Practice Questions – Capital Structure

Question 01

Compute the company's financial gearing ratio from the following statement of financial position.

	Rs. Mn	Rs. Mn	Rs. Mn
Non-current assets			12,400
Current assets		1,000	
Payables: amounts falling due within one year			
Loans	120		
Bank overdraft	260		
Trade payables	430		
Bills of exchange	70		
		880	
Net current assets			120
Total assets less current liabilities			12,520
Payables: amounts falling due after more than one year			
Bonds		4,700	
Bank loans		500	
			(5,200)
Provisions for liabilities and charges: deferred taxation			(300)
Deferred income			(250)
Total net assets			6,770
Capital and reserves			
			Rs. '000
Called up share capital			
Ordinary shares			1,500
Preferred shares			500
			2,000
Share premium account			760
Revaluation reserve			1,200
Accumulated profits			2,810
Total share capital and reserves			6,770

Question 02

You need to be able to demonstrate the **impact of changing capital structures on investor ratios**. The following example illustrates how such a question could be set out.

A summarized statement of financial position of FR Co is as follows.

	Rs. Mn
Assets less current liabilities	150
Debt capital	(70)
	80
Share capital (20 million shares)	20
Reserves	60
	80

The company's profits in the year just ended are as follows.

	Rs. Mn
Profit from operations	21.0
Interest	6.0
Profit before tax	15.0
Taxation at 30%	4.5
Profit after tax (earnings)	10.5
Dividends	6.5
Retained profits	4.0

The company is now considering an investment of Rs. 25 million. This will add Rs. 5 million each year to profits before interest and tax.

(a) There are two ways of financing this investment. One would be to borrow Rs. 25 million at a cost of 8% per annum in interest. The other would be to raise the money by issuing 5 million additional shares at a price of Rs. 5 each.

(b) Whichever financing method is used, the company will increase dividends per share next year from 32.5c to 35c.

(c) The company does not intend to allow its gearing level, measured as debt finance as a proportion of equity capital plus debt finance, to exceed 55% as at the end of any financial year. In addition, the company will not accept any dilution in earnings per share.

Assume that the rate of taxation will remain at 30% and that debt interest costs will be Rs. 6 million plus the interest cost of any new debt capital.

Required

(a) **Prepare** a profit forecast for next year, assuming that the new project is undertaken and is financed (i) by debt capital or (ii) by a rights issue.

(b) **Calculate** the earnings per share next year, with each financing method.

(c) **Calculate** the effect on gearing as at the end of next year, with each financing method.

(d) **Explain** whether either or both methods of funding would be acceptable.

Solution

Current earnings per share are Rs. 10.5 million/20 million shares = 52.5 cents.

If the project is financed by Rs. 25 million of debt at 8%, interest charges will rise by Rs. 2 million. If the project is financed by an issue of shares, there will be 25 million shares in issue.

	Finance with debt	*Finance with rights issue*
	Rs. Mn	Rs. Mn
Profit before interest and tax (+ 5.0)	26.00	26.00
Interest	8.00	6.00
	18.00	20.00
Taxation (30%)	5.40	6.00
Profit after tax	12.60	14.00
Dividends (35c per share)	7.00	8.75
Retained profits	5.60	5.25
Earnings (profits after tax)	Rs. 12.6m	Rs. 14.0m
Number of shares	20 million	25 million
Earnings per share	63c	56c

The projected statement of financial position as at the end of the year will be:

	Finance with debt	*Finance with rights issue*
	Rs. Mn	Rs. Mn
Assets less current liabilities	180.6	180.25
(150 + new investment of 25 + retained profits)		
Debt capital	(95.0)	(70.00)
	85.6	110.25
Share capital	20.0	25.00
Reserves	65.6	* 85.25
	85.6	110.25

*The rights issue raises Rs. 25 million, of which Rs. 5 million is represented in the statement of financial position by share capital and the remaining Rs. 20 million by share premium. The reserves are therefore the current amount (Rs. 60 million) plus the share premium of Rs. 20 million plus accumulated profits of Rs. 5.25 million.

	Finance with debt	*Finance with rights issue*
Debt capital	95.0	70.0
Debt capital plus equity finance	(95.0 + 85.6)	(70.0 + 110.25)
Gearing	53%	39%

Either financing method would be acceptable, since the company's requirements for no dilution in EPS would be met with an issue of shares as well as by borrowing, and the company's requirement for the gearing level to remain below 55% is (just) met even if the company were to borrow the money.

Question 03 - JUNE 2014: CA PROFESSIONAL (STRATEGIC LEVEL II) EXAMINATION

Siam Products PLC ("SP") is a company listed on the stock exchange. The company has been in the food processing business for more than a decade and it hardly uses outside debt, and is considered an all-equity firm.
SP is currently planning to diversify its investments into two other business sectors viz. Beer and Diary Products. Average betas of the two sectors are 1.38 and 0.56 respectively. The finance manager of the company has found that the investments in relation to the two identified sectors, Beer and Diary Products, will generate an Internal Rate of Return (IRR) of 16.25% and 11.61% respectively. However, the general manager of the company suggests that the company should go ahead only with the investment in the Beer sector, as it generates a higher IRR than the current cost of capital of the company, and not to invest in the Diary Product sector as its IRR falls below the current cost of capital of the company.

- The beta () factor estimated by the finance manager for SP is equal to 0.69.

- The average risk premium in the market is 8.5%

- The current one-year Treasury bill rate is 6.3%

Required:

(i) Determine the current cost of capital of SP in terms of the Capital Asset Pricing Model (CAPM) and estimate the required rates of return for the two sectors and the market portfolio. (5 marks)

(ii) Draw the security market line (SML) and show the relationship between equilibrium return and the beta factor in relation to the market, the company and the two sectors.

Hint: SML should start at the risk free rate and run through the market portfolio. (4 marks)

(iii) Evaluate the general manager's suggestion with regard to the investments in the two sectors using the figure drawn in (ii) above. To support your answer, locate the IRRs related to the two investments in the figure. (3 marks)

(iv) State the additional factors the company should consider in determining the industry attractiveness of the two sectors. (3 marks)

Question 04

A company is considering a business in which the expected weighted average cost of capital is 10% keeping in view the associated business risk. It has option to incorporate in Country A which has no taxes or in Country B which as 20% corporate taxes.

If the company's cost of debt is 6% in both countries, find out its cost of equity in both countries at the following debt-to-equity ratio levels: (a) zero, (b) 1, and (c) 2.

Country A

Cost of equity in a geared company = Cost of equity in an ungeared company + (Cost of equity in an ungeared company – cost of debt) x debt/equity ~~x (1-t)~~

Country A has no taxes, so we can use the cost of equity function as in Proposition 2 of the Theory

k_e @ D/E of 0 = 10% + (10% − 6%) × 0 = 10%... (100% x 10%) + ~~(d%xKd)~~ = 10%

k_e @ D/E of 1 = 10% + (10% − 6%) × 1 = 14%... (50% x 14%) + (50%x6%) = 10%

k_e @ D/E of 2 = 10% + (10% − 6%) × 2 = 18%... (33% x 18%) + (67%x6%) = 10%

Country A is a tax-free country (MM theory without tax)

We can demonstrate that the weighted average cost of capital at all level of debt-to-equity ratio is the same i.e. 10%. Let's see what happens at D/E of 1 or D/V of 50%:

WACC = 50% × 6% + 50% × 14% = 10%

Country B

Cost of equity in a geared company = Cost of equity in a ungeared company + (Cost of equity in a ungeared company – cost of debt) x debt/equity x (1-t)

Current entity is equity finance and ke is 10% therefore, WACC 10%

Have debt into capital under three scenario such as *0, 1 ,2* at 6% @ kd

Tax rate 20%

Existence of taxes creates a preference for debt resulting in a lower increase in equity with addition of debt as demonstrated below:

k_e @ D/E of 0 = 10% + (10% − 6%) × (1 − 20%) × 0 = 10%

k_e @ D/E of 1 = 10% + (10% − 6%) × (1 − 20%) × 0 = 13.2%

k_e @ D/E of 2 = 10% + (10% − 6%) × (1 − 20%) × 2 = 16.2%

The consequence of this less pronounced increase in cost of equity is that the weighted average cost of capital decrease with increase in debt-to-equity ratio. Theoretically, the value is maximized for an all-debt company. However, the existence of some other factors such as probability of bankruptcy, etc. causes the cost of debt to increase such that the value of a company is maximized at some intermediate point (i.e. between an all-debt and an all-equity capital structure).

Question 05

Question 1

KTC Ltd is currently an all equity company and has an unlevered value of $100million. The firm's current cost of capital is 25%. Due to insufficient internal funding for KTC's upcoming projects the firm's financial manager has decided to raise external funds of $20million through debt borrowings at 10% interest rate. Its corporate tax rate is 30%. Assume that the firm operates under the perfect capital market with corporate taxes as argued by Modigliani and Miller. Determine KTC's weighted average cost of capital if the firm proceeds with raising external funds.

Question 2

S&G Inc. is considering converting its all-equity capital structure to one that is of 20% debt. Currently, there are 20,000 shares outstanding and the price per share is $13.95.Earnings before interest and taxes (EBIT) are expected to remain at $120,200 per year forever. The cost of debt is 8%, and the tax rate is 35%.If the firm converts its all-equity capital structure to 20% debt, what is the levered firm value and WACC of S&G?

Question 3

Smartech Company is a levered firm with a current total value of $500 million comprising of $400 million equity and the remaining from debt capital. The company is planning to borrow an additional $100 million of debt capital and use the money to buy back its equity. The current cost of equity of Smartech before the share buyback is 11% and their pre-tax cost of debt is 7%. The corporate tax rate is 30%. Calculate the weighted average cost of capital of the firm after the share buyback.

Question 4

Comfort Textiles is currently a levered firm with $300,000 debt and firm value of $1,000,000. The firm incurs pre-tax cost of debt of 7% and pays tax rate of 30%. If the firm were all-equity financed, the firm's shareholders would require a rate of return of 12%. Assume that the Comfort Textiles maintains perpetual EBIT, calculate the firm's

(a) Unlevered firm value.
(b) Current WACC.
(c) Net income.

Question 5

Kiki is a levered firm that is made up of 40% debt and 60% equity financing. The firm's current market value is $50million; cost of equity is 15% while cost of debt before tax is 8%. Kiki is considering reducing debt borrowing to 30% debt and 70% equity. Tax rate is 30%. Calculate Kiki's firm value and WACC if the firm reduces debt financing and increases equity financing.

Question 1

$$V_L = V_U + tD$$
$$= \$100\text{million} + (0.30 \times \$20\text{million})$$
$$= \$106\text{million}$$

$$V_L = D + E$$
$$\$106{,}000{,}000 = \$20{,}000{,}000 + E$$
$$E = \$86{,}000{,}000$$

$$k_L = k_U + \frac{D}{E}(k_U - k_D)(1 - t)$$
$$k_L = 25\% + \frac{\$20{,}000{,}000}{\$86{,}000{,}000}(25\% - 10\%)(1 - 0.3) = 27.44\%$$

$$\text{WACC} = \frac{\$86{,}000{,}000}{\$106{,}000{,}000}(27.44\%) + \frac{\$20{,}000{,}000}{\$106{,}000{,}000}(10\%)(1 - 0.3) = 23.58\%$$

Question 2

V_U = \$13.95 x 20,000 shares
= \$279,000

$V_L = V_U + TD$
V_L = \$279,000 + 0.35(0.2 x V_L)
V_L = \$300,000

$$V_U = \frac{EBIT(1-T)}{k_U}$$

\$279,000 = \$120,200 (1-0.35)/k_U
k_U =28%

Cost of equity and WACC are the same for an unlevered firm.

$$k_L = k_U + \frac{D}{E}(k_U - k_D)(1-T)$$

$$k_L = 28\% + \frac{20}{80}(28\% - 8\%)(1-0.35)$$
$$= 31.25\%$$

WACC = 0.8(31.25%) + 0.2(8%) (1-0.35)
= 26.04%

Question 3

Before buyback:
$V_L = V_U + TD$
\$500m = V_U + 0.3(\$100m)
V_U = \$470m

After buyback:

$V_L = \$370m + 0.3(\$200m)$
$= \$530m$

Before buyback:

$$k_L = k_U + \frac{D}{E}(k_U - k_D)(1 - T)$$

$$11\% = k_U + \frac{\$100m}{\$400m}(k_U - 7\%)(1 - 0.3)$$

$$k_U = 10.40\%$$

After buyback:

$$k_L = 10.4\% + \frac{\$200m}{\$330m}(10.4\% - 7\%)(1 - 0.3)$$

$$= 11.84\%$$

WACC $= (\$330/\$530)(11.84\%) + (\$200m/\$530m)(7\%)(1\text{-}0.3)$
$= 9.22\%$

Question 4

(a) $V_U = \$1{,}000{,}000 - (0.30 \times \$300{,}000)$
$= \$910{,}000$

(b) $$k_L = k_U + \frac{D}{E}(k_U - k_D)(1 - t)$$

$$k_L = 12\% + \frac{\$300{,}000}{\$7{,}000{,}000}(12\% - 7\%)(1 - 0.3) = 13.5\%$$

$$WACC_L = \frac{\$700{,}000}{\$1{,}000{,}000}(13.5\%) + \frac{\$300{,}000}{\$1{,}000{,}000}(7\%)(1 - 0.3) = 10.92\%$$

(c) $$V_U = \frac{EBIT(1 - T)}{k_U}$$

$\$910{,}000 = EBIT(1\text{-}0.3)/0.12$
$EBIT = \$156{,}000$

Net Income = EBIT – Interest – Tax Payment
= (\$156,000 - \$21,000) (1-0.3)
= \$94,500

Question 5

$$V_U = \$50m - (0.30 \times \$20m)$$
$$= \$44m$$

$$V_L = V_U + TD$$
$$V_L = \$44m + 0.3(0.3 \times V_L)$$
$$V_L = \$48{,}351{,}648.35$$

$$k_L = k_U + \frac{D}{E}(k_U - k_D)(1-T)$$

$$15\% = k_U + \frac{0.4}{0.6}(k_U - 8\%)(1-0.3)$$

$$k_U = 12.77\%$$

$$k_L = 12.77\% + \frac{0.3}{0.7}(12.77\% - 8\%)(1-0.3)$$
$$= 14.20\%$$

$$WACC = 0.7(14.2\%) + 0.3(8\%)(1-0.3)$$
$$= 11.62\%$$

Question 06 - APV

A company is considering a project that would cost Rs. 100 million to be financed 50% by equity (cost 21.6%) and 50% by debt (pre-tax cost 12%). The financing method would maintain the company's WACC unchanged. The cash flows from the project would be Rs. 36 million a year in perpetuity, before interest charges. Tax is at 30%.

Required

Assess the project using firstly the NPV method and secondly the APV method.

Suppose in the above example the cash flows only lasted for five years, and tax was payable one year in arrears.

Required

Calculate the present value of the tax shield.

Question 07

A project costing Rs. 100m is to be financed by Rs. 60m of irredeemable 12% bonds and Rs. 40m of new equity. The project will yield an after-tax annual cash flow of Rs. 21m in perpetuity. If it were all equity financed, an appropriate cost of capital would be 15%. The tax rate is 30%.

Required

Calculate the project's APV.

Question 08 APV with issue costs

NCW Co is about to start a project with an initial investment of Rs. 20 million, which will generate cash flow over four years. The project will be financed with a Rs. 10 million 10-year bank loan and a rights issue. Issue costs are 5% of the amount raised.

Required

Calculate the issue costs that will be used in the APV calculation.

Assume in the example above that issue costs are allowable for tax purposes, the tax is assumed to be 30% payable one year in arrears and the risk-free rate of return is assumed to be 8%.

Required

Calculate the tax effect of the issuing costs to be included in the APV calculation.

Question 09 APV with spare debt capacity

Continuing with the NCW Co example, suppose that the project increased the borrowing capacity of the company by Rs. 6 million, at the risk-free rate of return of 8%.

Required

Calculate the effect on the APV calculation.

Question 10

GBL Co is about to start a project requiring Rs. 6 million of initial investment. The company normally borrows at 12%, but a government loan will be available to finance all of the project at 10%. The risk-free rate of interest is 6%. Tax is payable at 30% one year in arrears. The project is scheduled to last for four years.

Required

Calculate the effect on the APV calculation if GBL Co finances the project by means of the government loan.