

Current Market Price per Share	₹ 150	₹ 70
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Other Information:

Risk Free Rate of Return	7%
Market Rate of Return	14%

- (i) Calculate the price of shares of both the companies.
- (ii) Write the comment on the valuation on the basis of price calculated and current market price.
- (iii) As an investor what course of action should be followed?

**(Exam December – 2021)**

**Solution:**

**(i) Calculation of Prices of Shares of both Companies**

	X Ltd.	Y Ltd.
Beta	0.9	1.20
Cost of Equity using CAPM	$7\% + 0.9[14\% - 7\%]$ = 13.30%	$7\% + 1.20 [14\% - 7\%]$ = 15.40%
Growth Rate	10%	10%
Price of Share	$\frac{4 \times 1.10}{0.133 - 0.10} = \frac{4.40}{0.033}$ = ₹ 133.33	$\frac{4 \times 1.10}{0.154 - 0.10} = \frac{4.40}{0.054}$ = ₹ 81.48

**(ii) and (iii)**

Name of Company	Current Market Price	Value of the Share	Valuation	Action of the Investor
X Ltd.	₹ 150.00	₹ 133.33	Overvalued/ overpriced	Not to Invest/to be sold
Y Ltd.	₹ 70.00	₹ 81.48	Undervalued/ underpriced	Invest/to be purchased

**Question – 42**

On the basis of the following information:

Current dividend ( $D_0$ ) = ₹ 2.50

Discount rate ( $k$ ) = 10.5%

Growth rate ( $g$ ) = 2%

- (i) Calculate the present value of stock of ABC Ltd.
- (ii) Is its stock overvalued if stock price is ₹ 35, ROE = 9% and EPS = ₹ 2.25? Show detailed calculation.

(SM TYK – 04 & MTP – 2022)

**Solution:****(1) Present Value of Stock**

$$\begin{aligned} P_0 &= \frac{D_1}{K_e - g} \\ &= \frac{2.50 (1.02)}{0.105 - 0.02} \\ &= ₹ 30 \end{aligned}$$

**(2) Present Value of Stock****(a) P/E Model**

$$\begin{aligned} P/E &= \frac{1}{K_e} \\ &= \frac{1}{9\%} = 11.11 \end{aligned}$$

$$\begin{aligned} \text{MPS} &= \text{EPS} \times \text{P/E Ratio} \\ &= ₹ 2.25 \times 11.11 \\ &= ₹ 25 \end{aligned}$$

Actual price is more than intrinsic value, hence share is overpriced.

**(b) Earning Growth Model**

$$\begin{aligned}
 P_0 &= \frac{\text{EPS} (1 + g)}{K_e - g} \\
 &= \frac{2.25 (1.02)}{0.09 - 0.02} = ₹ 32.79
 \end{aligned}$$

Stock is overpriced

**Question – 43**

The risk free rate of return  $R_f$  is 9 percent. The expected rate of return on the market portfolio  $R_m$  is 13 percent. The expected rate of growth for the dividend of Platinum Ltd. is 7 percent. The last dividend paid on the equity stock of firm A was ₹ 2.00. The beta of Platinum Ltd. equity stock is 1.2.

- (i) What is the equilibrium price of the equity stock of Platinum Ltd.?
- (ii) How would the equilibrium price change when
- The inflation premium increases by 2 percent?
  - The expected growth rate increases by 3 percent?
  - The beta of Platinum Ltd. equity rises to 1.3?

(SM TYK – 15)

**Solution:****(1) Equilibrium Price**

$$\begin{aligned}
 P_0 &= \frac{D_1}{K_e - g} \\
 K_e &= R_f + \beta (R_m - R_f) \\
 &= 9 + 1.2 (13 - 9) \\
 &= 13.8\% \\
 P_0 &= \frac{2 (1.07)}{0.138 - 0.07} \\
 &= ₹ 31.47
 \end{aligned}$$

**(2) Assumption 1**

Each factor independently

\* Inflation premium ↑ 2%

$$K_e = 11 + 1.2 (15 - 11) = 15.8\%$$

$$P_0 = \frac{2 (1.07)}{0.158 - 0.07} = ₹ 24.32$$

\* Growth Rate ↑ 3%

$$P_0 = \frac{2 (1.10)}{0.138 - 0.10} = ₹ 57.89$$

\* Beta = 1.30

$$K_e = 9 + 1.30 (13 - 09) = 14.2\%$$

$$P_0 = \frac{2 (1.07)}{0.142 - 0.07} = ₹ 29.72$$

**Assumption II [All Factors Change Simultaneously]**

$$K_e = 11 + 1.30 (15 - 11) = 16.20\%$$

$$P_0 = \frac{2 (1.10)}{0.162 - 0.10} = ₹ 35.48$$

**Question - 44**

Mr. X has submitted the following data:

Particulars	(₹) in Lakhs
Total Assets	250
Total Liabilities	220
Net Income	12
Dividend Paid	4.5
Sales	100

Mr. X wants to know to what extent sales can be increased without going for additional borrowings by using Sustainable Growth Rate (SGR) Concept?

**(Exam Nov - 2022)**

**Solution:**

SGR

$$\text{Equity} = 250 - 220 = ₹ 30 \text{ lacs}$$

$$\begin{aligned} \text{Retain Earning} &= 12 - 4.50 \\ &= 7.50 \text{ lacs} \end{aligned}$$

$$\text{Retention Ratio (b)} = \frac{7.50}{12} \times 100 = 62.5\%$$

$$\begin{aligned} \text{ROE (r)} &= \frac{\text{NI}}{\text{Equity}} \times 100 \\ &= \frac{12}{30} \times 100 = 40\% \end{aligned}$$

$$\begin{aligned} \text{SGR} &= b \times r \\ &= 0.625 \times 0.40 = 25\% \end{aligned}$$

Sales will increment by 25% i.e.  $100 \times 25\% = ₹ 25 \text{ lacs}$

**MULTIPLE GROWTH MODEL****Question - 45**

MNP Ltd. has declared and paid annual dividend of ₹ 4 per share. It is expected to grow @ 20% for the next two years and 10% thereafter. The required rate of return of equity investors is 15%. Compute the current price at which equity shares should sell.

Note: Present Value Interest Factor (PVIF) @ 15%:

For year 1 = 0.8696;

For year 2 = 0.7561

**(SM TYK - 03)****Solution:**

$$D_0 = ₹ 4$$

$$D_1 = ₹ 4 (1.20) = ₹ 4.80$$

$$D_2 = ₹ 4 (1.20)^2 = ₹ 5.76$$

$$D_3 = ₹ 4 (1.20)^2 (1.10) = ₹ 6.336$$

$$TV = \frac{D_3}{(k_e - g)} = \frac{6.336}{0.15 - 0.10} = 126.72$$

$$P = \frac{4.80}{(1 + 0.15)} + \frac{5.76}{(1 + 0.15)^2} + \frac{126.72}{(1 + 0.15)^2}$$

$$= 4.80 \times 0.8696 + 5.76 \times 0.7561 + 126.72 \times 0.7561$$

$$= 104.34$$

**Question – 46**

M/s. B Ltd. has declared dividend of ₹ 2.50 per share on the EPS of ₹ 7. Earnings of the company are expected to grow at the rate of 10% for the next 3 years and to be stabilized at 3% thereafter.

The pay-out ratio is expected to remain at the same level during 3 years and then will increase to 60%. If required rate of return is 16% calculate:

- (i) The current price of the share.
- (ii) The expected price of share of B Ltd. At the end of 3<sup>rd</sup> year.

Following table may be used for calculations.

Present Value	t <sub>1</sub>	t <sub>2</sub>	t <sub>3</sub>	t <sub>4</sub>	t <sub>5</sub>
PVIF <sub>0.16,t</sub>	0.862	0.743	0.641	0.553	0.477

(Exam Jan – 2021)

**Solution:**

**EPS & DPS**

	1	2	3	4
EPS (₹ 27)	7.70	8.47	9.317	9.597
DPS (2.50)	2.75	3.025	3.328	5.758

**Stage I**

$$P.V. = (2.75 \times 0.862) + (3.025 \times 0.743) + (3.328 \times 0.641)$$

$$= ₹ 6.751$$

**Stage II**

$$P_3 = \frac{D_4}{K_e - g}$$

$$= \frac{5.758}{0.16 - 0.03}$$

$$= ₹ 44.29$$

$$= ₹ 44.29 \times 0.641 = 28.39$$

$$P_0 = 6.751 + 28.39$$

$$= ₹ 35.141$$

**Question – 47**

X Limited, just declared a dividend of ₹14.00 per share Mr. B is planning to purchase the share of X Limited, anticipating increase in growth rate from 8% to 9%, which will continue for three years. He also expects the market price of this share to be ₹ 360.00 after three years.

You are required to determine:

- (i) the maximum amount Mr. B should pay for shares, if he requires a rate of return of 13% per annum.
- (ii) the maximum price Mr. B will be willing to pay for share, if he is of the opinion that the 9% growth can be maintained indefinitely and require 13% rate of return per annum.
- (iii) the price of share at the end of three years, if 9% growth rate is achieved and assuming other conditions remaining same as in (ii) above.

Calculate rupee amount up to two decimal points.

	Year-1	Year-2	Year-3
FVIF @ 9%	1.090	1.188	1.295
FVIF @ 13%	1.130	1.277	1.443
PVIF @ 13%	0.885	0.783	0.693

**Solution:**

**(i) Expected dividend for next 3 years.**

$$\text{Year 1 (D}_1\text{)} \quad ₹ 14.00 (1.09) \quad = ₹ 15.26$$

$$\text{Year 2 (D}_2\text{)} \quad ₹ 14.00 (1.09)^2 \quad = ₹ 16.63$$

$$\text{Year 3 (D}_3\text{)} \quad ₹ 14.00 (1.09)^3 \quad = ₹ 18.13$$

Required rate of return = 13% (K<sub>e</sub>)

Market price of share after 3 years = (P<sub>3</sub>) = ₹ 360

The present value of share

$$P_0 = \frac{15.26}{(1 + 0.13)} + \frac{16.63}{(1 + 0.13)^2} + \frac{18.13}{(1 + 0.13)^3} + \frac{360}{(1 + 0.13)^3}$$

$$P_0 = 15.26(0.885) + 16.63(0.783) + 18.13(0.693) + 360(0.693)$$

$$P_0 = 13.50 + 13.02 + 12.56 + 249.48$$

$$P_0 = ₹ 288.56$$

**(ii)** If growth rate 9% is achieved for indefinite period, then maximum price of share should Mr. A willing be to pay is

$$P_0 = \frac{D_1}{(1 - k_e)} = \frac{₹ 15.26}{(0.13 - 0.09)} = \frac{₹ 15.26}{0.04} = ₹ 381.50$$

**(iii)** Assuming that conditions mentioned above remain same, the price expected after 3 years will be:

$$P_3 = \frac{D_4}{k_e - g} = \frac{D_3(1.09)}{0.13 - 0.09} = \frac{18.13 \times 1.09}{0.04} = \frac{19.76}{0.04} = ₹ 494$$

**Question – 48**

XYZ Ltd. paid a dividend of ₹ 2 for the current year. The dividend is expected to grow at 40% for the next 5 years and at 15% per annum thereafter. The return on 182 days T-bills is 11% per annum and the market return is expected to be around 18% with a variance of 24%.

The co-variance of XYZ's return with that of the market is 30%. You are required to calculate the required rate of return and intrinsic value of the stock.

**(SM TYK – 17)**

**Solution:**

$$\begin{aligned} \text{Beta} &= \frac{\text{Cov}_{xm}}{\sigma_m^2} \\ &= \frac{30}{24} = 1.25 \end{aligned}$$

**Required Rate of Return**

$$\begin{aligned} K_e &= R_f + \beta (R_m - R_f) \\ &= 11 + 1.25 (18 - 11) \\ &= 19.75\% \end{aligned}$$

	Year	PVF (19.75%)	Amount	P.V.
Dividend				
2 (1.40) <sup>1</sup>	1	0.835	2.80	2.34
2.80 × 1.40	2	0.697	3.92	2.73
3.92 × 1.40	3	0.582	5.488	3.19
5.488 × 1.40	4	0.486	7.683	3.73
7.683 × 1.40	5	0.406	10.756	4.37
Terminal value (W.N.1)	5	0.406	260.41	105.77
			<b>P<sub>0</sub></b>	<b>122.13</b>

**Terminal Value**

$$\begin{aligned} P_5 &= \frac{D_6}{K_e - g} \\ &= \frac{10.756 (1.15)}{0.1975 - 0.15} \\ &= ₹ 260.41 \end{aligned}$$

**Question – 49**

Mr. A is thinking of buying shares at ₹ 500 each having face value of ₹ 100. He is expecting a bonus at the ratio of 1:5 during the fourth year. Annual expected

dividend is 20% and the same rate is expected to be maintained on the expanded capital base. He intends to sell the shares at the end of seventh year at an expected price of ₹ 900 each. Incidental expenses for purchase and sale of shares are estimated to be 5% of the market price. He expects a minimum return of 12% per annum.

Should Mr. A buy the share? If so, what maximum price should he pay for each share? Assume no tax on dividend income and capital gain.

**(SM TYK – 14 & RTP November – 2019)**

**Solution:**

**NPV**

	Year	PVF (12%)	Amount	P.V.
Dividend				
₹ 100 × 20%	1	0.893	20.00	17.86
	2	0.797	20.00	15.94
	3	0.712	20.00	14.24
₹ 100 × 20% × 1.2 shares	4	0.636	24.00	15.26
	5	0.567	24.00	13.61
	6	0.507	24.00	12.17
	7	0.452	24.00	10.85
Sell Share 900 × 1.20 × 0.95	7	0.452	1026.00	463.75
			P.V. CI =	₹ 563.68

$$\text{NPV} = ₹ 563.68 - 500 \times 1.05$$

$$= ₹ 38.68$$

Since NPV is positive, hence share should be purchased.

$$\text{Maximum price} = \frac{₹ 563.68}{1.05}$$

$$= ₹ 536.84$$

**Question – 50**

Seawell Corporation, a manufacturer of do-it-yourself hardware and house wares, reported earnings per share of € 2.10 in 2003, on which it paid dividends per share of €0.69. Earnings are expected to grow 15% a year from 2004 to 2008, during this period the dividend payout ratio is expected to remain unchanged. After 2008, the earnings growth rate is expected to drop to