

OUTSCANNER

QUESTION BANK WITH VIDEO PODS

CA Final **AFM**

Sept 25 onwards

CMA Final **SFM**

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with
MCQs

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A. Dividend based Valuation Models



QUESTION 1:

N 10 | N 08

Amal Ltd. has been maintaining a growth rate of 12% in dividends. The company has paid dividend @ ₹3 per share. The rate of return on market portfolio is 15% and the risk-free rate of return in the market has been observed as 10%. The beta co-efficient of the company's share is 1.2.

You are required to calculate the expected rate of return on the company's shares as per CAPM model and the equilibrium price per share by dividend growth model.

Solution:

As per CAPM:

$$\begin{aligned} E_R &= R_f + \beta (R_m - R_f) \\ &= 10 + [1.2 (15 - 10)] \\ &= 16\% \text{ or } 0.16 \end{aligned}$$

Applying dividend growth mode for the calculation of equilibrium price:-

$$\begin{aligned} P_0 &= \frac{D_1}{K_e - g} \\ &= \frac{3(1.12)}{0.16 - 0.12} \\ &= ₹ 84 \end{aligned}$$

Therefore, equilibrium price per share will be ₹ 84.



QUESTION 2:

N 20 | N 11 | SM

A company has a book value per share of ₹ 137.80. Its return on equity is 15% and it follows a policy of retaining 60% of its earnings. If the Opportunity Cost of Capital is 18%, what is the price of the share today?

Solution:

$$\text{EPS} = 137.80 \times 15\% = 20.67$$

$$\text{DPS} = 20.67 \times (1 - 0.60) = 8.268$$

$$g = 0.15 \times 0.60 = 9\%$$

$$\begin{aligned} \text{Price of share } (P_0) &= \frac{D_1}{K_e - g} \\ &= \frac{8.268}{0.18 - 0.09} = 91.87 \end{aligned}$$



QUESTION 3:

SM | M 21 | M 05

A company's beta is 1.40. The market return is 14%. The risk free rate is 10% (i) What is the expected return based on CAPM (ii) If the risk premium on the market goes up by 2.5% points, what would be the revised expected return on this stock?

Solution:

$$\begin{aligned}
 \text{Expected Return} &= R_f + \beta (R_m + R_f) \\
 &= 10 + 1.40 (14 - 10) \\
 &= 15.6\% \\
 \text{Revised risk premium} &= (14\% - 10\%) + 2.5\% \\
 &= 6.5\% \\
 \text{Revised expected return} &= 10 + 1.40 (6.5) \\
 &= 19.1\%
 \end{aligned}$$



QUESTION 4:

N 21

Following are the details of X Ltd. and Y Ltd.:

Particulars	X Ltd.	Y Ltd.
Dividend per Share	₹ 4	₹ 4
Growth Rate	10%	10%
Beta	0.9	1.2
Current Market Price per Share	₹ 150	₹ 70

Other Information:

Risk Free Rate of Return 7%

Market Rate of Return 14%

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

Solution:

- a) 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	$= \frac{4.00}{0.133 - 0.10}$ $= ₹ 121.21$	$= \frac{4.00}{0.154 - 0.10}$ $= ₹ 74.07$

- b) and c) Comment on valuation and course of action:

Company	CMP	Value	Valuation	Action of the Investor
X Ltd.	₹ 150.00	₹ 121.21	Overvalued	Sell
Y Ltd.	₹ 70.00	₹ 74.07	Undervalued	Buy

**QUESTION 5:**

M 15

The following information is collected from the annual reports of J Ltd:

Profit before tax	₹ 2.50 crore
Tax rate	40 percent
Retention ratio	40 percent
Number of Outstanding shares	50,00,000
Equity capitalization rate	12 percent
Rate of return on investment	15 percent

What should be the market price per share according to Gordon's model of dividend policy?

Solution:

PBT	2,50,00,000
Less: Tax @ 40%	(1,00,00,000)
EAES	1,50,00,000
÷ No. of shares	50,00,000
EPS	3

$$\text{Calculation of DPS} = 3 \times 0.60 = 1.80$$

$$\text{Calculation of growth} = 0.40 \times 0.15 = 6\%$$

$$\begin{aligned} \text{Price of share (P}_0\text{)} &= \frac{D_1}{K_e - g} \\ &= \frac{1.80}{0.12 - 0.06} = 30 \end{aligned}$$

**QUESTION 6:**

N 18 | N 13 | M 11 | M 05 | SM | RTP

Shares of Voyage Ltd. are being quoted at a price-earnings ratio of 8 times. The company retains ₹ 5 per share which is 50% of its Earning Per Share.

You are required to determine:

- the cost of equity to the company if the market expects a growth rate of 15% p.a.
- the indicative market price with the same cost of capital and if the anticipated growth rate is 16% p.a.
- the market price per share if the company's cost of capital is 20% p.a. and the anticipated growth rate is 18% p.a.

Solution:

1. Retained Earnings	₹ 5 per share
Retention ratio	50%
EPS	₹ 10
DPS	₹ 5
PF Ratio	8 times
Market Price	₹ 10 × 8 times = ₹ 80

$$\begin{aligned}\text{Computation of cost of equity} &= \frac{D_1}{P_0} + g \\ &= \frac{5}{80} + 0.15 \\ &= 21.25\%\end{aligned}$$

$$\begin{aligned}2. \quad \text{Market Price} &= \frac{D_1}{k_e - g} = \frac{5}{0.2125 - 0.16} \\ &= ₹ 95.24\end{aligned}$$

$$\begin{aligned}3. \quad \text{Market Price} &= \frac{D_1}{k_e - g} = \frac{5}{0.20 - 0.18} \\ &= ₹ 250\end{aligned}$$



QUESTION 7:

MTP N 23 | M 18 | N 14

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.

- a. What is the equilibrium price of the equity stock of Platinum Ltd.?
- b. 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?

Solution:

- a. Calculation of cost of equity by using CAPM

$$\begin{aligned}&= R_f + \beta (R_m - R_f) \\ &= 9 + 1.2 (13 - 9) \\ &= 13.8\%\end{aligned}$$

Calculation of equilibrium price

$$\begin{aligned}&= \frac{D_1}{K_e - g} \\ &= \frac{2(1 + 0.07)}{0.138 - 0.07} \\ &= ₹ 31.47\end{aligned}$$

- b. Revised price after the change:

$$\begin{aligned}R_f &= 11\% \\ R_m &= 15\% \\ \text{Growth} &= 10\% \\ \text{Beta} &= 1.3\end{aligned}$$

Calculation of K_e by using CAPM

$$\begin{aligned}&= R_f + \beta (R_m - R_f) \\ &= 11 + 1.3 (15 - 11) \\ &= 16.2\%\end{aligned}$$

Equilibrium price after the change:

$$\begin{aligned}
 &= \frac{D_1}{K_e - g} \\
 &= \frac{2(1 + 0.1)}{0.162 - 0.10} \\
 &= 35.48
 \end{aligned}$$



QUESTION 8:

M 13 | SM | RTP

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:

- The maximum amount Mr. B should pay for shares, if he requires a rate of return of 13% per annum.
- 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.
- 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:

- a) Calculation of Dividends

Year 0	1	2	3	4
Growth	9%	9%	9%	9%
Dividend 14	15.26	16.63	18.13	19.76

The maximum amount Mr. B should pay for share

Year	CF's	PVAF@13%	PV
1	15.26	0.885	13.51
2	16.63	0.783	13.02
3	18.13 + 360 = 378.13	0.693	262.04
Max Amount			288.57

- b. Gordon's formula

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

$$\begin{aligned}
 &= \frac{D_1}{K_e - g} \\
 &= \frac{15.26}{0.13 - 0.09}
 \end{aligned}$$

$$= ₹ 381.5$$

c. Max price paid of the end of 3 year

$$P_3 = \frac{D_3 \times (1 + g)}{k_e - g}$$

$$= \frac{18.13 \times 1.09}{0.13 - 0.09}$$

$$= ₹ 494.04$$



QUESTION 9:

M 21

NM Ltd. (NML) is aspiring to enter the capital market in a three years' time. The Board wants to attain the target price of ₹ 70 for its shares at the end of three years. The present value of its shares is ₹ 52.03. The dividend is expected to grow at a rate of 15% for the next three years. NML uses dividend growth model for its projections. The required rate of return is 15%.

You are required to calculate the amount of dividend to be declared by the board in the base year so as to achieve the target price.

Period (t)	1	2	3
PVIF (15%, t)	0.8696	0.7561	0.6575

Solution:

value of Share = PV of Dividend for 3 years + PV of Target price after 3 years

Let Base Dividend is D_0 , then

$$₹ 52.03 = [D_0 (1 + g) \times PVIF_{(15\%, 1)} + D_0 (1 + g)^2 \times PVIF_{(15\%, 2)} + D_0 (1 + g)^3 \times PVIF_{(15\%, 3)}] + 70.00 \times 0.6575$$

$$₹ 52.03 = [D_0 (1.15) \times 0.8696 + D_0 (1.15)^2 \times 0.7561 + D_0 (1.15)^3 \times 0.6575] + 70.00 \times 0.6575$$

$$D_0 = 2$$

Thus, Company should declare a dividend of ₹ 2 in base year.



QUESTION 10:

MTP M 15

SRK Ltd. is a listed company and it has just announced annual dividend for the year ending 2013-14. Earnings Per Share (EPS) and Dividend Per Share (DPS) for 5 years is as follows:

₹	2013-14	2012-13	2011-12	2010-11	2009-10
EPS	14	13.6	13.1	12.7	12.2
DPS	8.2	8.1	7.9	7.8	7.7

In the opinion of MD of SRK Ltd., if current dividend policy is maintained annual growth in Earnings and Dividends will be no better than the annual growth in earnings over the past years.

Since the Board of SRK Ltd. is reluctant to take debt to finance growth it is considering changing its dividend policy by retaining 50% of its earnings for investment in various projects having a post-tax rate of return of 15%. The beta of SRK Ltd. is 1.5, market risk premium is 4% and Risk Free Rate of Return is 6%.

You are required to calculate expected market price of share, if

a. SRK Ltd. does not announce a change in its Dividend Policy.

b. SRK Ltd. does announce a change in its Dividend Policy by retaining 50% of its earnings.

Note: Growth Rate can be assumed to be remain stable.

Solution:

a) Calculation of cost of equity using CAPM

$$\begin{aligned} K_e &= R_f + \beta (R_m - R_f) \\ &= 6 + 1.5 (4) \\ &= 12\% \end{aligned}$$

$$\text{Average Growth Rate} \left(\frac{14.00}{12.20} \right)^{1/4} - 1 = 3.5\%$$

Calculation of MP by Gordon's formula

$$\begin{aligned} P_0 &= \frac{D_1}{K_e - g} \\ &= \frac{8.2 \times 1.035}{0.12 - 0.035} \\ &= 99.85 \end{aligned}$$

b) Dividend Payout Ratio: = 50%

$$RR = 1 - 0.5 = 50\%$$

$$ROE = 15\%$$

Calculation of growth rate

$$= RR \times ROE$$

$$= 0.50 \times 0.15$$

$$= 7.5\%$$

$$\begin{aligned} D_1 &= 14 \times 1.075 \times 50\% \\ &= 7.525\% \end{aligned}$$

$$\begin{aligned} P_0 &= \frac{D_1}{K_e - g} \\ &= \frac{7.525}{0.12 - 0.075} \\ &= 167.22 \end{aligned}$$



QUESTION 11:

M 12 | RTP N 18

In December, 2011 AB Co.'s share was sold for ₹ 146 per share. A long term earnings growth rate of 7.5% is anticipated. AB Co. is expected to pay dividend of ₹ 3.36 per share.

- What rate of return an investor can expect to earn assuming that dividends are expected to grow along with earnings at 7.5% per
- year in perpetuity?
- It is expected that AB co. will earn about 10% on book Equity and shall retain 60% of earnings. In this case, whether, there would be any change in growth rate and cost of Equity?

Solution:

$$\begin{aligned}
 (a) \quad K_e &= \frac{D_1}{P_0} + g \\
 &= \frac{3.36}{146} + 0.075 \\
 &= 9.80\%
 \end{aligned}$$

$$\begin{aligned}
 (b) \quad \text{Revised growth} &= \text{RR} \times \text{ROE} \\
 &= 60\% \times 0.10 \\
 &= 6\%
 \end{aligned}$$

- Existing $D_1 = ₹ 3.36$

- Existing RR

$$\begin{aligned}
 g &= \text{RR} \times \text{ROE} \\
 7.5\% &= \text{RR} \times 0.10 \\
 \text{RR} &= 75\%
 \end{aligned}$$

- Existing Payout Ratio $= 1 - 0.75 = 25\%$

- Existing $\text{EPS}_1 = \frac{3.36}{25\%} = ₹ 13.44$

- Revised $\text{EPS}_1 = \frac{13.44}{1.075} \times 1.06 = 13.25$

- Revised $D_1 = 13.25 \times (1 - 0.60) = 5.3$

- $$\begin{aligned}
 K_e &= \frac{D_1}{P_0} + g \\
 &= \frac{5.3}{146} + 0.06 = 9.63\%
 \end{aligned}$$



QUESTION 12:

N 18

A Company has an EPS of ₹ 2.50 for the last year and DPS of ₹ 1. The Earnings is expected to grow at 2% a year in long run. Currently it is trading at 7 times its Earnings. If the required rate of return is 14%, compute the following:

- An estimate of the P/E Ratio using Gordon Growth Model,
- The Long-Term Growth Rate implied by the Current P/E Ratio.

Solution:

$$\begin{aligned}
 (a) \quad P_0 &= \frac{D_1}{K_e - g} \\
 &= \frac{1 \times 1.02}{0.14 - 0.02} \\
 &= 8.5
 \end{aligned}$$

$$\text{PE Ratio} = \frac{\text{MP}}{\text{EPS}} = \frac{8.5}{2.50} = 3.4 \text{ times}$$

- (b) PE Ratio (Current) = 7 times
 Price per share = ₹ 2.50 x 7 times
 = ₹ 17.50

We know that

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

$$17.50 = ₹ 1(1+g) / (0.14 - g)$$

$$g = 7.84\%$$



QUESTION 13:

N 22 | M 21 | M 19 | N 12 | N 09 | RTP

Following Financial data are available for PQR Ltd. for the year 2008:

	(₹ in lakh)
8% debentures	125
10% bonds (2007)	50
Equity shares (₹ 10 each)	100
Reserves and Surplus	300
Total Assets	600
Assets Turnovers ratio	1.1
Effective interest rate	8%
Effective tax rate	40%
Operating margin	10%
Dividend payout ratio	16.67%
Current market price of Share	₹ 14
Required rate of return of investors	15%

You are required to:

- Draw income statement for the year
- Calculate its sustainable growth rate of earnings
- Calculate the fair price of the Company's share using dividend discount model, and
- What is your opinion on investment in the company's share at current price?

Solution:

(a) Assets T/O Ratio = $\frac{\text{Sales}}{\text{Total Assets}}$

$$1.1 = \frac{T/O}{600}$$

$$\text{Sales} = 660$$

Since, operation margin is 10%

Therefore, Operating cost is 90%

Income statement

	(₹ Lakhs)
Sales	660

Less: Operating cost (660 × 90%)	(594)
EBIT	66
Less: Interest (125 + 50) × 8%	(14)
EBT	52
Less: Tax @ 40%	(20.8)
EAT	31.2
Less: Dividend @ 16.67%	(5.20)
Retained Earnings	26

(b) $ROE = \frac{EAES}{Eq.SHF} = \frac{31.2}{100+300} = 7.8\%$

Sustainable growth rate = $RR \times ROE$
 $= (1 - 0.1667)$
 $= 0.8333 \times 0.078$
 $= 6.5\%$

(c) Using Gordon's formula

$$D_1 = \frac{5.2 \text{ Lakhs}}{10 \text{ lakhs}} = ₹ 0.52$$

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

$$= \frac{0.52(1.065)}{0.15 - 0.065} = 6.51$$

(d) Current MP = 14, the share is overvalued. Hence investor should not invest in the company.

Self-note: Institute has assumed the given dividend as D_0 .



QUESTION 14:

N 20

AB Industries has Equity Capital of 12 Lakhs, total Debt of 8 Lakhs, and annual sales of 30 Lakhs. Two mutually exclusive proposals are under consideration for the next year. The details of the proposals are as under:

Particulars	Proposal 1	Proposal 2
Target Assets to Sales Ratio	0.65	0.62
Target Net Profit Margin (%)	4	5
Target Debt Equity Ratio (DER)	2:3	4:1
Target Retention Ratio (of earnings) (%)	75	-
Annual Dividend (₹ In Lakhs)	-	0.3
New Equity Raised (₹ In Lakhs)	-	1

You are required to calculate sustainable growth rate for both the proposals.

Solution:

Self-note: Solution given below is not as per suggested answers because the answer over there is logically incorrect. Remember that start point under Proposal 1 is Sales whereas the same under proposal 2 is Equity Capital.

Sustainable growth rate for proposal 1:

$$\text{Total Sales} = 30 \text{ Lakhs}$$

$$\text{Asset to sales Ratio} = \frac{\text{Asset}}{\text{Sales}}$$

$$0.65 = \frac{\text{Assets}}{30 \text{ Lakhs}}$$

$$\text{Assets} = 19.5 \text{ Lakhs}$$

$$\begin{aligned} \text{Net profit margin} &= 30 \text{ lakhs} \times 4\% \\ &= 1.2 \text{ lakhs} \end{aligned}$$

$$\text{Target Debt to Equity} = 2:3$$

$$\text{Total capital} = \text{Total assets} = 19.5 \text{ Lakhs}$$

$$\begin{aligned} \text{Equity portion in total capital} &= 19.5 \text{ Lakhs} \times \frac{3}{2+3} \\ &= 11.7 \text{ Lakhs} \end{aligned}$$

$$\begin{aligned} \text{Return on Equity (ROE)} &= \frac{\text{PAT or EAES}}{\text{ESHF}} \\ &= \frac{1.2}{11.7} = 10.26\% \end{aligned}$$

$$\begin{aligned} \text{Sustainable Growth Rate} &= \text{RR} \times \text{ROE} \\ &= 0.75 \times 10.26\% \\ &= 7.695\% \\ &\sim 7.70\% \end{aligned}$$

Sustainable growth rate for proposal 2:

$$\begin{aligned} \text{Total Equity} &= ₹ 12,00,000 + 1,00,000 \\ &= 13,00,000 \end{aligned}$$

$$\text{Debt equity Ratio} = \frac{\text{Debt}}{\text{Equity}}$$

$$4 = \frac{\text{Debt}}{13,00,000}$$

$$\text{Debt} = 52,00,000$$

$$\begin{aligned} \text{Total capital} &= 13,00,000 + 52,00,000 \\ &= 65,00,000 \end{aligned}$$

$$\text{Total Assets} = 65,00,000$$

$$\text{Assets to Sales} = \frac{\text{Asset}}{\text{sales}}$$