

Chapter wise Test (2003)
Capital Structure

Instructions

- All questions are compulsory.
- Test Duration will be 1 Hour, starting from 11:00 AM to 12:00 Noon
- 5 minutes reading time will be provided before 11, i.e. question paper will be shared by 10:55 AM.
- Share your scanned answer sheets by 12:10 on below link
<https://forms.gle/wLRZWiTvMELNpCeC6>

1. [7 Marks] The following particulars relating to Nandu Ltd for the year ended 31 March 2023 is given

Output - 1,00,000 units at normal capacity	
Selling price per unit	Rs. 40
Variable cost per unit	Rs. 20
Fixed Cost	Rs. 10,00,000

The capital structure of the company as on 31 march 2023 is as follows

Particulars	Amount
Equity Share Capital (100,000 shares at Rs. 10 each)	10,00,000
Reserves and Surplus	5,00,000
7% Debentures	10,00,000
Current Liabilities	5,00,000
Total	30,00,000

Nandu Ltd has decided to undertake an expansion project to use the market potential, that will involve 10 lakhs.

The company expects an increase in output by 50% Fixed cost will be increased by ₹ 5,00,000 and variable cost per unit will be decreased by 10%. The additional output can be sold at the existing selling price without any adverse impact on the market.

The following alternative schemes for financing the proposed expansion programme are planned:

1. Entirely by equity shares of 10 each at par
2. 5 lakh by issue of equity shares of 10 each and the balance by issue of 6% debentures of 100 each at par
3. Entirely by 6% debentures of 100 each at par

Find out which of the above-mentioned alternatives would you recommend for Nandu Ltd. with reference to the risk and return involved, assuming a corporate tax of 40%

Solution

Computation of EPS			
	Plan 1	Plan 2	Plan 3
Sales [150000 x 40]	60L	60L	60L
- VC [20 x 90% x 150000]	27L	27L	27L
Conr	33L	33L	33L
- R	-15L	-15L	-15L
EBIT	18L	18L	18L
- Int			
Existing	.7L	.7L	.7L
new	[10L x 7%]	.3L	.6L
		[5L x 6%]	[10L x 6%]
EBT	16.3L	17L	16.9L
- Tax 40%	6.52L	6.8L	6.688L
EAT (A)	9.78L	10.2L	10.032L
No. of shares			
existing	1L	1L	1L
new	1L	.5L	0
(B)	[10L/10]	[5L/10]	-
	2L	1.5L	1L
EPS	4.89	6.8	10.032

2. [6 Marks] A company needs Rs. 42,50,000 for the construction of a new plant. The following three plans are feasible:

- I The company may issue 4,25,000 equity shares at Rs. 10 per share.
- II The company may issue 2,12,500 equity shares at Rs. 10 per share and 21,250 debentures of Rs. 100 denominations bearing an 8% rate of interest.

- III The company may issue 2,12,500 equity shares at Rs. 10 per share and 21,250 cumulative preference shares at Rs. 100 per share bearing an 8% rate of dividend.
- (i) The company's earnings before interest and taxes are Rs. 75,000, Rs. 1,50,000, Rs. 3,00,000, Rs. 4,50,000 and Rs. 7,50,000. DETERMINE earnings per share under each of three financial plans? Assume a corporate income tax rate of 40%.
- (ii) IDENTIFY which alternative would you recommend and why?
- (iii) DETERMINE the EBIT-EPS indifference points by formulae between Financing Plan I and Plan II and Plan I and Plan III.

Solution

- (i) Computation of EPS under three-financial plans.

Plan I: Equity Financing

	(₹)	(₹)	(₹)	(₹)	(₹)
EBIT	75,000	1,50,000	3,00,000	4,50,000	7,50,000
Interest	0	0	0	0	0
EBT	75,000	1,50,000	3,00,000	4,50,000	7,50,000
Less: Tax @ 40%	30,000	60,000	1,20,000	1,80,000	3,00,000
PAT	45,000	90,000	1,80,000	2,70,000	4,50,000
No. of equity shares	4,25,000	4,25,000	4,25,000	4,25,000	4,25,000
EPS	0.11	0.21	0.42	0.64	1.06

Plan II: Debt – Equity Mix

	(₹)	(₹)	(₹)	(₹)	(₹)
EBIT	75,000	1,50,000	3,00,000	4,50,000	7,50,000
Less: Interest	1,70,000	1,70,000	1,70,000	1,70,000	1,70,000
EBT	(95,000)	(20,000)	1,30,000	2,80,000	5,80,000
Less: Tax @ 40%	38,000*	8000*	52,000	1,12,000	2,32,000
PAT	(57,000)	(12,000)	78,000	1,68,000	3,48,000
No. of equity shares	2,12,500	2,12,500	2,12,500	2,12,500	2,12,500
EPS	(₹ 0.27)	(0.056)	0.37	0.79	1.64

* The Company can set off losses against the overall business profit or may carry forward it to next financial years.

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Plan III: Preference Shares – Equity Mix

	(₹)	(₹)	(₹)	(₹)	(₹)
EBIT	75,000	1,50,000	3,00,000	4,50,000	7,50,000
Less: Interest	0	0	0	0	0
EBT	75,000	1,50,000	3,00,000	4,50,000	7,50,000
Less: Tax @ 40%	30,000	60,000	1,20,000	1,80,000	3,00,000
PAT	45,000	90,000	1,80,000	2,70,000	4,50,000
Less: Pref. dividend	1,70,000*	1,70,000*	1,70,000	1,70,000	1,70,000
PAT after Pref. dividend.	(1,25,000)	(80,000)	10,000	1,00,000	2,80,000
No. of Equity shares	2,12,500	2,12,500	2,12,500	2,12,500	2,12,500
EPS	(0.59)	(0.38)	0.05	0.47	1.32

* In case of cumulative preference shares, the company must pay cumulative dividend to preference shareholders, when company earns sufficient profits.

(ii) From the above EPS computations tables under the three financial plans we can see that when EBIT is ₹ 4,50,000 or more, Plan II: Debt-Equity mix is preferable over the Plan I and Plan III, as rate of EPS is more under this plan. On the other hand, an EBIT of less than ₹4,50,000, Plan I: Equity Financing has higher EPS than Plan II and Plan III. Plan III Preference Share-Equity mix is not acceptable at any level of EBIT, as EPS under this plan is lower.

The choice of the financing plan will depend on the performance of the company and other macro-economic conditions. If the company is expected to have higher operating profit Plan II: Debt – Equity Mix is preferable. Moreover, debt financing gives more benefit due to availability of tax shield.

(iii) **EBIT – EPS Indifference point: Plan I and Plan II**

$$\frac{\text{EBIT}_1 \times (1-t)}{\text{No. of equity shares } (N_1)} = \frac{(\text{EBIT}_2 - \text{Interest}) \times (1-t)}{\text{No. of equity shares } (N_2)}$$

3. [5 Marks] Kee Ltd. and Lee Ltd. are identical in every respect except for capital structure. Kee Ltd. does not employ debt in its capital structure, whereas Lee Ltd. employs 12% debentures amounting to Rs. 20 lakhs. Assuming that:

- (i) All assumptions of MM model are met;
 - (ii) The income tax rate is 30%;
 - (iii) EBIT is Rs. 5,00,000 and
 - (iv) The equity capitalization rate of Kee Ltd. is 25%.
- CALCULATE the average value of both the Companies.

Solution

(a) Kee Ltd. (pure Equity) i.e. unlevered company:

$$\text{EAT} = \text{EBT} (1 - t)$$

$$= \text{EBIT} (1 - 0.3) = \text{Rs. } 5,00,000 \times 0.7 = \text{Rs. } 3,50,000$$

(Here, EBIT = EBT as there is no debt)

$$\begin{aligned} \text{Value of unlevered company Kee Ltd.} &= \frac{\text{EAT}}{\text{Equity capitalization rate}} \\ &= \frac{\text{Rs. } 3,50,000}{25\%} = \text{Rs. } 14,00,000 \end{aligned}$$

Lee Ltd. (Equity and Debt) i.e. levered company:

$$\begin{aligned} \text{Value of levered company} &= \text{Value of Equity} + \text{Value of Debt} \\ &= \text{Rs. } 14,00,000 + (\text{Rs. } 20,00,000 \times 0.3) \\ &= \text{Rs. } 20,00,000 \end{aligned}$$

4. [5 Marks] Rounak Ltd. is an all equity financed company with a market value of Rs. 25,00,000 and cost of equity (K_e) 21%. The company wants to buyback equity shares worth Rs. 5,00,000 by issuing and raising 15% perpetual debt of the same amount. Rate of tax may be taken as 30%. After the capital restructuring and applying MM Model (with taxes), you are required to COMPUTE:

(i) Market value of J Ltd.

(ii) Cost of Equity (K_e)

(iii) Weighted average cost of capital (using market weights) and comment on it.

Solution

Value of a company (V) = Value of equity (S) + Value of debt (D)

$$\text{` } 25,00,000 = \frac{\text{Net Income (NI)}}{K_e} + \text{` } 5,00,000$$

$$\text{Or, Net Income (NI)} = 0.21 (\text{` } 25,00,000 - \text{` } 5,00,000)$$

$$\text{Market Value of Equity} = \text{` } 25,00,000$$

$$K_e = 21\%$$

$$\frac{\text{Net income (NI) for equity holders}}{K_e} = \text{Market Value of Equity}$$

$$\frac{\text{Net income (NI) for equity holders}}{0.21} = \text{` } 25,00,000$$

$$\text{Net income for equity holders} = \text{` } 5,25,000$$

$$\text{EBIT} = 5,25,000 / 0.7 = \text{` } 7,50,000$$

	All Equity	Debt and Equity
EBIT	7,50,000	7,50,000
Interest to debt-holders	-	(75,000)
EBT	7,50,000	6,75,000
Taxes (30%)	(2,25,000)	(2,02,500)
Income available to equity shareholders	5,25,000	4,72,500
Income to debt holders plus income available to shareholders	5,25,000	5,47,500

Present value of tax-shield benefits = ₹ 5,00,000 × 0.30 = ₹ 1,50,000

(i) **Value of Restructured firm**

$$= ₹ 25,00,000 + ₹ 1,50,000 = ₹ 26,50,000$$

(ii) **Cost of Equity (K_e)**

$$\text{Total Value} = ₹ 26,50,000$$

$$\text{Less: Value of Debt} = ₹ 5,00,000$$

$$\text{Value of Equity} = ₹ 21,50,000$$

$$K_e = \frac{4,72,500}{21,50,000} = 0.219 = 21.98\%$$

(iii) **WACC (on market value weight)**

$$\text{Cost of Debt (after tax)} = 15\% (1 - 0.3) = 0.15 (0.70) = 0.105 = 10.5\%$$

Components of Costs	Amount (₹)	Cost of Capital (%)	Weight	WACC (%)
Equity	21,50,000	21.98	0.81	17.80
Debt	5,00,000	10.50	0.19	2.00
	26,50,000			19.80

Comment: At present the company is all equity financed. So, $K_e = K_o$ i.e. 21%. However, after restructuring, the K_o would be reduced to 19.80% and K_e would increase from 21% to 21.98%.

5. [7 Marks] The following data relates to two companies belonging to the same risk class:

Particulars	A Ltd.	B Ltd.
Expected Net Operating Income	Rs. 18,00,000	Rs. 18,00,000
12% Debt	Rs. 54,00,000	-
Equity Capitalization Rate	-	18

REQUIRED:

- (a) Determine the total market value, Equity capitalization rate and weighted average cost of capital for each company assuming no taxes as per M.M. Approach.
 (b) Determine the total market value, Equity capitalization rate and weighted average cost of capital for each company assuming 40% taxes as per M.M. Approach.

Solution

- (a) Assuming no tax as per MM Approach.

Calculation of Value of Firms 'A Ltd.' and 'B Ltd' according to MM Hypothesis

Market Value of 'B Ltd' [Unlevered(u)]

$$\text{Total Value of Unlevered Firm } (V_u) = [\text{NOI}/k_e] = 18,00,000/0.18 = ₹ 1,00,00,000$$

K_e of Unlevered Firm (given) = 0.18

K_o of Unlevered Firm (Same as above = k_e as there is no debt) = 0.18

Market Value of 'A Ltd' [Levered Firm (l)]

$$\begin{aligned} \text{Total Value of Levered Firm } (V_l) &= V_u + (\text{Debt} \times \text{Nil}) \\ &= ₹ 1,00,00,000 + (54,00,000 \times \text{nil}) \\ &= ₹ 1,00,00,000 \end{aligned}$$

Computation of Equity Capitalization Rate and Weighted Average Cost of Capital (WACC)

	Particulars	A Ltd.	B Ltd.
A.	Net Operating Income (NOI)	₹ 18,00,000	₹ 18,00,000
B.	Less: Interest on Debt (I)	₹ 6,48,000	-
C.	Earnings of Equity Shareholders (NI)	₹ 11,52,000	₹ 18,00,000
D.	Overall Capitalization Rate (k_o)	0.18	0.18
E.	Total Value of Firm ($V = \text{NOI}/k_o$)	₹ 1,00,00,000	₹ 1,00,00,000
F.	Less: Market Value of Debt	₹ 54,00,000	-
G.	Market Value of Equity (S)	₹ 46,00,000	₹ 1,00,00,000
H.	Equity Capitalization Rate [$k_e = \text{NI}/S$]	0.2504	0.18
I.	Weighted Average Cost of Capital [WACC (k_o)] $k_o = (k_e \times S/V) + (k_d \times D/V)$	0.18	0.18

*Computation of WACC A Ltd

Component of Capital	Amount	Weight	Cost of Capital	WACC
Equity	₹ 46,00,000	0.46	0.2504	0.1152
Debt	₹ 54,00,000	0.54	0.12*	0.0648
Total	₹ 1,00,00,000			0.18

* $K_d = 12\%$ (since there is no tax)

WACC = 18%

- (b) Assuming 40% taxes as per MM Approach

Calculation of Value of Firms 'A Ltd.' and 'B Ltd' according to MM Hypothesis

Market Value of 'B Ltd' [Unlevered(u)]

$$\begin{aligned} \text{Total Value of unlevered Firm (V}_u) &= [\text{NOI} (1 - t)/k_e] = 18,00,000 (1 - 0.40) / 0.18 \\ &= ₹60,00,000 \end{aligned}$$

K_e of unlevered Firm (given) = 0.18

K_o of unlevered Firm (Same as above = k_e as there is no debt) = 0.18

Market Value of 'A Ltd' [Levered Firm (I)]

$$\begin{aligned} \text{Total Value of Levered Firm (V}_L) &= V_u + (\text{Debt} \times \text{Tax}) \\ &= ₹ 60,00,000 + (₹ 54,00,000 \times 0.4) \\ &= ₹ 81,60,000 \end{aligned}$$

Computation of Weighted Average Cost of Capital (WACC) of 'B Ltd.'

= 18% (i.e. $K_e = K_o$)

Computation of Equity Capitalization Rate and Weighted Average Cost of Capital (WACC) of A Ltd

Particulars	A Ltd. (₹)
Net Operating Income (NOI)	18,00,000
Less: Interest on Debt (I)	6,48,000
Earnings Before Tax (EBT)	11,52,000
Less: Tax @ 40%	4,60,800
Earnings for equity shareholders (NI)	6,91,200
Total Value of Firm (V) as calculated above	81,60,000
Less: Market Value of Debt	54,00,000
Market Value of Equity (S)	27,60,000
Equity Capitalization Rate [$k_e = \text{NI}/S$]	0.2504
Weighted Average Cost of Capital (k_o)* $k_o = (k_e \times S/V) + (k_d \times D/V)$	13.23

*Computation of WACC A Ltd

Component of Capital	₹	Weight	Cost of Capital	WACC
Equity	27,60,000	0.338	0.2504	0.0846
Debt	54,00,000	0.662	0.072*	0.0477
Total	81,60,000			0.1323

* $K_d = 12\% (1 - 0.4) = 12\% \times 0.6 = 7.2\%$

WACC = 13.23%