

Finance for Business

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Question 1-

- a. The key responsibility of the CFO is to maximize the profits Vis a Vis minimizing the risk. The CFO plays a major role in deciding the dividend payout policy and deciding capital structure of the company. The CFO has to assess for various options available to raise funds comparing the cost of capital and expected rate of return.

Following is the three important concepts of corporate finance.

1. Investments & Capital Budgeting
2. Capital Financing

3. Dividends and Return of Capital

a. Calculation of owner's equity

Owner's equity is net of total assets and total liabilities

Total Assets	
Current Assets	7,920
Net Fixed Assets	<u>17,700</u>
	25,620
Total Liabilities	
Current Liabilities	4,580
Long Term Debt	<u>5,890</u>
	10,470
Owner's Equity	<u><u>15,150</u></u>
(Assets-Liabilities)	

Risk Surfing Ltd Balance Sheet as on _____

Liabilities	Amount (in \$)	Assets	Amount (in \$)
Equity Capital	15,150	Net Fixed Assets	17,700
Long Term Debt	5,890		
Current Liabilities	4,580	Current Assets	7,920
	<u>25,620</u>		<u>25,620</u>

- b. Net Working capital of the company: Net Working capital is a difference between current assets and current liabilities. It reflects liquidity of the company to run a business

Current Assets	7,920
Current Liabilities	<u>4,580</u>
Net Working Capital	<u><u>3,340</u></u>

- c. Return on Asset (ROA): Return on assets is a % of profit earned by the company using its total assets.

$$\text{ROA} = \text{Net Income} / \text{Total Assets}$$

Here net income is not given however return on equity is 30% and we have calculated Shareholder's Equity as above therefore firstly we will calculate Net Income

ROE 30%

$$\text{ROE} = \text{Net Income} / \text{Shareholder's Equity}$$

$$30\% = \text{Net Income} / 15150$$

$$\text{Net Income} = 15150 * 30\%$$

$$\text{Net Income} = 4545 \$$$

$$\text{ROA} = 4545 / 25620$$

$$\text{ROA} = 17.74\%$$

- d. PE of the company: PE ratio stands for price earnings ratio of the company which helps investor to determine market value of shares of the company

$$\text{PE Ratio} = \text{Market Price per share} / \text{EPS}$$

No of shares outstanding	2,000
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Market price	12
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EPS is an earnings per share which is profit divided by no of shares

$$\text{EPS} = \text{Net Profit} / \text{No of shares}$$

$$\text{EPS} = 4545 / 2000 = 2.27\$$$

$$\text{PE Ratio} = \text{Market Price per share} / \text{EPS}$$

$$\text{PE Ratio} = 12 / 2.27 = 5.28\$$$

The shares of Risk Surfing Ltd id overvalued as it has PE of Rs 5.28 as against market price of 12

Question 2

- a. **Effective annual interest rate (EAR):**EAR is the rate of interest which is equivalent to per annum rate when interest is compounded annually, semiannually or half yearly

$$\text{Effective Annual Rate} = (1 + (\text{nominal interest rate} / \text{number of compounding periods})) ^{\text{number of compounding periods}} - 1$$

	Bank 1	Bank 2
Rate of return	8.50%	8.45%
Compounding Period	Semi Annual	Quarterly
Period	15 Years	15 Years
Nominal Interest Rate	8.50%	8.45%

Number of Compounding Periods	30	60
Effective Annual Rate	8.86%	8.81%

Molly should choose Bank A as EAR is 8.86% which is higher than EAR of Bank B

- b. Accumulated investment at the end of the 15 year will be amount invested plus effective rate of interest for 15 years

$$\text{Accumulated investment} = \text{Investment} * (1 + \text{EAR})^{\text{period}}$$

Investment value	120000
EAR	8.81%
Investment period	15 years
Maturity Value	425855

Accumulated investment at the end of 15 year is \$ 425855

- c.

Let the required rate of return be r

Principal amount = \$120,000

Time = 10 years

Future/accumulated value at the end of 10th year = \$450,000

Accumulated value = Principal amount * $(1 + r)^{\text{Time}}$

$$450,000 = 120,000 * (1 + r)^{10}$$

$$r = 14.13\%$$

- d. Let the monthly payment be \$C

Future Value (FV) = \$330,000

Rate of return (i) = 7% per year, compounding monthly or 0.58% per period

Time (n) = 15 years or 180 periods ($15 * 12$)

$$FV = C * ((1 + i)^n - 1) / i$$

$$330,000 = C * ((1 + 0.58\%)^{180} - 1) / 0.58\%$$

$$C = \$1,044.76$$

- e. Let the future value after 15 years be FV

Monthly payment at the beginning of each month (C) = \$1,200

Rate of return (i) = 7% per year, compounding monthly or 0.58% per period

Time (n) = 15 years or 180 periods ($15 * 12$)

$$FV = C * ((1 + i)^n - 1) * (1 + i) / i$$

$$FV = 1,200 * ((1 + 0.58\%)^{180} - 1) * (1 + 0.58\%) / 0.58\%$$

$$FV = \$381,233.40$$

- f.

Future value	0
Payment	-1200
Discount Rate	7%
Time period	15

Compounding
Future value

Monthly
₹ 3,80,354.76

The molly will Get Rs. 380354 if she invests Rs 1200 per month @ 7% compounded monthly

Question 3

- a. Geometric average return: Geometric average return can be calculated using the following formula:

Geometric Average Return

$$= ((1 + R_1) \times (1 + R_2) \times \dots \times (1 + R_n))^{(1/n)} - 1$$

Where,

R_1 , R_2 and R_n are sub-period returns for period 1, 2 and n , respectively,
and

N is the total number of sub-periods for which return is available.

Alternatively, we can also calculate it using the Excel GEOMEAN function.

	Market return	1+return
Year 1	9.70%	109.70%
Year 2	-6.20%	93.80%
Year 3	12.10%	112.10%
Year 4	11.50%	111.50%
Year 5	13.30%	113.30%
Geometric Mean		0.07821
Geometric Average return		7.82%

- b.

Given,

Expected Return	14.60%
Risk Premium	5.80%
Risk free rate of return	5.90%
Inflation Rate	2.7

The Capital Asset Pricing Model (CAPM) is a model that describes the relationship between the expected return and risk of investing in a security.

Expected return of stock A = 14.6%

Risk premium = 5.8%

Risk-free rate of return = 5.9%

According to CAPM,

Expected return = Risk-free rate of return + Beta * Risk premium

$$14.6\% = 5.9\% + \text{Beta} * 5.8\%$$

$$\text{Beta} = 1.50$$

c.

Investment Value		1,200
No of shares purchase		200
Cost per share		6
Market price		75
Dividend paid		2
	Per share	Total
Sale consideration	75	15,000
Cost of Acquisition	6	1,200
Capital Gain	69	13,800

d.

	A	B
Expected returns	12.50%	18.50%
Standard Deviation	15%	20%
Correlation of Coefficient	0.4	
Weightage of stock in portfolio	45%	55%
Expected retrun in portfolio	5.625	10.175
Total Expected Return	15.8	

$$\text{Variance} = w_A^2 * \sigma_A^2 + w_B^2 * \sigma_B^2 + 2 * \rho_{A,B} * w_A * w_B * \sigma_A * \sigma_B$$

$$\text{Portfolio Variance} = 2.26\%$$

Where:

w_i – the weight of the i th asset

σ_i^2 – the variance of the i th asset

$\rho_{A,B}$ – the covariance between assets 1 and 2

Standard deviation is the square root of variance

$$\text{Standard deviation for above} = 15.03\%$$

Question 4:

a. Current price of corporate bond:

Par Value of the bond	1000
Coupon Rate	12%
Coupon (12% of 1000)	120
Maturity (Number of Years)	25
Yield / Interest Rate	10%

Price of bond is calculated using the formula given below

$$\text{Bond Price} = \sum (C_n / (1+YTM)^n) + P / (1+i)^n$$

Bond Price	1075.8
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b. Current price of ordinary shares

Given,

Outstanding Shares	65000
Dividend per share	7.5
Annual growth rate of dividend	3%
Average rate of return	9%

Current price of stock = (dividend per share) / (discount rate - growth rate)	125
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c. Current value of preferred share

Given,

Outstanding Shares	40000
Face Value	100
Dividend Rate	14%
Average rate of return	12%

$$V = \text{Value of Preference Share } D/i$$

D = Annual Dividend per Preference Share	14
i = Discount Rate on Preference Shares	12%
Value of preferred Shares	116.67

d. Current market value and capital structure of the firm

No of Ordinary Shares	65,000	
Current market price as calculated in b	125	
Equity Share Capital		81,25,000
No of preferred stock	40,000	
Face Value	100	
Preferred Stock		40,00,000
Bond Value	25,00,000	
Face Value	1,000	

No of Bonds issued	2,500	
Bond price as calculated in a	1,076	
Market Value of Bond		26,89,539
Current market value of the firm		1,48,14,539

Capital Structure

	Amount	%
Equity	81,25,000	55.56
Preferred	40,00,000	27.35
Debt	25,00,000	17.09
Total	1,46,25,000	100

Total Weights of equity funding is 82.91 % i.e. total of equity & preferred

e. Weighted Average cost of capital:

Firstly, we need to calculate cost of ordinary equity using dividend constant growth model which is as under:

$$\text{Price} = D/(r-g)$$

Dividend	7.5
Growth rate of dividend	3%
Required rate of return	9%

Cost of ordinary shares 125

The weighted average cost of capital (WACC) is a calculation of a firm's cost of capital in which each category of capital is proportionately weighted. All sources of capital, including common stock, preferred stock, bonds

$$\text{WACC} = (E/V \times Re) + ((D/V \times Rd) \times (1 - T)) + (P/V \times Rp)$$

Where:

D = market value of the firm's debt

V = total value of capital (equity plus debt)

E/V = percentage of capital that is equity

D/V = percentage of capital that is debt

Re = cost of equity (required rate of return)

T = tax rate

P = market value of preferred stock

Rp = Cost of preferred stock

Capital Structure	Value	Proportion	Cost
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Equity	81,25,000	55.56	9%
Preferred	40,00,000	27.35	14%
Debt	25,00,000	17.09	10.00%
Total	<u>1,46,25,000</u>	<u>100</u>	
WACC		10.03%	

Question 5

a.

	Equipment 1	Equipment 2
Cost	1,86,000	1,95,000
Future Cash Flow		
Year 1	86,000	97,000
Year 2	93,000	84,000
Year 3	83,000	86,000
Year 4	75,000	75,000
Year 5	55,000	63,000
Rate of Return	8%	8%

PI is the measure to compare the present value of future cash flow as against the initial investment.

PI > 1, Project is profitable

PI = 1, Project is at break-even point

PI < 1, Project will bring losses

$$\text{Profitability Index} = \frac{\text{Present Value of Future Cash Flow}}{\text{Initial Investment}}$$

The higher the profitability index, the more attractive the investment.

	Equipment 1		Equipment 2	
	Cash Flow	Discounted Cash Flow	Cash Flow	Discounted Cash Flow
Cost	1,86,000		1,95,000	
Future Cash Flow				
Year 1	86,000	79,630	97,000	89,815
Year 2	93,000	79,733	84,000	72,016
Year 3	83,000	65,888	86,000	68,270
Year 4	75,000	55,127	75,000	55,127
Year 5	55,000	37,432	63,000	42,877
	3,92,000	3,17,810	4,05,000	3,28,105
Rate of Return		8%		8%

Profitability Index =	<u>Present Value of Future Cash Flow</u>	
	Initial Investment	
	<u>3,17,810</u>	<u>3,28,105</u>
	1,86,000	1,95,000
Profitability Index =	1.71	1.68

The company should accept equipment 1 as the PI is higher as compared to Equipment 2

- b. Discounted Payback Period: The discounted payback period is used to evaluate the profitability and timing of cash inflows of a project or investment. In this metric, future cash flows are estimated and adjusted for the time value of money. It is the period of time that a project takes to generate cash flows when the cumulative present value of the cash flows equals the initial investment cost.

Equipment 1:

Year	Cash flows	Discounted Cash flows	Cumulative Discounted cash flows
0	(186,000)	(186,000)	(186,000)
1	86,000	79,630	(106,370)
2	93,000	79,733	(26,638)
3	83,000	65,888	
4	75,000	55,127	
5	55,000	37,432	

Discounted payback period = 2 + 26,638 / 65,888

Discounted payback period = 2.40 years

Equipment 2:

Year	Cash flows	Discounted Cash flows	Cumulative Discounted cash flows
0	(195,000)	(195,000)	(195,000)
1	97,000	89,815	(105,185)
2	84,000	72,016	(33,169)
3	86,000	68,270	
4	75,000	55,127	
5	63,000	42,877	

Discounted payback period = 2 + 33,169 / 68,270

Discounted payback period = 2.48 years

The company should not accept any of the equipment as company's maximum payback criteria is 2 years and both the above equipment exceed the payback period of 2 years

Question 6

- a. **Ex-dividend date & Ex dividend price:**When a company announce a dividend, the company set a record date for payment. The Ex-dividend date will be set after the record date as per the stock exchange rule

The investor will ready to buy a share before ex-dividend date as he knows that he will be going to earn a dividend he may intend to pay premium also

Usually after the ex-dividend date the price of stock will reduce to the extent of dividend and tax payable thereon and that is known as ex dividend price of shares.

Market Value per share	22
Cash Dividend	4.5
Extra Dividend	1.5
Total Dividend	6
Tax on dividend @ 25%	1.5
Ex dividend price	14.5

It is assumed that company is liable to pay tax on dividends and therefore that will also be deducted from its share price along with amount of dividend paid

- b. **Residual Dividend Payout:** With a residual dividend policy, the firm’s objective is to meet its investment needs and maintain its desired debt-equity ratio before paying dividends. If funds needed by a company is less than the profits earned than balance amount is distributed as dividend ensuring that the desired debt-equity ratio is maintained by the company

Capital Requirement	7,45,000
Equity Ratio	60%
Debt Ratio	40%
 Net Income	 25,75,000

Using the residual dividend approach dividend will be calculated as under:

Net Income		25,75,000
Capital Budget	7,45,000	
Target Equity Ratio	60%	4,47,000
Dividend Payout		21,28,000
 Dividend Payout Ratio		 83%

c.

Rate of Return	13.50%	
Dividend paid now	3.5	Million \$
Liquidating Dividend	8.5	Million \$
Total Dividend	12	Million \$
Share outstanding	2.5	Million \$
Dividend per share	4.8	

As the company is going to liquidate the company will pay the balance earnings in the form of dividend to its owners

The company is going to pay total 12\$ million of dividend. Therefore, we will get the value of firm's equity by dividing total dividend payment to its required rate of return

Value of firms Equity	88.89	Million \$
No of shares outstanding	2.50	Million \$
Value per share	35.56	Million \$