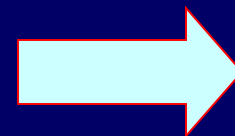# Valuation of Equity Shares

Ram Kumar Kakani
SPJCM Singapore

Stocks and Stock Market

- Equity Shares: Ownership shares in a publicly held corporation

- Secondary Market: Market in which already issued securities are traded by investors

- Dividend: Periodic cash distribution from the firm to the shareholders

- Book Value: Net Worth of the firm according to the balance sheet

Stocks and Stock Market

- Liquidation Value: Net proceeds that would be realized by selling the firm's assets and paying off its creditors

- P/E Ratio: Price per share divided by earnings per share (EPS)

- P/BV Ratio: Price per share divided by book value per share (BV)

Valuing Common Equity Shares

- Expected Return: The percentage yield that an investor forecasts from a specific investment over a set period of time.

- This rate is also known as the <u>opportunity cost of capital</u>

What do you earn when you buy shares?
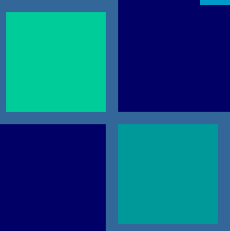- Dividend Yield + Capital Appreciation (??)

Valuing Common Equity Shares

What do you earn when you buy shares?

- Dividend Yield + Capital Appreciation (??)

- Dividend Discount Models

    - 2-year Model

    - Perpetual Growth Model

    - Constant Growth $V = D_i / (k_e - g)$

    - No Growth

    - Growth Phases

Valuation …

- Dividend Discount Model: Computation of today's share price which states that share value equals the present value of all expected future dividends

Dividend Valuation Model

Basic dividend valuation model accounts for the PV of all future dividends.

$$V = \frac{Div_1}{(1 + k_e)^1} + \frac{Div_2}{(1 + k_e)^2} + \dots + \frac{Div_\infty}{(1 + k_e)^\infty}$$

$$= \sum_{t=1}^{\infty} \frac{Div_t}{(1 + k_e)^t}$$

Div_t: Cash dividend at time t

k_e: Equity investor's required return

Adjusted Dividend Valuation Model

The basic dividend valuation model adjusted for the future stock sale.

$$V = \frac{Div_1}{(1 + k_e)^1} + \frac{Div_2}{(1 + k_e)^2} + ... + \frac{Div_n + Price_n}{(1 + k_e)^n}$$

n: The year in which the firm's
            shares are expected to be sold.

Price_n: The expected share price in year n.

Constant Growth Model

The constant growth model assumes that dividends will grow forever at the rate g.

$$V = \frac{D_0(1+g)}{(1 + k_e)^1} + \frac{D_0(1+g)^2}{(1 + k_e)^2} + ... + \frac{D_0(1+g)^\infty}{(1 + k_e)^\infty}$$

$$= \frac{D_1}{(k_e - g)}$$

D_1:   Dividend paid at time 1.

g :   The constant growth rate.

k_e: Investor's required return.

Lets Value ...

Financials Rs (in Crores)				
For the year	Mar.06	Mar. 05	Mar. 04	Mar. 03
Operating Income	2742	2679	2218	1949
Net Profit	203	221	125	89
Net Worth	927	789	686	555
No. of Shares (in crore)	41.62	40.6	40.6	40.6
Adjusted EPS (Rs)	4.1	3.5	2.9	2.2
Book value per Share (Rs)	23.0	20.3	18.1	16.9
Dvdnd per Share (Rs)	1.8	1.8	1.6	1.5
Net Profit Margin (%)	7.4	8.2	5.6	4.6
Current Ratio	1.0	1.1	1.1	1.1
Lt Debt Equity	0.6	1.1	1.4	1.7

Source: Indiabulls.com

Lets Value Chambal Fertilisers …

Financials Rs (in Crores)				
For the year	Mar.06	Mar. 05	Mar. 04	Mar. 03
Operating Income	2742	2679	2218	1949
Net Profit	203	221	125	89
Net Worth	927	789	686	555
No. of Shares (in crore)	41.62	40.6	40.6	40.6
Adjusted EPS (Rs)	4.1	3.5	2.9	2.2
Book value per Share (Rs)	23.0	20.3	18.1	16.9
Dvdnd per Share (Rs)	1.8	1.8	1.6	1.5
Net Profit Margin (%)	7.4	8.2	5.6	4.6
Current Ratio	1.0	1.1	1.1	1.1
Lt Debt Equity	0.6	1.1	1.4	1.7
Current Market Price Per Share	Rs. 30.8			
Current Market Capitalization	Rs. 1,282 Crores			

Constant Growth Model Example

Chambal Fertilisers & Chemicals Limited (CFCL), listed on BSE, has an expected growth rate of 8%. Each common equity share just received an annual Rs. 1.80 dividend per share. The appropriate discount rate is 14%. What is the value of the above shares?

D_1 = Rs. 1.80 (1 + .08)

V_{CF} = D_1 / (k_e - g) = D_1/(.14 - .08)
= Rs. 32.4

Lets Value ...

Financials Rs (in Crores)				
For the year	Mar.06	Mar. 05	Mar. 04	Mar. 03
Operating Income	114	104	111	134
Net Profit	27	24	22	19
Net Worth	23	134	121	105
No. of Shares (in crore)	2.28	2.28	2.28	2.28
Adjusted EPS (Rs)	11.9	10.4	10.3	10.7
Book value per Share (Rs)	84.6	75.2	67.2	58.3
Dvdnd per Share (Rs)	2.25	2.25	2	2
Net Profit Margin (%)	23.3	22.2	18.2	14.2
Current Ratio	15.6	11.7	4.7	4.2
Lt Debt Equity	3.2	3.0	2.9	3.0

Lets Value First Leasing ...

Financials Rs (in Crores)	First Leasing			
For the year	Mar.06	Mar. 05	Mar. 04	Mar. 03
Operating Income	114	104	111	134
Net Profit	27	24	22	19
Net Worth	23	134	121	105
No. of Shares (in crore)	2.28	2.28	2.28	2.28
Adjusted EPS (Rs)	11.9	10.4	10.3	10.7
Book value per Share (Rs)	84.6	75.2	67.2	58.3
Dvdnd per Share (Rs)	2.25	2.25	2	2
Net Profit Margin (%)	23.3	22.2	18.2	14.2
Current Ratio	15.6	11.7	4.7	4.2
Lt Debt Equity	3.2	3.0	2.9	3.0
Return on Equity (%)	14.1	13.8	15.4	18.3
Current Market Price Per Share	Rs. 41			
Current Market Capitalization	Rs. 93.4 Crores			

Growth Phases Model

The growth phases model assumes that dividends for each share will grow at two or more *different* growth rates.

$$V = \sum_{t=1}^{n} \frac{D_0(1+g_1)^t}{(1+k_e)^t} + \sum_{t=n+1}^{\infty} \frac{D_n(1+g_2)^t}{(1+k_e)^t}$$

Growth Phases Model

Note that the second phase of the growth phases model assumes that dividends will grow at a constant rate g_2. We can rewrite the formula as:

$$V = \sum_{t=1}^{n} \frac{D_0(1+g_1)^t}{(1+k_e)^t} + \left[\frac{1}{(1+k_e)^n} \right] \frac{D_{n+1}}{(k_e - g_2)}$$

Lets Value ...

| Financials Rs (in Crores)				
For the year	603	503	403	303
Operating Income	539.94	506.61	532.18	453.9
Net Profit	20.8	15.48	12.97	9.49
Net Worth	16.13	105.98	94.52	84.47
No. of Shares (in crore)	1.96	1.96	1.96	1.96
Adjusted EPS (Rs)	10.61	7.9	6.61	4.87
Book value per Share (Rs)	60.4	54.07	48.23	43.1
Dvdnd per Share (Rs)	2.2	2	1.5	1.31
Net Profit Margin (%)	3.8	3.04	2.42	2.06
Current Ratio	8.66	7.2	11.6	17.38
Lt Debt Equity	2.92	0.28	0.16	0.19

Lets Value Kohinoor Foods ...

Financials Rs (in Crores)	Kohinoor Foods Limited			
For the year	603	503	403	303
Operating Income	539.94	506.61	532.18	453.9
Net Profit	20.8	15.48	12.97	9.49
Net Worth	16.13	105.98	94.52	84.47
No. of Shares (in crore)	1.96	1.96	1.96	1.96
Adjusted EPS (Rs)	10.61	7.9	6.61	4.87
Book value per Share (Rs)	60.4	54.07	48.23	43.1
Dvdnd per Share (Rs)	2.2	2	1.5	1.31
Net Profit Margin (%)	3.8	3.04	2.42	2.06
Current Ratio	8.66	7.2	11.6	17.38
Lt Debt Equity	2.92	0.28	0.16	0.19
Return on Equity (%)	17.6	14.6	13.7	11.3
Current Market Price Per Share	Rs. 67			
Current Market Capitalization	Rs. 132 Crores			

Growth Phases Model Example

Stock Kohinoor Foods has an expected growth rate of 50% for the next 3 years and 6% thereafter. Each share of stock just received an annual Rs. 2.20 dividend per share (on Rs.10 par value). The appropriate discount rate is 14%. What is the value of the common stock under this scenario?
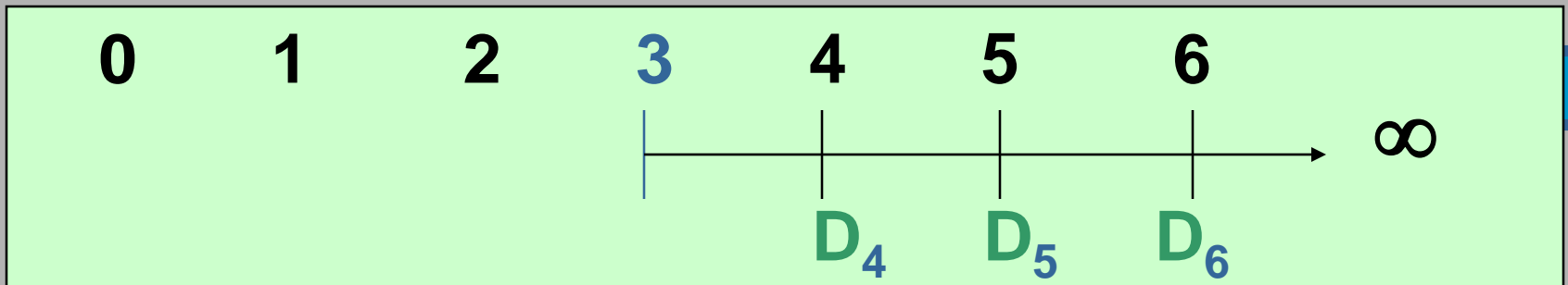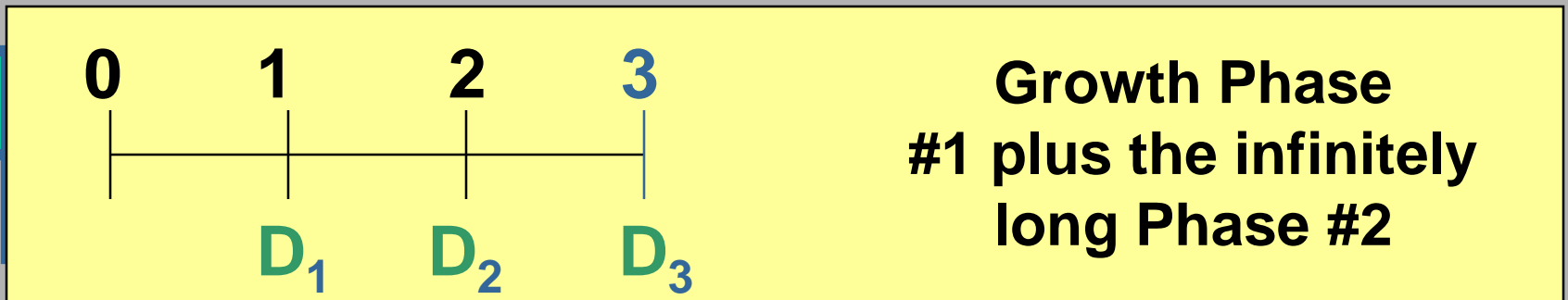
Growth Phases Model Example

0	1	2	3	4	5	6	∞
	D_1	D_2	D_3	D_4	D_5	D_6	

Growth of 50% for 3 years   **Growth of 10% to infinity!**
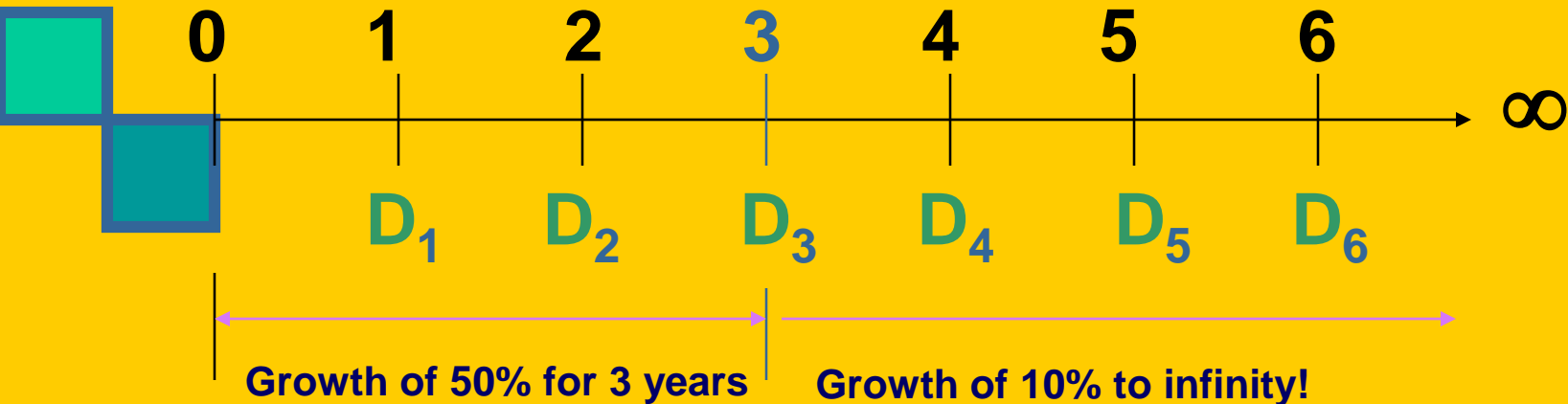
Kohinoor Foods has two phases of growth. The first, 50%, starts at time t=0 and is followed by 6% thereafter starting at time 3. We should view the time line as two separate time lines in the valuation.

2007

Growth Phases Model Example

0   1   2   3   **Growth Phase #1 plus the infinitely long Phase #2**

D_1 D_2 D_3

0   1   2   3   4   5   6 ∞
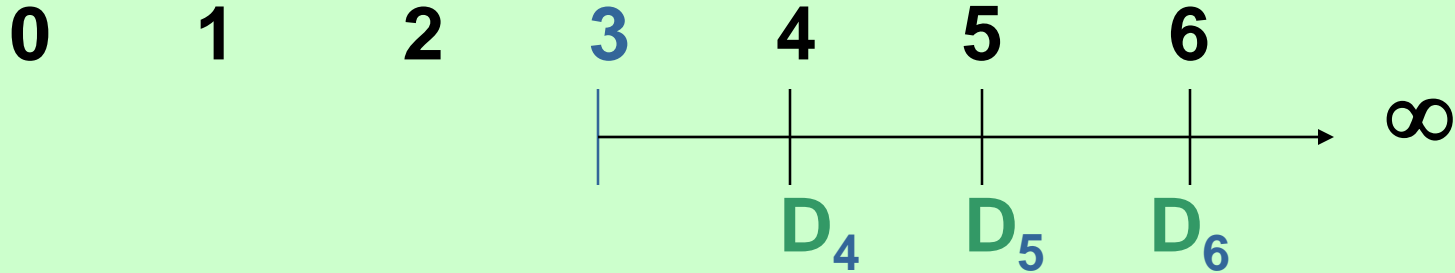
D_4 D_5 D_6

Note that we can value Phase #2 using the *Constant Growth Model*

Growth Phases Model Example

$$V_3 = \frac{D_4}{k-g}$$

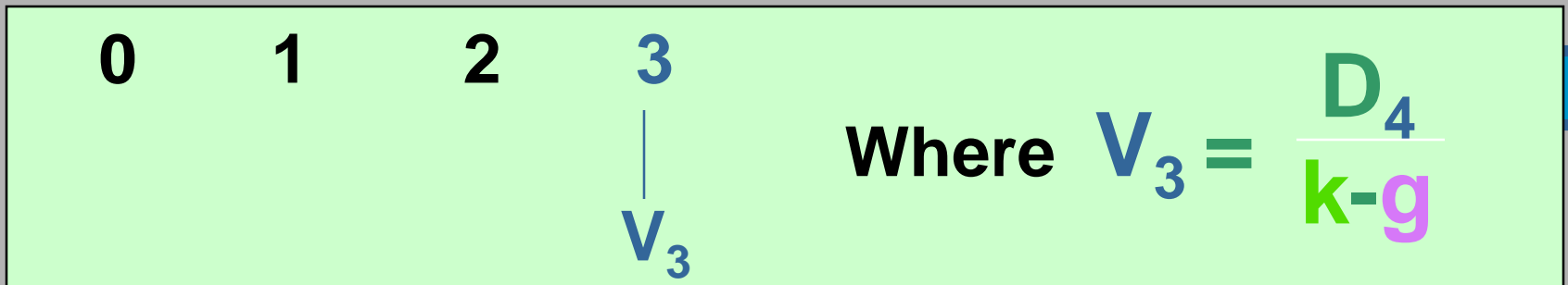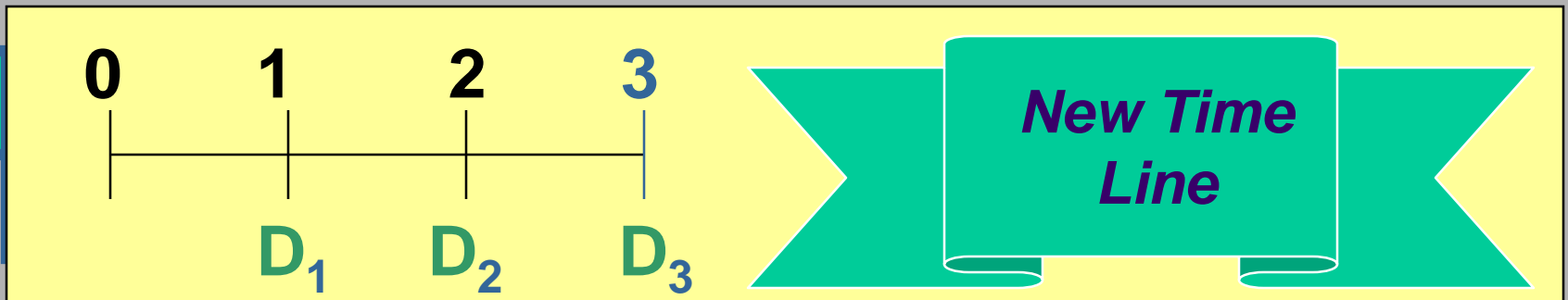We can use this model because dividends grow at a constant 10% rate beginning at the end of Year 3.

0	1	2	3	4	5	6	∞
				D_4	D_5	D_6	

Note that we can now replace __all__ dividends from Year 4 to infinity with the *value* at time t=3, V_3! Simpler!!

Growth Phases Model Example

$$0 \qquad 1 \qquad 2 \qquad 3$$

$$D_1 \qquad D_2 \qquad D_3$$

New Time Line

$$0 \qquad 1 \qquad 2 \qquad 3$$

$$V_3$$

Where $V_3 = \dfrac{D_4}{k-g}$

Now we only need to find the first four dividends to calculate the necessary cash flows.

Growth Phases Model Example

Determine the annual dividends.

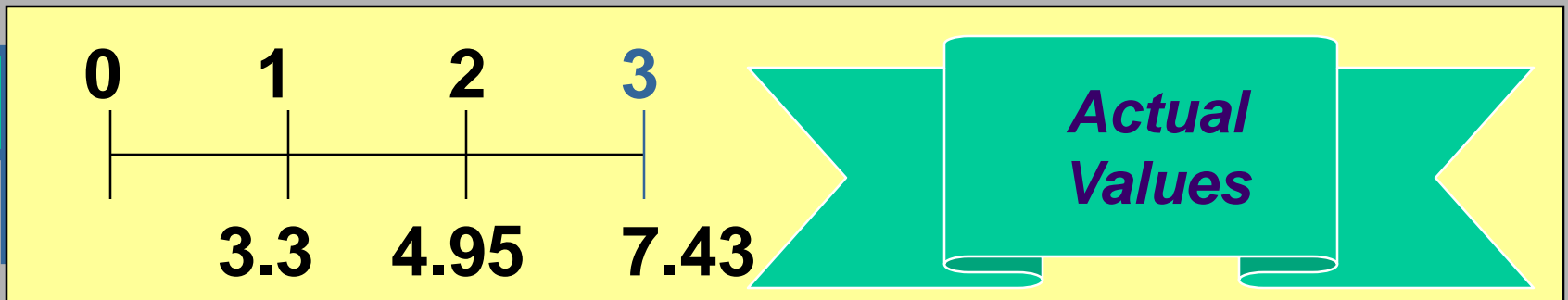D_0 = Rs.2.20 (this has been paid already)

$D_1 = D_0(1+g_1)^1 = Rs.2.20(1.5)^1 = Rs.3.30$

$D_2 = D_0(1+g_1)^2 = Rs.2.20(1.5)^2 = Rs.4.95$

$D_3 = D_0(1+g_1)^3 = Rs.2.20(1.5)^3 = Rs.7.43$

$D_4 = D_3(1+g_2)^1 = Rs.7.43(1.06)^1 = Rs.7.87$

Growth Phases Model Example

0   1   2   3

3.3   4.95   7.43

Actual Values

0   1   2   3

Where   Rs.98.38 $= \dfrac{7.87}{.14 - .06}$

98.38

Now we need to find the present value of the cash flows.

Growth Phases Model Example

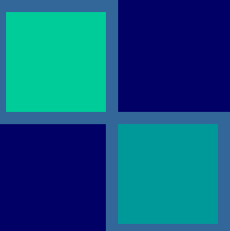Finally, we calculate the *intrinsic value* by summing all the cash flow present values.
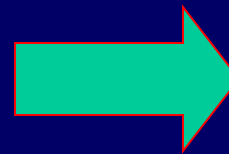
V = Rs. 2.9 + Rs. 3.8 + Rs. 5.0 + Rs. 66.4

V = Rs. 78.1

$$V = \sum_{t=1}^{3} \frac{D_0(1+.50)^t}{(1+.14)^t} + \left[\frac{1}{(1+.14)^n} \right]\left[\frac{D_4}{(.14-.06)} \right]$$
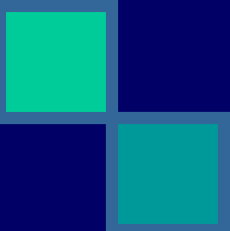
Valuation ...

- <u>Intrinsic value</u> represents the price a security "ought to have" based on all factors bearing on valuation.

- Intrinsic Value vis-à-vis Market Value

Capitalization Rate

- Can be estimated using the perpetuity formula, given minor algebraic manipulation

Determining the Yield on Common Stock

Assume the constant growth model is appropriate. Determine the yield on the common stock.

$$P_0 = D_1 / (k_e - g)$$

Solving for k_e such that

$$k_e = (D_1 / P_0) + g$$

Example

- Eicher Motors is selling for Rs. 25 in the stock market, what might the market be assuming about the growth in dividends?
- It is known that the dividend declared by it in last year was 20%.
- It is given that 20% is the expected return
- Answer: The market is assuming the dividend will grow at 11% per year, indefinitely.

Eicher Motors

For the year	2001	2000	1999	1998
Operating Income	393.0	311.7	239.4	239.3
Net Profit	23.5	15.9	7.8	3.8
Net Worth	82.7	63.5	52.0	47.5
No. of Shares (in crore)	2	2	2	2
Adjusted EPS (Rs)	11.5	7.93	3.62	1.59
Book value per Share (R	41.34	31.75	26.01	23.74
Dvdnd per Share (Rs)	2	2	1.5	1
Net Profit Margin (%)	5.82	5.05	3.01	1.32
Lt Debt Equity	0.42	0.55	0.63	0.6

Source: Indiabulls.com website

Valuation …

- Return Measures
- Dividend Yield = Div_1/P_0
- Return on Equity (ROE) = EPS/BV [a.k.a Return on Net Worth (RONW)]
- What happens if Eicher Motors decides to pay a lower dividend, and reinvest the funds, the stock price may increase because the future dividends may be higher.

Eicher Motors

For the year	2001	2000	1999	1998
Operating Income	393.0	311.7	239.4	239.3
Net Profit	23.5	15.9	7.8	3.8
Net Worth	82.7	63.5	52.0	47.5
No. of Shares (in crore)	2	2	2	2
Adjusted EPS (Rs)	11.5	7.93	3.62	1.59
Book value per Share (R	41.34	31.75	26.01	23.74
Dvdnd per Share (Rs)	2	2	1.5	1
Net Profit Margin (%)	5.82	5.05	3.01	1.32
Lt Debt Equity	0.42	0.55	0.63	0.6
Return on Equity (%)	27.8	25.0	13.9	6.7

First Leasing

Financials Rs (in Crores)	First Leasing			
For the year	Mar.06	Mar. 05	Mar. 04	Mar. 03
Operating Income	114	104	111	134
Net Profit	27	24	22	19
Net Worth	23	134	121	105
No. of Shares (in crore)	2.28	2.28	2.28	2.28
Adjusted EPS (Rs)	11.9	10.4	10.3	10.7
Book value per Share (Rs)	84.6	75.2	67.2	58.3
Dvdnd per Share (Rs)	2.25	2.25	2	2
Net Profit Margin (%)	23.3	22.2	18.2	14.2
Current Ratio	15.6	11.7	4.7	4.2
Lt Debt Equity	3.2	3.0	2.9	3.0
Return on Equity (%)	14.1	13.8	15.4	18.3

Kohinoor Foods

Financials Rs (in Crores)	Kohinoor Foods Limited			
For the year	603	503	403	303
Operating Income	539.94	506.61	532.18	453.9
Net Profit	20.8	15.48	12.97	9.49
Net Worth	16.13	105.98	94.52	84.47
No. of Shares (in crore)	1.96	1.96	1.96	1.96
Adjusted EPS (Rs)	10.61	7.9	6.61	4.87
Book value per Share (Rs)	60.4	54.07	48.23	43.1
Dvdnd per Share (Rs)	2.2	2	1.5	1.31
Net Profit Margin (%)	3.8	3.04	2.42	2.06
Current Ratio	8.66	7.2	11.6	17.38
Lt Debt Equity	2.92	0.28	0.16	0.19
Return on Equity (%)	17.6	14.6	13.7	11.3

Stock price and EPS link

- Payout ratio: Fraction of earnings paid out as dividends
- Ploughback ratio: Fraction of earnings retained by the firm
- Growth can be derived from applying the return on equity to the percentage of earnings ploughed back into operations.
- $P_0 = E_1(1 - b)/(k_e - ROE \times b)$

Stock price and EPS link

- So, justified price-earnings ratio becomes $P_0/E_1 = (1 - b)/(k_e - ROE \times b)$
- P/E Ratio and Ploughback Ratio
  - If, $ROE > k_e$ then ⬆ in b leads to ⬆ in P/E
  - If, $ROE < k_e$ then ⬆ in b leads to ⬇ in P/E
- P/E Ratio and Interest Rate
- P/E Ratio and Risk
- P/E Ratio and Liquidity