DISCOUNTED CASH FLOW VALUATION

DIFFERENT ASPECTS OF VALUATION OF EQUITY SHARES USING DCF METHOD

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DISCOUNTED CASH FLOW

DISCOUNTED CASH FLOW (DCF)

- Values a business based on the expected cash flows over a given period of time
- Considers Cash Flow and Not Accounting Profits
- Value of business is aggregate of discounted value of cash flows for the explicit period and perpetuity
- Involves determination of
  - Discount Factor - Weighted Average Cost of Capital ('WACC')
  - Growth rate for perpetuity

DCF - PARAMETERS

Cash Flows

- Projections
- FCF to Firm or FCF to Equity
- Horizon (Explicit) period
- Growth rate for perpetuity

Discounting Rate

- Cost of Equity
- Cost of Debt
- Debt Equity ratio

FCFE V/S FCFF

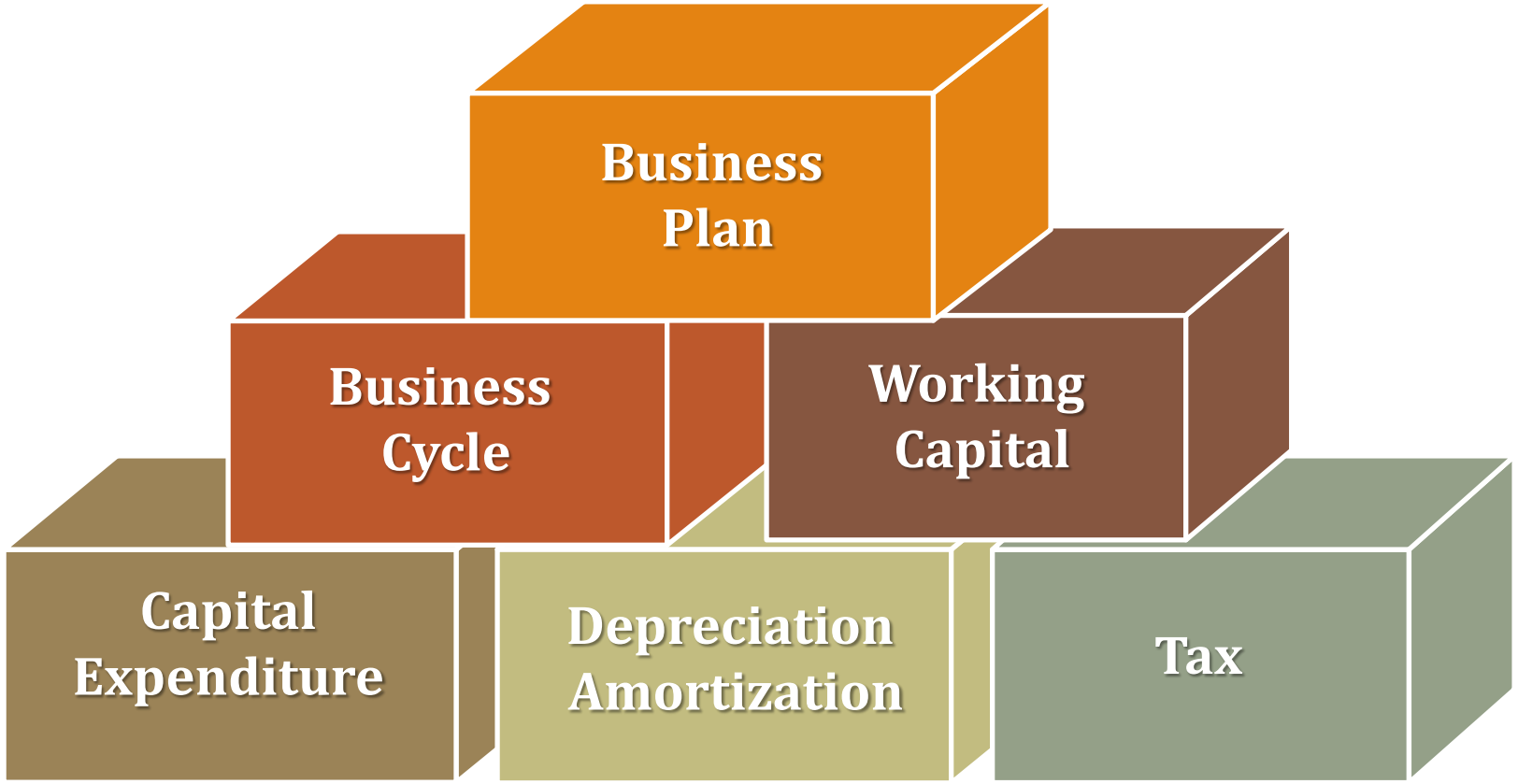
Free Cash Flow to Equity

- Discount cash flows to equity
- Cash flows after considering all expenses, tax, *interest* and *debt additions/re-payments*
- Discount rate: Cost of Equity

Free Cash Flow to Firm

- Discount cash flows to firm
- Cash flows after considering all expenses and taxes, but prior to interest and debt additions/re-payments
- Discount rate: WACC

CASH FLOWS


Business Plan
Business Cycle
Working Capital
Capital Expenditure
Depreciation Amortization
Tax

CASH FLOWS

- Gross operational cash flows (EBIDTA)
- Less: Tax
- Less: Working capital requirements
- Less: Capex requirements

Enterprise Value

- Less: Interest payment & additions/ repayment for loans

Equity Value

FCFF

FCFE

DCF - PROJECTIONS

- Factors to be considered for reviewing projections:
  - Appraisal by institutions and understanding of the Business
  - Existing policy/ legal framework
  - Industry/Company Analysis
  - Dependence on single customer/ supplier
  - Installed capacity
  - Capital expenditure – increasing capacities
  - Working capital requirements
  - Alternate scenarios / sensitivities

DCF – HORIZON PERIOD

- Horizon period and Residual value
- Horizon period at least for about 3-5 years
- For cyclical businesses – cover at least one full business cycle
- Basic criteria – achieve stage of stable growth
  - If industry is passing through rough phase – horizon period should cover a period till rationalization is reached

DCF – GROWTH RATE

- Growth rate during horizon period:
  - Historical data
  - Competitors' growth rate
  - Macro economic factors (GDP growth rate, inflation, etc.)
  - Can also be derived as Reinvestment rate X Return on Invested Capital ('ROIC')
- Perpetuity growth rate:
  - Ideally should not be more than the expected economic growth rate
- Growth rate should consider the inflation rate

DISCOUNTING FACTOR

Weighted Average Cost of Capital (WACC) determination – Some Key Issues

- **Cost of Equity**
  - Risk Free rate of Return
  - Market Risk Premium
  - Beta (β)
- **Cost of Debt – Weighted average**
- **Tax rate based on projections of discrete period**
- **Debt : Equity ratio**

DISCOUNTING FACTOR

Weighted Average Cost of Capital (WACC) =

$$\left\{ \frac{D}{(D + E)} \times Kd \right\} + \left\{ \frac{E}{(D + E)} \times Ke \right\}$$

D = Debt

E = Equity

Kd = Post tax cost of debt

Ke = Cost of equity

COST OF EQUITY

- In CAPM Method, all the market risk is captured in the beta, measured relative to a market portfolio, which atleast in theory should include all traded assets in the market place held in proportion to their market value

$$Ke = (Rf + (\beta \times Erp))$$

Where,

Ke = Cost of Equity

Rf = Risk free return

Erp = Equity risk premium

β = Beta

RISK FREE RATE AND EQUITY RISK PREMIUM

Risk Free Rate

- Expected rate of return on a risk free asset
- For an investment return to be risk free, two conditions have to be met:
  a) No default risk
  b) No uncertainty about reinvestment rates

For e.g. Government Securities

Equity Risk Premium

- It measures the extra return that would be demanded by investors for shifting their money from a riskless investment to a risk bearing investment
- There are 2 ways of estimating risk premium in CAPM
  a) Large investors can be surveyed about their expectations for the future
  b) The actual premiums earned over a past period can be obtained from historical data

BETA

- Beta: A measure of the volatility, or systematic risk, of a security or a portfolio in comparison to the market as a whole
- In CAPM, the beta of the asset has to be estimated relative to the market portfolio
- There are 3 approaches available for estimating these parameters:
  a) Historic Market Beta
  b) Fundamental Beta
  c) Accounting Beta

BETA

Historical Market Beta

- This is the conventional approach for estimating beta
- Beta of an asset = Covariance of asset with market portfolio / Variance of the market Portfolio (Regression analysis)

Fundamental Beta

- The beta for a firm may be estimated from a regression but it is determined by fundamental decisions that the firm has made on

a) What business to be in?
b) How much operating leverage to use in business?
c) The degree to which the firm uses financial leverage

Accounting Beta

- It estimates the market risk parameters from accounting earnings rather than from traded prices
- Thus, changes in earnings of a division or a firm, on a quarterly or an annual basis, can be regressed against changes in earnings for the market, in the same periods, to arrive at an estimate of a market beta to use in the CAPM

UNLEVERED BETA

- A type of metric that compares the risk of an unlevered Company to the risk of the market. The unlevered beta is the beta of a company without any debt
- Unlevering a beta removes the financial effects from leverage
- The formula to calculate a company's unlevered beta is:

$$B_{U=} \frac{BL}{[1+(1-Tc) \times (D/E)]}$$

Where:
BL is the firm's beta with leverage.
Tc is the corporate tax rate.
D/E is the company's debt/equity ratio

ILLUSTRATION

Calculation of Relevered Beta of Comparable Companies of Co. X Ltd.

(INR crores)

Name of Company	Reported Beta	Market Value of Debt	Market Equity	D/E Ratio (A/B)	Effective Tax Rate	Unlevered Beta
	A	B	C	B/C	D	A/[1+(1-D)*(B/C)]
Co. P Ltd.	0.72	1,100.00	5,500.00	0.20	34.61%	0.64
Co. Q Ltd.	0.88	400.00	1,400.00	0.29	34.61%	0.78
Co. R Ltd.	0.49	-	500.00	-	34.61%	0.49
Average Reported Beta	**0.70**				**Average Unlevered Beta**	**0.64**

Relevered Beta	Co. X Ltd.
Unlevered Beta	0.64
Debt	0.25
Equity	0.75
Debt / Equity Ratio	0.33
Tax Rate	34.61%
Relevered Beta	**0.77**

Relevered Beta = Unlevered Beta X 1+(1-Tax Rate) X Debt/Equity Ratio

COST OF DEBT

- The cost of debt is the rate at which a firm can borrow money today and will depend on the default risk embedded in the firm
  - Default risk can be measured using a bond rating or by looking at financial ratios
- Possible sources of information:
  - Cost of debt currently incurred
  - Current market cost of borrowing incurred by comparable companies that have similar credit worthiness

ILLUSTRATION FOR CALCULATION OF WACC

XYZ COMPANY LIMITED

DISCOUNTED CASH FLOW METHOD

CALCULATION OF COST OF EQUITY

Cost of Equity			
	Risk Free Return	**Beta**	**Equity Risk Premium**
	7.00%	0.77	9.00%
Cost of Equity	**13.93%**		

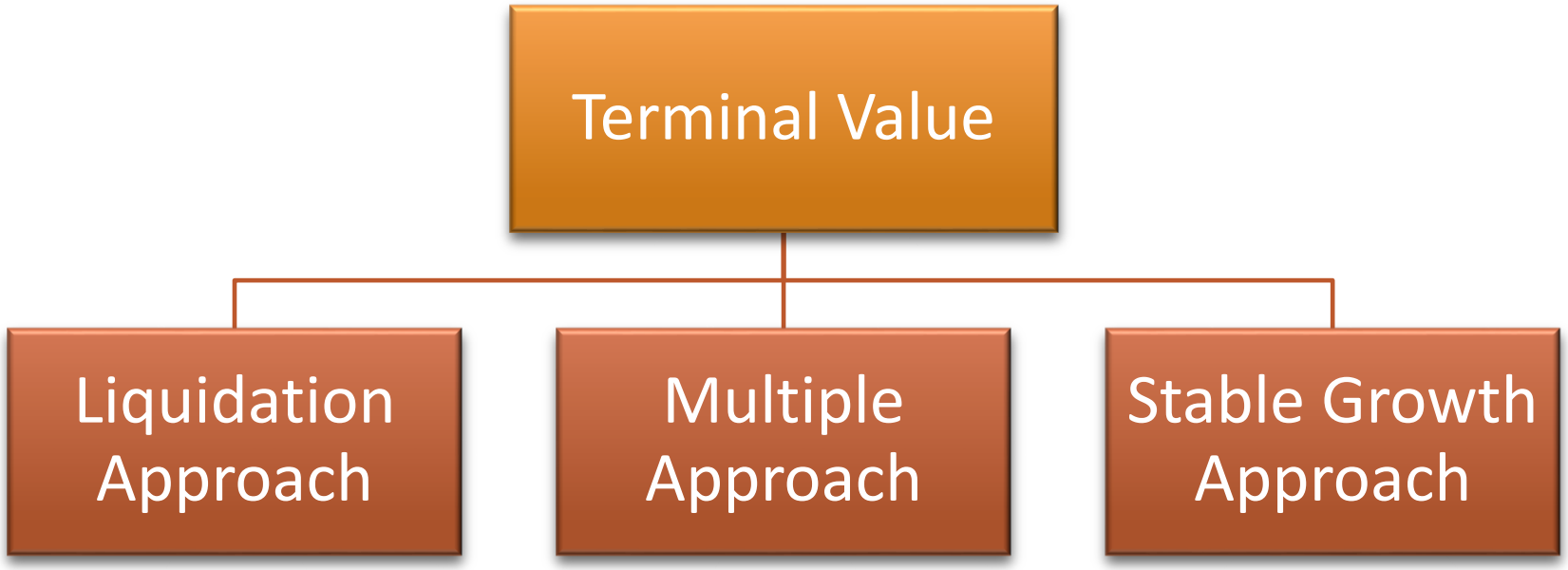
Cost of Debt		
	Interest Rate	**Tax**
	12.00%	34.61%
Cost of Debt	**7.85%**	

Debt - Equity		
	Debt	**Equity**
	1	4

WACC	**12.71%**

TERMINAL VALUE

- Terminal Value is the residual value of business at the end of projection period used in discounted cash flow method



TERMINAL VALUE

Liquidation Approach

- It is assumed that the firm will cease operations at a point of time in future and sell the assets it has accumulated

- Value based on book value
- Value based on earning power of asset

Multiple Approach

- The value of firm in a future year is estimated by applying a multiple to the firm's earning or revenue in that year

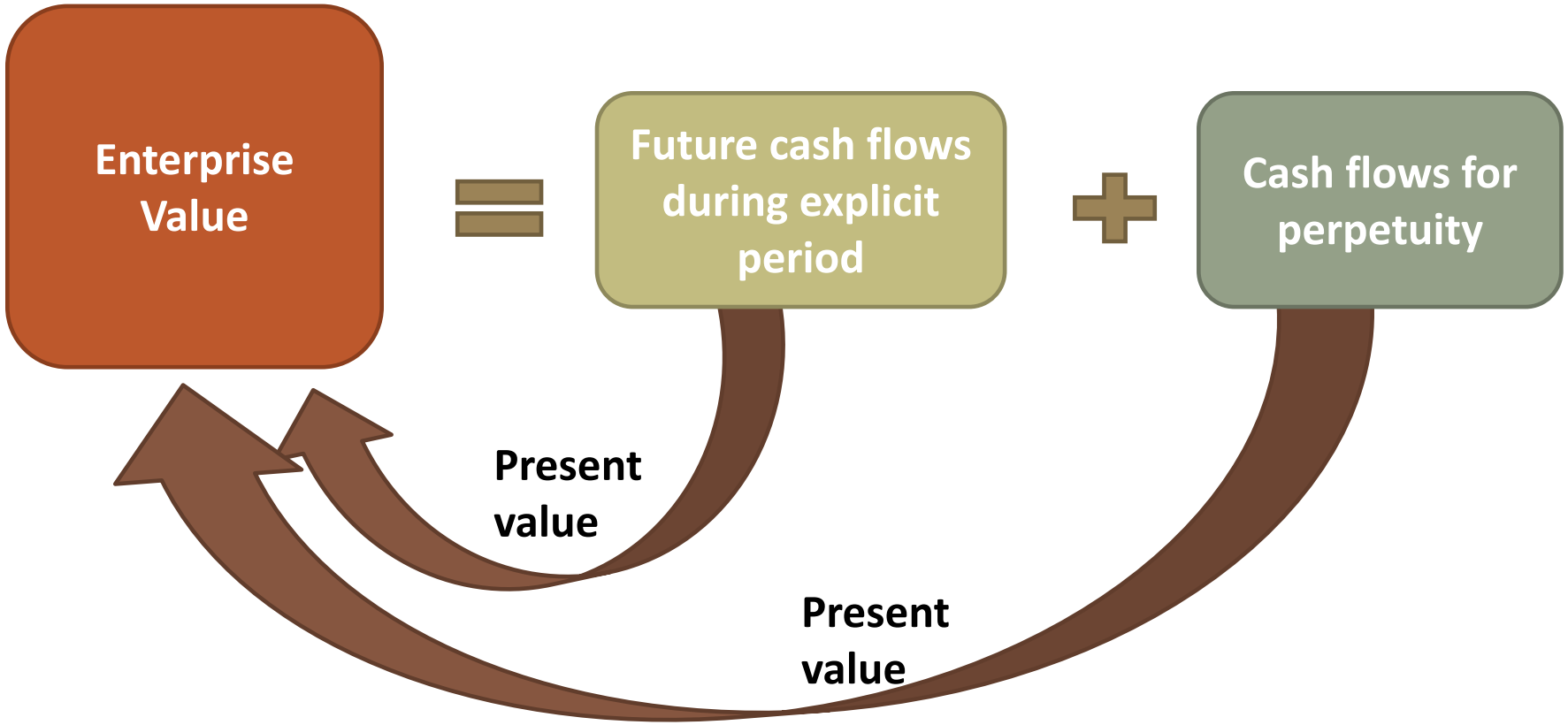
- For instance, a firm with expected revenues of Rs.6 billion ten years from now will have an estimated terminal value in that year of Rs.12 billion if a value to sales multiple of 2 is used. If FCFE model, use equity multiples such as price earnings ratios to arrive at the terminal value

Stable Growth Approach

- It is assumed that firm has a finite life with constant growth rate

$$\text{Terminal Value} = \frac{\text{Cash flow } t + 1}{(r - g \text{ stable})}$$

DCF VALUE


Enterprise Value
=
Future cash flows during explicit period
+
Cash flows for perpetuity
Present value
Present value

ADJUSTMENTS

- Market value of the investments
- Other non-operating surplus assets
- Surplus cash
- Contingent liabilities / assets
- Loan Funds
- Preference Share Capital

WHEN TO USE ?

1. • Most appropriate for valuing firms
2. • Limited life projects
3. • Large initial investments and predictable cash flows
4. • Regulated business
5. • Start-up companies

EXAMPLE – FREE CASH FLOW TO FIRM

(INR Million)

Particulars		2018-19	2019-20	2020-21	2021-22	2022-23	Perpetuity
EBITDA		**556**	**642**	**728**	**755**	**792**	
Less: Outflows							
Capital Expenditure		45	45	45	45	45	
Incremental Working Capital		20	30	25	33	40	
Tax		158	182	182	204	214	
Total Outflow		**223**	**257**	**252**	**282**	**299**	
Free Cash Flow (FCF)		**333**	**385**	**476**	**473**	**493**	
Cash Flow for 2022-23							**493**
Growth Rate							3%
Capitalised Value for Perpetuity							**5,116**
Discounting Factor	12.93%	0.89	0.78	0.69	0.61	0.54	0.54
Net Present Value of Cash Flows		**295**	**302**	**331**	**291**	**269**	**2,785**
Enterprise Value							**4,272**
Less: Loan Funds							(930)
Add: Surplus Cash							150
Add: Value of Investments							850
Adjusted Value For Equity Shareholders							**4,342**
No. of Equity Shares							**9,00,000**
Value per share (INR) (FV INR 10)							**4,824**

EXAMPLE – FREE CASH FLOW TO EQUITY

(INR Million)

Particulars		2018-19	2019-20	2020-21	2021-22	2022-23	Perpetuity
EBTDA		**500**	**598**	**682**	**709**	**746**	
Less: Outflows							
Add/Less: (Loan taken)/Repaid		37	37	37	37	37	
Capital Expenditure		45	45	45	45	45	
Incremental Working Capital		20	30	25	33	40	
Tax		158	182	182	203	214	
Total Outflow		**260**	**294**	**289**	**319**	**336**	
Free Cash Flow (FCF)		**240**	**304**	**393**	**390**	**410**	
Cash Flow for 2022-23							**410**
Growth Rate							3%
Capitalised Value for Perpetuity							**3,770**
Discounting Factor	14.20%	0.88	0.77	0.67	0.59	0.51	0.51
Net Present Value of Cash Flows		**210**	**233**	**264**	**230**	**211**	**1,941**
Enterprise Value							**3,088**
Add: Surplus Cash							150
Add: Value of Investments							850
Adjusted Value For Equity Shareholders							**4,088**
No. of Equity Shares							**9,00,000**
Value per share (INR) (FV INR 10)							**4,543**

ISSUES IN DCF VALUATION

ISSUES IN DCF VALUATION

- Projections are highly subjective hence could be inaccurate
- Inapplicable where projections cannot be made for the horizon period
- Difficulties in measuring risks
- Loss making companies
- Start-up companies
- Assumptions about cash flows and discount rates to be internally consistent (e.g. pre-tax/post-tax discount rate)
- Discount rates to be consistent with underlying currency in which cash flows are made

JUDICIAL PRONOUNCEMENTS

JUDICAL PRONOUNCEMENTS

"Exchange Ratio not disturbed by Courts unless objected and found grossly unfair"

- Miheer H. Mafatlal Vs. Mafatlal Industries (1996) 87 Com Cases 792
- Dinesh v. Lakhani Vs. Parke-Davis (India) Ltd. (2003) 47 SCL 80 (Bom)

"Valuation will take into account number of factors such as prospective yield, marketability, the general outlook for the type of business of the company, etc. Valuation is an art, not an exact science. Mathematical certainty is not demanded, nor indeed is it possible"

- Viscount Simon Bd in Gold Coast Selection Trust Ltd. vs. Humphrey reported in 30 TC 209

  (House of Lords)

JUDICAL PRONOUNCEMENTS

“It is fair to use combination of three well known methods - asset value, yield value & market value”

- Hindustan Lever Employees ‘ Union Vs. HLL (1995) 83 Com. Case 30 SC

“No valuation is to be disregarded merely because it has used one or the other of various methods. It must be shown that the chosen method of valuation is such as has resulted in an artificially depressed or contrived valuation well below what a fair-minded person may consider reasonable.”

- Cadbury India Limited Vs. Mrs Malati Samant and Mr Alok C. Churiwala (Samant Group and Churiwala Group) (2014) (Bom HC)

THANK YOU !