a stable rate of 6%, and the payout ratio is expected to increase to 65% of earnings. The firm has a beta of 1.40 currently, and is expected to have a beta of 1.10 after 2008. The market risk premium is 5.5%. The Treasury bond rate is 6.25%.

(a) What is the expected price of the stock at the end of 2008?

(b) What is the value of the stock, using the two-stage dividend discount model?

(RTP May – 2019)

Solution:

Working Note 1: Calculation of EPS & EPS

	2004	2005	2006	2007	2008	2009
EPS (2.10)	2.415	2.777	3.194	3.673	4.224	4.477
DPS (0.69)	0.794	0.913	1.049	1.207	1.388	2.910

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

Before 2008

$K_e = 6.25 + 1.40 \times 5.5 = 13.95$

After 2008

$K_e = 6.25 + 1.10 \times 5.5 = 12.30$

(1) Expected price at the end of 2008

$$P_5 = \frac{D_6}{K_e - g}$$

$$= \frac{2.910}{0.1230 - 0.06} = € 46.19$$

(2) Present Value of stock

Stage I

P.V. = (0.794 × 0.878) + (0.913 × 0.770) + (1.049 × 0.676) + (1.207 × 0.593) + (1.388 × 0.521)

= € 3.548

Stage II

= € 46.19 × 0.521

= € 24.065

P_0 = € 3.548 + € 24.065

= € 27.613

Question – 51

The current EPS of M/s VEE Ltd. is ₹ 4. The company has shown an extraordinary growth of 40% in its earnings in the last few years this high growth rate is likely to continue for the next 5 years after which growth rate in earnings will decline from 40% to 10% during the next 5 years and remain stable at 10% thereafter. The decline in the growth rate during the 5 years transition period will be equal and linear. Currently, the company's pay-out ratio is 10%. It is likely to remain the same for the next five years and from the beginning of the sixth year till the end of the 10th year, the pay-out will linearly increase and stabilize at 50% at the end of the 10th year. The post tax cost of capital is 17% and the PV factors are given below:

Years	1	2	3	4	5	6	7	8	9	10
PVIF @17%	0.855	0.731	0.625	0.534	0.456	0.390	0.333	0.285	0.244	0.209

You are required to Calculate the intrinsic value of the company's stock based on expected dividend. if the current market price of the stock is ₹ 125, suggest if it is advisable for the investor to invest in the company's stock or not.

(Exam November – 2019)

Solution:

Calculation of EPS & DPS

	1	2	3	4	5	6	7	8	9	10
Growth	40%	40%	40%	40%	40%	34%	28%	22%	16%	10%
EPS (4)	5.60	7.84	10.976	15.366	21.513	28.827	36.899	45.017	52.220	57.441
DPR	10%	10%	10%	10%	10%	18%	26%	34%	42%	50%
DPS	0.56	0.784	1.098	1.537	2.151	5.189	9.594	15.306	21.932	28.721
PVF	0.855	0.731	0.625	0.534	0.456	0.390	0.333	0.285	0.294	0.209

Stage I: Present value of dividend = ₹ 24.47

Stage II: Present value of terminal value

$$P_{10} = \frac{D_{11}}{K_e - g}$$

$$= \frac{28.721\ (1.10)}{0.17 - 0.10}$$

$$= ₹\ 451.33 \times 0.209$$

$$= 94.328$$

$$IV_0 = 24.47 + 94.328$$

$$= ₹\ 118.798$$

As Intrinsic Value of the share is lower than its selling price of ₹ 125, it is overprized and can not be acquired.

Question – 52

An investor is considering to purchase the equity shares of LX Ltd., whose current market price (CMP) is ₹ 112. The company is proposing a dividend of ₹ 4 for the next year. LX Ltd. is expected to grow @ 20 per cent per annum for the next four years. The growth will decline linearly to 16 per cent per annum after first four years. Thereafter, it will stabilize at 16 per cent per annum infinitely. The investor requires a return of 20 per cent per annum.

You are required

(i) To calculate the intrinsic value of the share of LX Ltd.

(ii) Whether it is worth to purchase the share at this price.

Period	1	2	3	4	5	6	7
PVIF (20%,n)	0.833	0.694	0.579	0.482	0.402	0.335	0.279

(Exam November – 2020)

Solution:

D_1 = ₹ 4

D_2 = ₹ 4 (1.20) = ₹ 4.80

D_3 = ₹ 4 $(1.20)^2$ = ₹ 5.76

D_4 = ₹ 4 $(1.20)^3$ = ₹ 6.91

D_5 = ₹ 6.91 (1.19) = ₹ 8.22

D_6 = ₹ 6.91 (1.19) (1.18) = ₹ 9.70

D_7 = ₹ 6.91 (1.19) (1.18) (1.17) = ₹ 11.35

D_8 = ₹ 6.91 (1.19) (1.18) (1.17) (1.16) = ₹ 13.17

$$TV_7 = \frac{D_8}{k_e - g} = \frac{13.17}{0.20 - 0.16} = ₹\ 329.25$$

$$P = \frac{4.00}{(1 + 0.20)} + \frac{4.80}{(1 + 0.20)^2} + \frac{5.76}{(1 + 0.20)^3} + \frac{6.91}{(1 + 0.20)^4} + \frac{8.22}{(1 + 0.20)^5} +$$

$$\frac{9.70}{(1 + 0.20)^6} + \frac{11.35}{(1 + 0.20)^7} + \frac{329.25}{(1 + 0.20)^7}$$

= 4.00 × 0.833 + 4.80×0.694 + 5.76 × 0.579 + 6.91 × 0.482 + 8.22 × 0.402 + 9.70 × 0.335 + 11.35 × 0.279 + 329.25 × 0.279

(i) Intrinsic Value = ₹ 114.91

(ii) As Intrinsic Value of the share is higher than its selling price of ₹ 112, it is underpriced and can be acquired. However, other factors need to be taken into consideration since difference is only slightly higher.

Question – 53

SAM Ltd. has just paid a dividend of ₹ 2 per share and it is expected to grow @ 6% p.a. After paying dividend, the Board declared to take up a project by retaining the next three annual dividends. It is expected that this project is of same risk as the existing projects. The results of this project will start coming from the 4th year onward from now. The dividends will then be ₹ 2.50 per share and will grow @ 7% p.a.

An investor has 1,000 shares in SAM Ltd. and wants a receipt of at least ₹ 2,000 p.a. from this investment.

Show that the market value of the share is affected by the decision of the Board. Also show as to how the investor can maintain his target receipt from the investment for first 3 years and improved income thereafter, given that the cost of capital of the firm is 8%.

Solution:

Market Price (P_0)

(i) If not accept the project

$$P_0 = \frac{D_1}{K_e - g}$$

$$= \frac{₹\ 2\ (1.06)}{0.08 - 0.06}$$

$$= ₹\ 106$$

(ii) If accept the project

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

$$= \frac{₹\ 2.50}{0.08 - 0.07} = ₹\ 250$$

$$P_0 = \frac{₹\ 250}{(1.08)^3} = ₹\ 198.46$$

Since value of share will increase hence accept the project.

If investor wants receipt of ₹ 2,000 p.a., then he should sell shares.

1st Year

$$P_1 = \frac{₹\ 250}{(1.08)^2} = ₹\ 214.33$$

$$\text{No. of shares} = \frac{₹\ 2,000}{214.33} = 9.33 \text{ shares i.e. [10 shares]}$$

2nd Year

$$P_2 = \frac{₹\ 250}{(1.08)^1} = ₹\ 231.48$$

$$\text{No. of shares} = \frac{₹\ 2,000}{₹\ 231.48} = 8.64 \text{ shares i.e. [9 shares]}$$

3rd Year

P_3 = ₹ 250

No. of shares = $\frac{₹\ 2,000}{250}$ = 8 shares

Remaining shares = 1,000 – 10 – 9 – 8

= 973 shares

At the end of 3rd year, he would be having 973 shares valued @ ₹ 250 each i.e. ₹ 2,43,250. On these 973 shares, his dividend income for year 4 would be @ ₹ 2.50 i.e. ₹ 2,432.50.

So, if the project is taken up by the company, the investor would be able to maintain his receipt of at least ₹ 2,000 for first three years and would be getting increased income thereafter.

Question – 54

Piyush Loonker and Associates presently pay a dividend of Re. 1.00 per share and has a share price of ₹ 20.00.

(i) If this dividend were expected to grow at a rate of 12% per annum forever, what is the firm's expected or required return on equity using a dividend-discount model approach?

(ii) Instead of this situation in part (i), suppose that the dividends were expected to grow at a rate of 20% per annum for 5 years and 10% per year thereafter. Now what is the firm's expected, or required, return on equity?

(SM TYK – 06)

Solution:

(1) Cost of Equity

$K_e = \frac{D_1}{P_0} + g$

$= \frac{1(1.12)}{20} + 0.12$

= 17.60%

(2) Required Rate of Return

Assume K_e = 18%

$$P_0 = \frac{1.20}{(1.18)^1} + \frac{1.440}{(1.18)^2} + \frac{1.728}{(1.18)^3} + \frac{2.074}{(1.18)^4} + \frac{2.488}{(1.18)^5} + \frac{2.488\,(1.10)}{0.18-0.10} \times \frac{1}{(1.18)^5}$$

= ₹ 20.21

Assume K_e = 20%

$$P_0 = \frac{1.20}{(1.20)^1} + \frac{1.440}{(1.20)^2} + \frac{1.728}{(1.20)^3} + \frac{2.074}{(1.20)^4} + \frac{2.488}{(1.20)^5} + \frac{2.488\,(1.10)}{0.20-0.10} \times \frac{1}{(1.20)^5}$$

= ₹ 16.26

18%	20.21.
20%	16.00
2%	4.21

$$K_e = 18 + \left(\frac{2}{4.21}\right) \times 0.21$$

= 18.10%

Question – 55

An investor is considering purchasing equity shares of Alpha Ltd., whose current Market price is ₹ 172.45. The company is proposing a dividend of ₹ 6 for the year ending 31st march, 2024. Alpha Ltd. is expected to grow @ 20 percent per annum for the next four years. Thereafter, the growth, over the next three years, will decline linearly by 100 basis points per annum. Thereafter, it will stabilize at a certain growth rate per annum infinitely. The required rate of return for the investor is 20%.

Dividend value is to be taken in 2 decimal points only.

You are required:

(i) To calculate the stable growth rate of Alpha Ltd. after the end of 7 years.

(ii) To advise whether it is worth to purchase the share at this price if the investor has a stable target growth rate of 15% per annum.

Period	1	2	3	4	5	6	7
PVIF (20%, n)	0.8333	0.6944	0.5787	0.4823	0.4019	0.3349	0.2791

(Exam May – 2023)

Solution:

(i) Working Notes:

D_1 = ₹ 6

D_2 = 6 (1.20) = ₹ 7.20

D_3 = 6 (1.20) 2 = ₹ 8.64

D_4 = 6 (1.20) 3 = ₹ 10.37

D_5 = 10.37(1.19) = ₹ 12.34

D_6 = 10.37 (1.19) (1.18) = ₹ 14.56

D_7 = 10.37 (1.19) (1.18) (1.17) = ₹ 17.04

Price at the end of 7th year

Year	Dividend (₹)	PVF @ 20%	PV (₹)
1	6.00	0.8333	5.00
2	7.20	0.6944	5.00
3	8.64	0.5787	5.00
4	10.37	0.4823	5.00
5	12.34	0.4019	4.96
6	14.56	0.3349	4.88
7	17.04	0.2791	4.76
Total			34.60

Current Market Price	₹ 172.45
Less: PV of Dividends upto the year ending 7th year	₹ 34.60
PV of Expected Market Price at the end of 7th year	₹ 137.85

Let g be growth rate then: $137.85 = \frac{17.04\ (1+g)}{0.20-g} \times 0.2791$

g = 0.16 i.e. 16%

Thus, the stable growth rate after the end of the 7 years shall be 16%.

(ii) Since growth rate is more than target growth rate it is worth to purchase the share.

BUY BACK DECISION

Question – 56

Rahul Ltd. has surplus cash of ₹ 100 lakhs and wants to distribute 27% of it to the shareholders. The company decides to buy back shares. The Finance Manager of the company estimates that its share price after re-purchase is likely to be 10% above the buyback price-if the buyback route is taken. The number of shares outstanding at present is 10 lakhs and the current EPS is ₹ 3.

You are required to determine:

(i) The price at which the shares can be re-purchased, if the market capitalization of the company should be ₹ 210 lakhs after buyback,

(ii) The number of shares that can be re-purchased, and

(iii) The impact of share re-purchase on the EPS, assuming that net income is the same.

(SM TYK – 18)

Solution:

(i) Amount Available For Dividend

= ₹ 100 lakh × 27%

= ₹ 27 lakh

Let Assume buy back price be x

No. of shares × MPS = Market Capitalization

$\left(10 \text{ lakh} - \frac{27 \text{ lakh}}{x}\right) \times 1.10x = 210$

$11x - 29.70 = 210$

$x = ₹ 21.79$

(ii) No. of Shares Bought Back

$$\text{No.} = \frac{27,00,000}{21.79} = 1,23,910 \text{ shares}$$

(iii) Impact on EPS Due to Buy Back

EPS before buy back = ₹ 3

$$\text{After buy back} = \frac{₹\ 30,00,000}{10,00,000 - 1,23,910}$$

$= ₹ 3.424$

EPS increases to ₹ 3.424

Question – 57

Eager Ltd. has a market capitalization of ₹ 1,500 crores and the current market price of its share is ₹ 1,500. It made a PAT of 200 crores and the Board is considering a proposal to buy back 20% of the shares at a premium of 10% to the current market price. It plans to fund this through a 16% bank loan. You are required to calculate the post buy back Earnings Per Share (EPS). The company's corporate tax rate is 30%.

(MTP March – 2021)

Solution:

$$\text{No. of Shares} = \frac{1,500 \text{ Cr.}}{1,500}$$

$= 1$ Cr.

No. of shares buy back $= 1 \text{ Cr.} \times 20\%$

$= 0.20$ Cr.

Buy Back Price $= ₹ 1,500 \times 1.10$

$= ₹ 1,650$

Amount of buy back $= ₹ 1,650 \times 0.2$ Cr.