CHAPTER – COST OF CAPITAL

MATH PART

1. As a financial analyst of Sameen Limited Company, you are required to determine the weighted average cost of capital of the company using: (a) Book value weight & (b) Market value weight. [Solved Problem: 4.1: Page – 200: NU Exam - 2007]

The company's present book value structure and other information are given below:

Sources of capital	Amount (Tk.)
14% Debentures (Tk.100 per debenture)	8,00,000
15% Preference Stock (Tk.100 Per share)	4,00,000
Equity shares (Tk.10 per share)	8,00,000
Total capital	**20,00,000**

All the securities are traded in the capital market. Recent prices are: Debentures Tk.110 per debenture; Preference shares Tk.120 per share; Equity share Tk.22 per share. Anticipated external financing opportunities are:

i. Tk. 100 per debenture redeemable **at par**, 10-year maturity, 4% flotation cost.

ii. Tk. 100 per Preference shares **redeemable at par**, **10-year maturity**, 5% flotation cost.

iii. Equity shares: **Tk. 2 flotation cost** per share.

In addition, the dividend expected on the equity share at the end of the year is Tk. 2 per share, the anticipated growth rate in dividend is 7% and the firm has the practice of paying all of its earnings in the form of dividend. The corporate tax rate 40 percent.

1. Weight = Amount of specific source / Total amount of capital

2. Cost of specific source = **Ke, Kd, Kp**

(800000/100)= 8000*110 = 8,80,000

(400000/100) = 4000*120 = 4,80,000

(800000/10)=80000*22 = 17,60,000

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WACC using Market Value

Source of capital 1	Amount 2	Weight 3	Cost of Specific Sources 4	WACC 5 = 3*4
14% Debentures (Tk. 100 per debenture)	8,80,000	0.2821	0.1576	0.04445
15% Preference Stock (Tk. 100 Per share)	4,80,000	0.1538	0.124	0.01907
Equity shares (Tk. 10 per share)	17,60,000	0.5641	0.1388	0.07829
Total	31,20,000	1.00		WACC=14.18%

02. Consider the following capital structure of company-

Source of capital	Amount
Common stock capital of Tk.100	10,00,000
Retained earnings	5,00,000
15% Preferred stock of Tk.100 par value	5,00,000

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16% Preferred stock of Tk.1000 par value	10,00,000
14% Debenture of Tk.3000 par value	10,00,000
13% Debenture of Tk. 2000 par value	10,00,000
Total	50,00,000

Additional Information: **I = 2000*13% =260**

i. The company paid dividend of Tk. 20 par share which is expected to grow at the rate 5%. Market price of the share is Tk. 200 and flotation cost is Tk. 5 par share.

ii. Corporate tax rate is 25% and personal income tax rate is 20%.

iii. The market price of 15% preferred stock is Tk.110 and flotation cost is Tk.2 par share.

iv. The duration of 16% preferred stock is 5 years. Market price of the share is Tk.1100 and flotation cost is 1% on market price. Redemption at par.

v. Market price of 14% debenture is Tk.2800 and flotation cost is 1% on par value.

vi. 13% debenture issued for 7 years. Its market price is Tk.2100 and flotation cost Tk. 15 par debenture. Redemption at par.

You are required to calculate WACC of the company.

Solve:

Do = Tk.20, g = 5%, Po = Tk200, f=Tk.5

(i). Cost of Common stock,

$$Ke = [20(1+0.05)/200 - 5] + 0.05 = 15.76\%$$

(ii). Cost of Retained Earnings

$$Kr = [20(1+0.05)/200 + 0.05] * (1 - 0.20) = 12.4\%$$

(iii). Cost of 15% Preferred stock,

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Kp = 15/(110 – 2) = 13.88%

(iv). Cost of 16% Preferred stock, D = 1000*16%=160, f=1100*1%=11, RV = 1000Tk

Kp = [160+(1000 – 1089)/5] / (1000+1089)/2 = 13.61%

(v). Cost of 14% Debenture, I = 3000*14% = 420, Po = 2800 F= 3000*1%= 30

Kd = [420(1-0.25)/(28,00 – 30)] = 11.37%

(vi). Cost of 13% Debenture,

Kd = [260(1-0.25)+(2000 – 2085)/7] / [(2000+2085)/2] = 8.95%

Calculation of WACC

Source of capital **1**	**Amount** **2**	**Weight** **3**	**Cost of Specific Sources** **4**	**WACC** **5 = 3*4**
Common stock capital of Tk.100	10,00,000	0.2	0.1576	
Retained earnings	5,00,000	0.1	0.124	
15% Preferred stock of Tk.100 par value	5,00,000	0.1	0.1388	
16% Preferred stock of Tk. 1000 par value	10,00,000	0.2	0.1361	
14% Debenture of Tk. 3000 par value	10,00,000	0.2	0.1137	
13% Debenture of Tk. 2000 par value	10,00,000	0.2	0.0895	
Total	50,00,000	1.00		WACC=

WACC using Market Value

Source of capital **1**	**Amount** **2**	**Weight** **3**	**Cost of Specific Sources** **4**	**WACC** **5 = 3*4**
Common stock capital of Tk.100	10,00,000	0.2	0.1576	
Retained earnings	5,00,000	0.1	0.124	

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15% Preferred stock of Tk.100 par value	5,00,000	0.1	0.1388	
16% Preferred stock of Tk. 1000 par value	10,00,000	0.2	0.1361	
14% Debenture of Tk. 3000 par value	10,00,000	0.2	0.1137	
13% Debenture of Tk. 2000 par value	10,00,000	0.2	0.0895	
Total	50,00,000	1.00		WACC=

03. The Max Company was recently formed to manufacture a new product. It has the following capital structure in market value terms:

Sources of capital	**Amount (Tk.)**
Debentures	60,00,000
Preference Stock	20,00,000
Common shares (3,20,000 shares)	80,00,000

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Total capital	**1,60,00,000**

The company has a marginal tax rate of 40%. A study of publicity held companies in this line of business suggests that the required return on equity is about 17%. The Manx company's debt currently yielding 13% and its preferred stock is yielding 12%. Compute the firm's present weighted Average Cost of Capital.

Ke =17%

After tax cost of debt capital, Kd = 0.13(1 - 0.4) = 7.8%

Kp = 12%

04. A public limited company has the following capital structure:

Common share (40,000 shares)	4,00,000
10% Preferred share	1,00,000
14% Debentures	3,00,000
Total	**8,00,000**

The share of the company sells for Tk.200. if is expected that the company will pay next year a dividend of Tk.20 per share which will grow at 7% forever. Assume a 30% tax rate.

i. Compute weighted Average Cost of Capital based on existing capital structure.

ii. Compute the new WACC if the company raises an additional Tk.2,00,000 debt by issuing 15% debenture. This would result in increasing the expected dividend to Tk.30 and leave the growth rate unchanged, but the price of share will fall to Tk.150 per share.

Solution: Ke = [20/(200 - 0)] + 0.07 = 17%

Kp = 10%

Kd = 0.14 (1 – 0.3) = 9.8%

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Sources	Amount	Weight	Cost of specific Sources	WACC
Common share (40,000 shares)	4,00,000	0.50	0.17	0.085
10% Preferred share	1,00,000	0.125	0.10	0.0125
14% Debentures	3,00,000	0.375	0.098	0.03675
Total	**8,00,000**	**1.00**		**0.13425** **Or 13.425%**

Ke = [30/(150 - 0)] + 0.07 = 20%

Kp = 10%

Kd = 0.15 (1 – 0.3) = 10.5%

Sources	Amount	Weight	Cost of specific Sources	WACC
Common share (40,000 shares)	4,00,000	0.4	0.20	0.08
10% Preferred share	1,00,000	0.1	0.10	0.01
14% Debentures	3,00,000	0.3	0.098	0.0294
15% Debentures	2,00,000	0.2	0.105	0.021
Total	**10,00,000**	**1.00**		**14.04%**