make WACCs equal).