Different Approaches to Valuation

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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)
- Market Value Balance Sheet: Financial statement that uses market value of assets and liabilities

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 opportunity cost of capital

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 $V = D_1/(k_e - g)$
  - 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
- It is the oldest discounted cash flow model in practice

Dividend Valuation Model

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

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

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

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.

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

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.

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

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

D_1:	**Dividend paid at time 1.**
g :	**The constant growth rate.**
k_e:	**Investor's required return.**

Lets Value Chambal Fertilisers ...

Financials Rs (in Crores)	Chambal Fertilisers and Chemicals Limited				
For the year	703	603	503	403	303
Operating Income	2597	2743	2679	2218	1949
Net Profit	151	203	221	125	89
Net Worth	956	927	789	686	555
No. of Shares (in crore)	41.6	41.6	40.6	40.6	40.6
Adjusted EPS (Rs)	3.3	4.1	3.5	2.9	2.2
Book value per Share (Rs)	24.5	23.0	20.3	18.1	16.9
Dvdnd per Share (Rs)	1.8	1.8	1.8	1.6	1.5
Net Profit Margin (%)	5.8	7.4	8.2	5.6	4.6
Current Ratio	1.8	1.0	1.1	1.1	1.1
Lt Debt Equity	1.2	0.6	1.1	1.4	1.7
Return on Equity (%)	13.3	17.8	17.2	15.9	13.0
Current Market Price Per Share		Rs. 52.6			
Current Market Capitalization		Rs. 2,189 Crores			
Source: www.Indiabulls.com (on 14-11-2007)					

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 12%. What is the value of the above shares?

D_1 = Rs. 1.80 (1 + .08)

V_{CF} = D_1 / (k_e - g) = D_1/(.12 - .08)

= Rs. 48.6

Lets Value First Leasing ..

Financials Rs (in Crores)	First Leasing Company of India				
For the year	Mar.07	Mar.06	Mar. 05	Mar. 04	Mar. 03
Operating Income	130	114	104	111	134
Net Profit	25	27	24	22	19
Net Worth	123	151	134	121	105
No. of Shares (in crore)	2.3	2.3	2.3	2.3	2.3
Adjusted EPS (Rs)	11.1	11.9	10.4	10.3	10.7
Book value per Share (Rs)	69.4	84.6	75.2	67.2	58.3
Dvdnd per Share (Rs)	2.3	2.3	2.3	2.0	2.0
Net Profit Margin (%)	19.4	23.3	22.2	18.2	14.2
Current Ratio	7.8	15.6	11.7	4.7	4.2
Lt Debt Equity	4.4	3.2	3.0	2.9	3.0
Return on Equity (%)	16.0	14.1	13.8	15.4	18.3
Current Market Price Per Share		Rs. 47.2			
Current Market Capitalization		Rs. 107.4 Crores			
Source: www.Indiabulls.com (on 14-11-2007)					

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:

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

Lets Value Satyam Comp ...

Financials Rs (in Crores)	Satyam Computers				
For the year	703	603	503	403	303
Operating Income	6228	4634	3464	2542	2024
Net Profit	1423	1240	750	556	307
Net Worth	5765	4333	3216	2580	2134
No. of Shares (in crore)	66.7	32.4	31.9	31.6	31.5
Adjusted EPS (Rs)	21.1	30.2	24.1	18.0	14.8
Book value per Share (Rs)	86.7	133.6	100.8	81.6	67.9
Dvdnd per Share (Rs)	3.5	7.0	5.0	4.0	3.0
Net Profit Margin (%)	22.2	26.1	21.0	21.1	14.9
Current Ratio	5.9	6.3	7.3	7.3	5.6
Lt Debt Equity	0.0	0.0	0.0	0.0	0.0
Return on Equity (%)	24.4	22.6	24.0	22.1	21.8
Current Market Price Per Share		Rs. 411			
Current Market Capitalization		Rs. 27,491 Crores			
Source: www.Indiabulls.com (on 14-11-2007)					

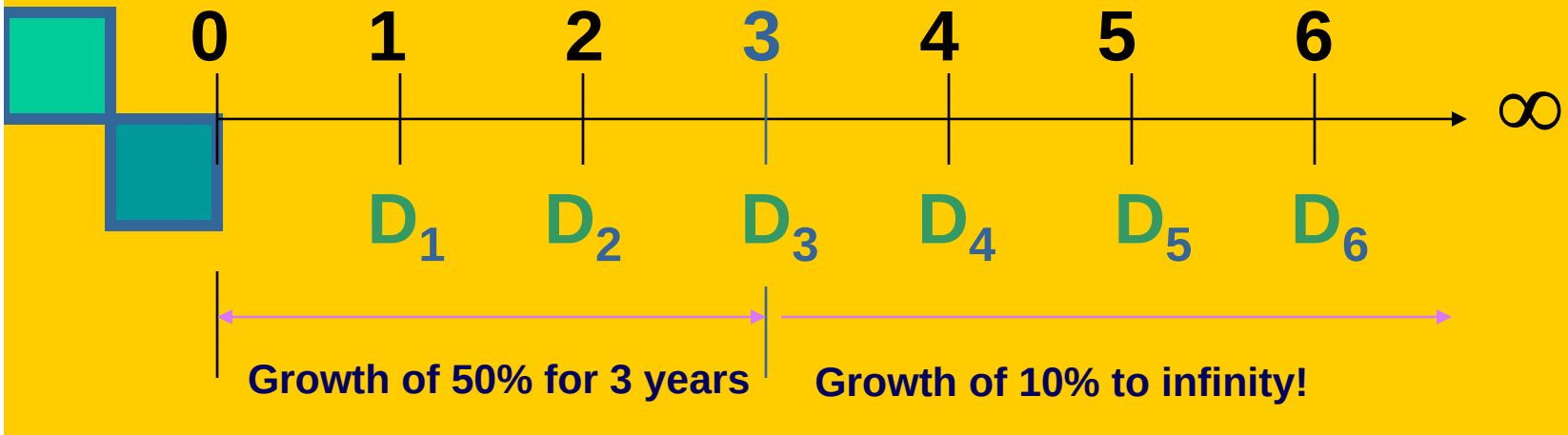
Lets Value Kohinoor Foods ...

Financials Rs (in Crores)	Kohinoor Foods				
For the year	703	603	503	403	303
Operating Income	589	540	507	532	453.9
Net Profit	22	21	15	13	9.49
Net Worth	139	118	106	95	84.47
No. of Shares (in crore)	2.0	2.0	2.0	2.0	1.96
Adjusted EPS (Rs)	11.3	10.5	7.9	6.6	4.87
Book value per Share (Rs)	70.7	60.4	54.1	48.2	43.1
Dvdnd per Share (Rs)	1.0	2.2	2.0	1.5	1.31
Net Profit Margin (%)	3.7	3.8	3.0	2.4	2.06
Current Ratio	8.0	8.7	7.2	11.6	17.38
Lt Debt Equity	1.4	0.8	0.3	0.2	0.19
Return on Equity (%)	15.9	17.5	14.6	13.7	11.3
Current Market Price Per Share		Rs. 51.1			
Current Market Capitalization		Rs. 100.3 Crores			
Source: www.Indiabulls.com (on 14-11-2007)					

Growth Phases Model Example

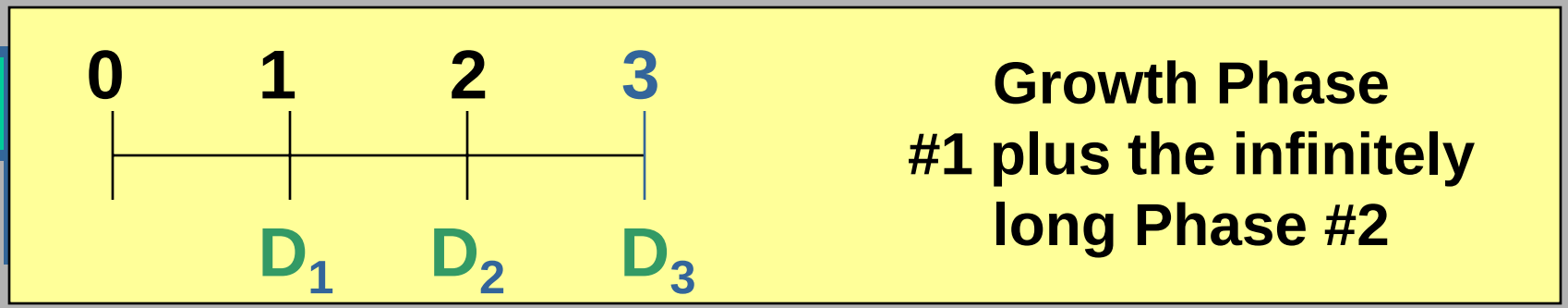
Stock Kohinoor Foods has an expected growth rate of 50% for the next 3 years and 7% thereafter. Each share of stock just received an annual Rs. 1.00 dividend per share (on Rs.10 par value). The appropriate discount rate is 12%. What is the value of the common stock under this scenario?

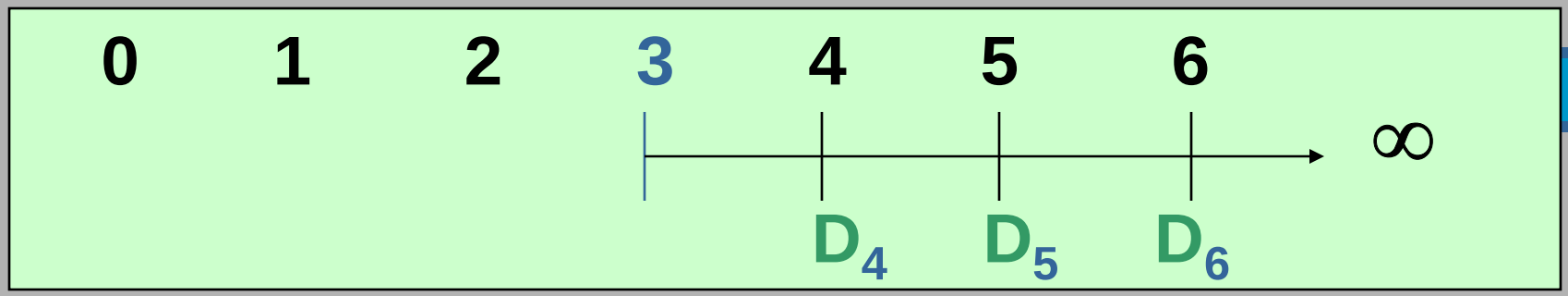
Growth Phases Model Example



Kohinoor Foods has two phases of growth. The first, 50%, starts at time t=0 and is followed by 7% thereafter starting at time 3. We should view the time line as two separate time lines in the valuation.

Growth Phases Model Example



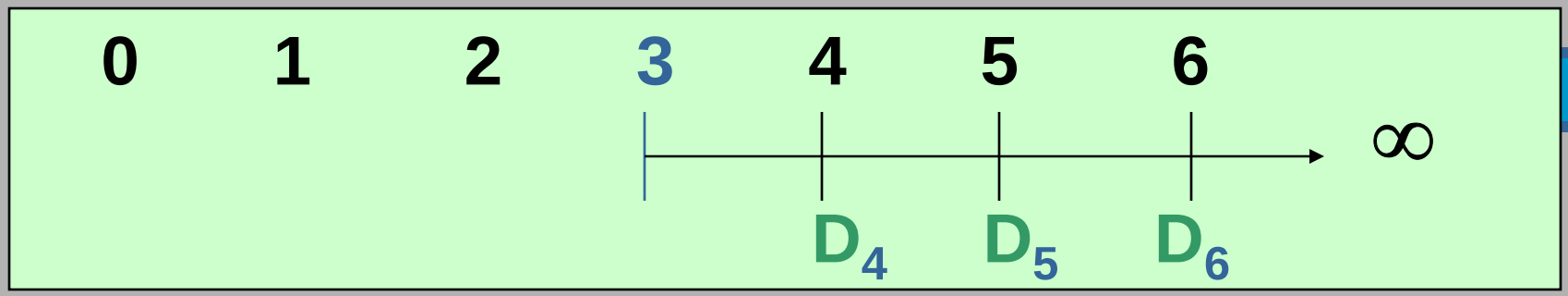


Note that we can value Phase #2 using the *Constant Growth Model*

Growth Phases Model Example

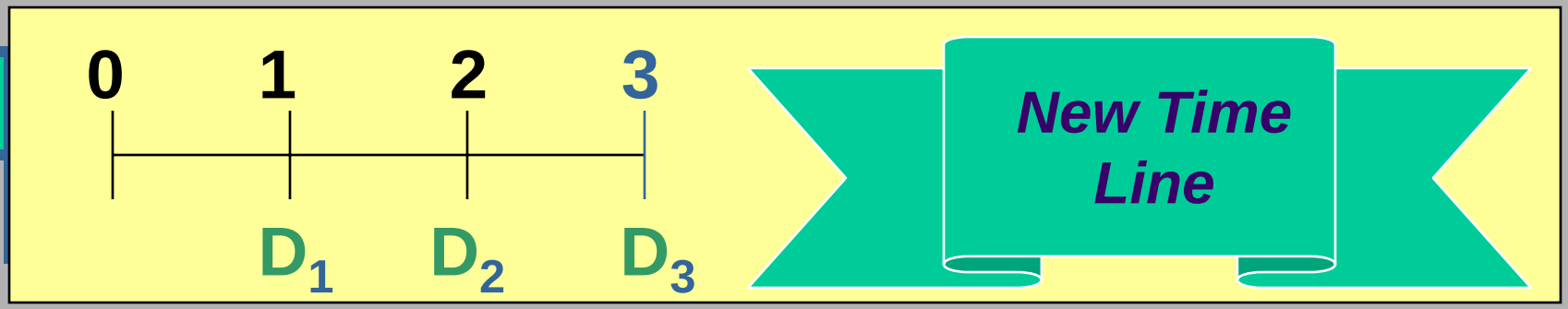
$$V_3 = \frac{D_4}{k-g}$$

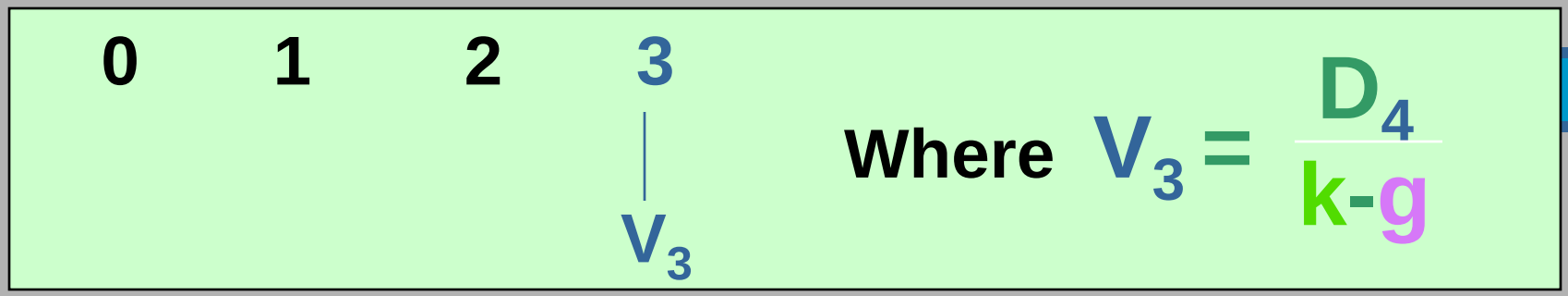
We can use this model because dividends grow at a constant 7% rate beginning at the end of Year 3.



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

Growth Phases Model Example





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.1.00 (this has been paid already)

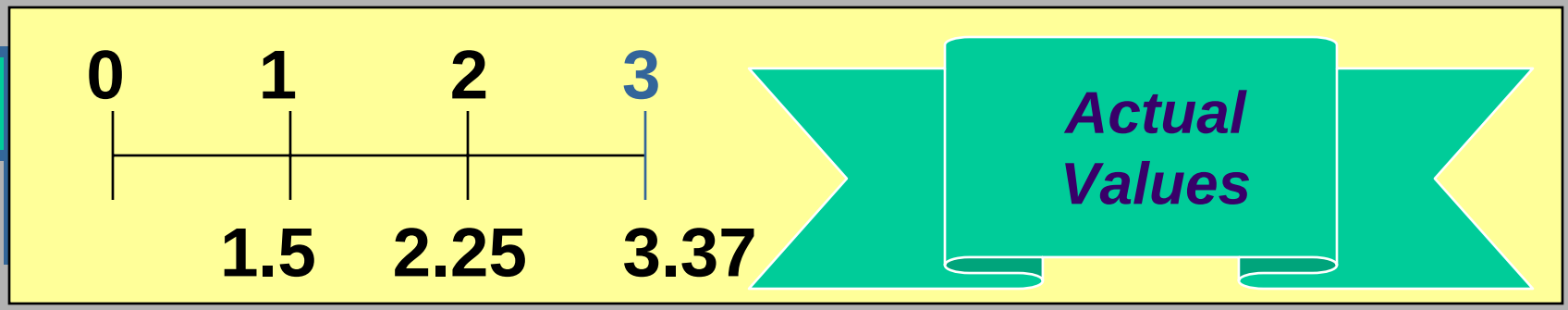
$D_1 = D_0(1+g_1)^1 = Rs.1.00(1.5)^1 = Rs.1.50$

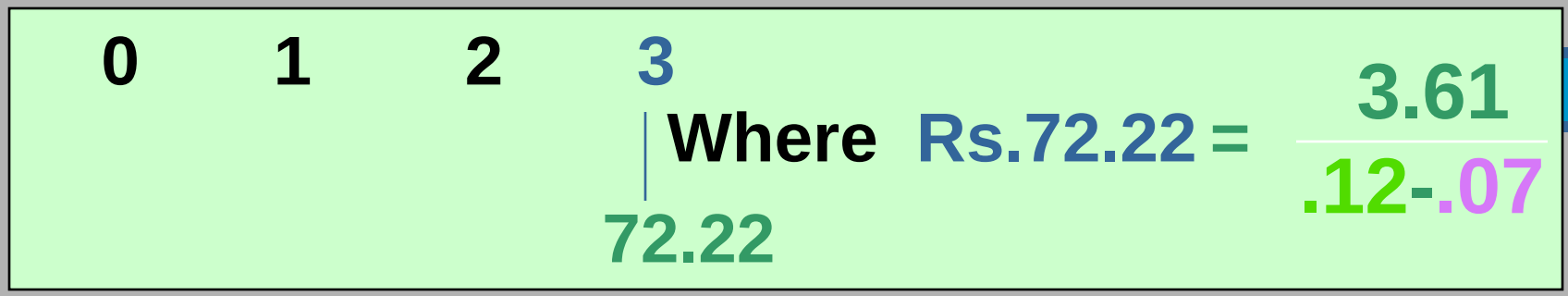
$D_2 = D_0(1+g_1)^2 = Rs.1.00(1.5)^2 = Rs.2.25$

$D_3 = D_0(1+g_1)^3 = Rs.1.00(1.5)^3 = Rs.3.37$

$D_4 = D_3(1+g_2)^1 = Rs.3.37(1.07)^1 = Rs.3.61$

Growth Phases Model Example





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.

$$V = \text{Rs. } 1.3 + \text{Rs. } 1.8 + \text{Rs. } 2.4 + \text{Rs. } 51.4$$

$$V = \text{Rs. } 56.9$$

$$V = \sum_{t=1}^{3} \frac{D_0(1+.50)^t}{(1+.12)^t} + \left[\frac{1}{(1+.12)^n}\right]\left[\frac{D_4}{(.14-.07)}\right]$$

Valuation ...

- Intrinsic value 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

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

Different Approaches Continues ...

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Valuation ...

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

Suppose, a Co-operative Sugar Unit in Uttar Pradesh is up for sale/divestment ... how do you value it?

- Book Value Model: Net worth of a firm according to the balance sheet
- Liquidation Model: Net proceeds that would be realized by selling the firm's assets and paying off its creditors

Valuation …

- Market Value Balance Sheet: Financial statement that uses market value of assets and liabilities
- Price Earnings Ratio Model

But, firms are more valuable as going concerns (??) and their ability to generate future cash flows. Market values are more relevant for finance.

- Discounted Cash Flow Model

Example

- Kilburn Chemicals is selling for Rs. 50 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 15% is the expected return
- Answer: The market is assuming the dividend will grow at 10.6% per year, indefinitely.

Financials Rs (in Crores)	Kilburn Chemicals			
For the year	703	603	503	403
Operating Income	72	63	54	45.86
Net Profit	7	8	3	2.24
Net Worth	32	27	21	19.38
No. of Shares (in crore)	0.7	0.7	0.7	0.74
Adjusted EPS (Rs)	8.7	10.8	4.2	2.47
Book value per Share (Rs)	43.2	36.8	28.4	26.37
Dvdnd per Share (Rs)	2.0	2.0	1.8	1.5
Net Profit Margin (%)	9.7	13.4	6.4	4.88
Current Ratio	2.4	3.1	3.3	3.59
Lt Debt Equity	0.8	0.9	0.7	0.97

Source: www.Indiabulls.com (on 14-11-2007)

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 Kilburn Chemicals decides to pay a lower dividend, and reinvest the funds, the stock price may increase because the future dividends may be higher.

Financials Rs (in Crores)	Kilburn Chemicals			
For the year	703	603	503	403
Operating Income	72	63	54	45.86
Net Profit	7	8	3	2.24
Net Worth	32	27	21	19.38
No. of Shares (in crore)	0.7	0.7	0.7	0.74
Adjusted EPS (Rs)	8.7	10.8	4.2	2.47
Book value per Share (Rs)	43.2	36.8	28.4	26.37
Dvdnd per Share (Rs)	2.0	2.0	1.8	1.5
Net Profit Margin (%)	9.7	13.4	6.4	4.88
Current Ratio	2.4	3.1	3.3	3.59
Lt Debt Equity	0.8	0.9	0.7	0.97
Return on Equity (%)	20.1	29.3	14.7	9.4

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

Example

- Supreme Petrochemicals Ltd. (SPL) forecasts to pay a Rs. 5.00 dividend next year, which represents 100% of its earnings. This will provide investors with a 12% expected return. Instead, Saket suggests to blow back 40% of the earnings at the firm's current return on equity of 20%. What is the value of the stock before and after the ploughback decision.

Example … Continued

- Answer: If the company did not ploughback some earnings, the stock price would remain at Rs. 41.67. With the ploughback, the price rises to Rs. 75.00
- The difference between these two numbers (75.00 – 41.67 = 33.33) is called the Present Value of Growth Opportunities (PVGO)

Share Price ...

- In other words, PVGO is Net Present Value (NPV) of a firm's future investments
- Sustainable Growth Rate: Steady rate at which a firm can grow (= ROE × ploughback ratio)
- Share price = present value of level stream of earnings + present value of growth opportunities

FCF and PV

- Free Cash Flows (FCF) should be the theoretical basis for all PV calculations
- FCF is a more accurate measurement of PV than either Div or EPS
- The market price does not always reflect the PV of FCF
- When valuing a business for purchase, always use FCF

Valuing a business

- The value of a business is usually computed as the discounted value of FCF out to a *valuation horizon* (H)
- The *valuation horizon* is sometimes called the terminal value and is calculated like PVGO.

Book Value

- An accounting measure and can be established easily

But,

- Accounting conventions and policies are subject to a lot of subjectivity and arbitrariness
- Also, historical figures are quite divergent from current economic value/earnings power

Liquidation Value

- Though it is more realistic than book value

But,

- It is difficult to estimate the amounts to be realized from the liquidation of various assets
- It also does not reflect earnings capacity of the business

List of Sugar Mills in U.P.

Bajaj Hindustan	New Swadeshi Sugar Mills
Balrampur Chini Mills	Oswal Overseas
Basti Sugar Mills	Oudh Sugar Mills
Birla Sugar Mills	Pratappur Sugar & Ind..
Chilwaria Sugars	Ramalal Sahakari Chini Mills
Daya Sugar	Rosa Sugar Works.
Dwarikesh Sugar Industry	Saraya Sugar Mills
Govind Nagar Sugar Mills	Seksaria Biswan Sugar Factory
H.M.P.Sugar Ltd	Shravasti Kisan Sahakari Chini Mills
ISGEC	Simbhaoli Sugar Mills
J.K.Sugar	The Bharat Sugar Mills
K.M.Sugar Mills	The Saraswati Sugar Mills
Kasturi Sugar Mills	The United Provinces Sugar Chemic
Kisan Sahakari Chini Mills	Titawi Sugar Complex.
Mahalakshmi Sugar Mills	Tulsipur Sugar Co.
Mawana Sugar Mills	U.P.State Sugar Corporation
Motilal Padampat Udyog	Upper Doab Sugar Mills
New India Sugar Mills	Upper Ganges Sugar Ind.

Available Data of Similar Sugar Mills

14/11/2007	Price	BV	P/BV	EPS	P/EPS
Upper Ganges Sugar	78	144	0.5	41.0	1.9
Dwarikesh Sugar	58	97	0.6	13.4	4.3
Riga Sugar	25	51	0.5	15.0	1.7
K M Sugar	21	36	0.6	6.7	3.1
Rana Sugar	17	26	0.6	3.8	4.3
Mawana Sugar	28	57	0.5	2.5	11.2
			0.56		4.43

Valuation of Sugar Mill										
Year	1	2	3	4	5	6	7	8	9	10
Capex	10	5	1	1	1	1	1	1	1	1
Depreciat	2	2	2	2	2	2	2	2	2	2
PAT	-4	-2	2	4	8	10	11	12	13	14
FCF	-12	-5	3	5	9	11	12	13	14	15
Terminal Value										70
FCF incl.	-12	-5	3	5	9	11	12	13	14	85