a) $WACC_1 = K_{e_1} \cdot W_{e_1} + K_{dat_1} \cdot W_{d_1}$

K_{dat_1} (Cost of debt)

Because $MV < Par \Rightarrow$ yield $> CR$ 1

@ 11%

$$10 * A_{5,11\%} + \frac{100}{(1+0.11)^5} = 96.30$$ 1

@ 12%

$$10 * A_{5,12\%} + \frac{100}{(1+0.12)^5} = 92.79$$ 1

$$K_{dbt,1} = 11\% + \frac{96.30 - 95}{96.30 - 92.79}(12 - 11) =$$

$$= 11.37\%$$ 2

$$K_{dat_1} = 11.37(1 - 0.3) = 7.96\%$$ 1

6 Marks

b) $K_e = R_f + \beta(R_m - R_f)$

$K_e = 3 + 1.4(8.4 - 3) = 10.56\%$

Now we need to calculate the weights.

$V_d = 150{,}000 * 95 = 14{,}250{,}000$ (this is the market value of debt)

$V_e = 15{,}000{,}000 * 3 = 45{,}000{,}000$ (this is the market value of equity)

$W_d = \frac{V_d}{V_d + V_e}$; $W_e = \frac{V_e}{V_d + V_e}$

$W_d = \frac{14{,}250{,}000}{14{,}250{,}000 + 45{,}000{,}000} = 0.24$

$W_e = \frac{45{,}000{,}000}{14{,}250{,}000 + 45{,}000{,}000} = 0.76$

$WACC = \underset{K_{DAT}}{7.96} \cdot \underset{W_d}{0.24} + \underset{K_e}{10.56} \cdot \underset{W_e}{0.76}$

b) $WACC_2 = Ke_2 \cdot We_2 + K_{dot_1} \cdot W_{d_{1,2}} + K_{dot_2} \cdot W_{d_2}$

K_{dot_2}

$CR = \frac{8\%}{4} = 2\%$ 1

Coupon Payment $100 \times 0.02 = ₹2$

# of periods 2 years $\times$ 4 (quarterly) $= 8$ 1

@ 3%

$$2 \cdot A_{8,3\%} + \frac{100}{(1+0.03)^8} = 92.98$$ 1

@ 4%

$$2 \cdot A_{8,4\%} + \frac{100}{(1+0.04)^8} = 86.53$$ 1

$$K_{dbt,2\,(quarterly)} = \frac{92.98 - 90}{92.98 - 86.53}(4-3) + 3\% =$$

$$= 3.46\%$$ 1

Annualised

$$K_{dbt_2} = (1 + 0.0346)^4 - 1 = 14.6\%$$ 1

$$K_{dot_2} = 14.6(1 - 0.30) = 10{,}21\%$$

6 Marks

OK, the assumption we are making here is that the cost of equity is going to stay the same. Therefore

$K_e = 10.56\%$

$K_{dAT_1} = 7.96\%$

$K_{dAT_2} = 10.21\%$

$V_{d_1} = 14,250,000$

$V_{d_2} = 200,000 * 90 = 18,000,000$

Number of shares repurchased

$\frac{18,000,000}{3} = 6,000,000$

Number of shares remaining:

$15,000,000 - 6,000,000 = 9000,000$

$V_e = 9,000,000 * \underline{\underline{3,20}} = 28,800,000$

$$W_{d_1} = \frac{V_{d_1}}{V_{d_1} + V_{d_2} + V_e} = 0.23$$

$$W_{d_2} = \frac{V_{d_2}}{V_{d_1} + V_{d_2} + V_e} = 0.3$$

$$W_e = \frac{V_e}{V_{d_1} + V_{d_2} + V_e} = 0.47$$

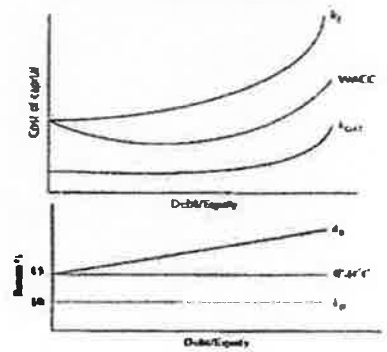
$$WACC = 0.47 \cdot 10.56 + 0.3 \cdot 10.21 + 0.23 \cdot 7.96 =$$

Madiglianni and Miller - weights are irrelevant and have no impact on WACC. 1

Alternative position is that there is optimal capital structure i.e. not enough gearing and too much gearing with risk of bankruptcy resulting in exponential growth of the WACC. 1

Additional mark for the correctly drawn graphs depicting the traditional and M&Ms views. 1

Cost of capital with different capital structures



The market appears to be responding in the 'traditional' manner because the WACC has fallen. However, this reduction might be largely due to the tax shield effect in which case revised M&M theory might apply because the cost of equity has actually risen albeit slightly. 1

Another point to raise is that the level of indebtness within the new capital structure is quite high with share of equity falling below 50%. Surely if the company is to issue more debt in these uncertain times, the rise in the cost of equity might be disproportiantely high if one is to subscribe to the traditional view on capital structure. 1

The new capital structure is risker due to shorter maturity of a portion of its debt (now matures in 2 years time). If economic conditions translate into dififiCulties with future borrowing, the company might face a significant short fall in its finances. 1

Allocate marks for other relevant points, capped at 6

Marks 6

Overall 30 marks