

Valuation – Discounted Cash Flow Method with case studies

Bengaluru Branch of SIRC of ICAI

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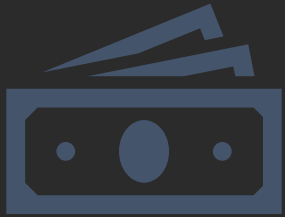
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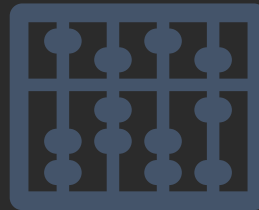


Topics to be discussed



Business Valuation

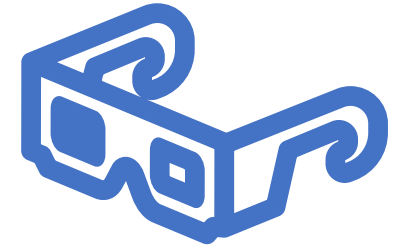
Key Terms, Purpose,
Approaches, Methods



DCF

Technicals, Key Terms,
Case Studies

Important Terms



- Fair Value - the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between 'market participants' at the measurement date.
- Price - the amount of money expected, required, or given in payment for something.
- Relative Value - determining an asset's worth that takes into account the value of similar assets – using similar valuation metrics and methodologies.

- Participant specific value - The estimated value of an asset or liability considering specific advantages or disadvantages of either of the owner or identified acquirer or identified participants.
- Value in Use – Valuation when the asset continues to operate in the current state i.e. without considering any incremental capital expenses in the Cash flows.
- Liquidation value - The amount that will be realized on sale of an asset or a group of assets when an actual/hypothetical termination of the business is contemplated/assumed.
Liquidation value can be carried out under the premise of
 1. Orderly transaction - normal marketing period, or
 2. Forced transaction - a shortened/no marketing period.

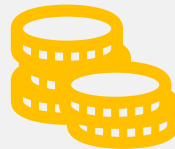
What is the starting point for any valuation requirement?



What is the purpose of valuation?



What is the stage of Business?



Different perspectives for valuation

Purpose and Basis



Valuation – Purpose is a key driver which decides the Basis

Income Tax Act	FEMA	Companies Act	Acquisitions / Fund Raising	Mergers	Joint venture	Accounting Purposes
<ul style="list-style-type: none">• Section 56(2)viiib read with Rule 11UA2• Section 56(2)xc read with Rule 11UA1c	<ul style="list-style-type: none">• International Accepted Pricing Methodology	<ul style="list-style-type: none">• Fair Value	<ul style="list-style-type: none">• Fair Value• Price	<ul style="list-style-type: none">• Relative Value	<ul style="list-style-type: none">• As per Agreement / Fair Value	<ul style="list-style-type: none">• Value in Use• Fair value less costs to sell

Stages of Business



Different stages of business

- Ideation Stage / Start up / NIL Revenue
- Revenue Commencement and Expansion
- High Growth
- Matured Companies
- Liquidation Stage





Approaches

Fair Value Approaches

Income Based Approach

- Discounted cash flow method
- Direct Capitalisation

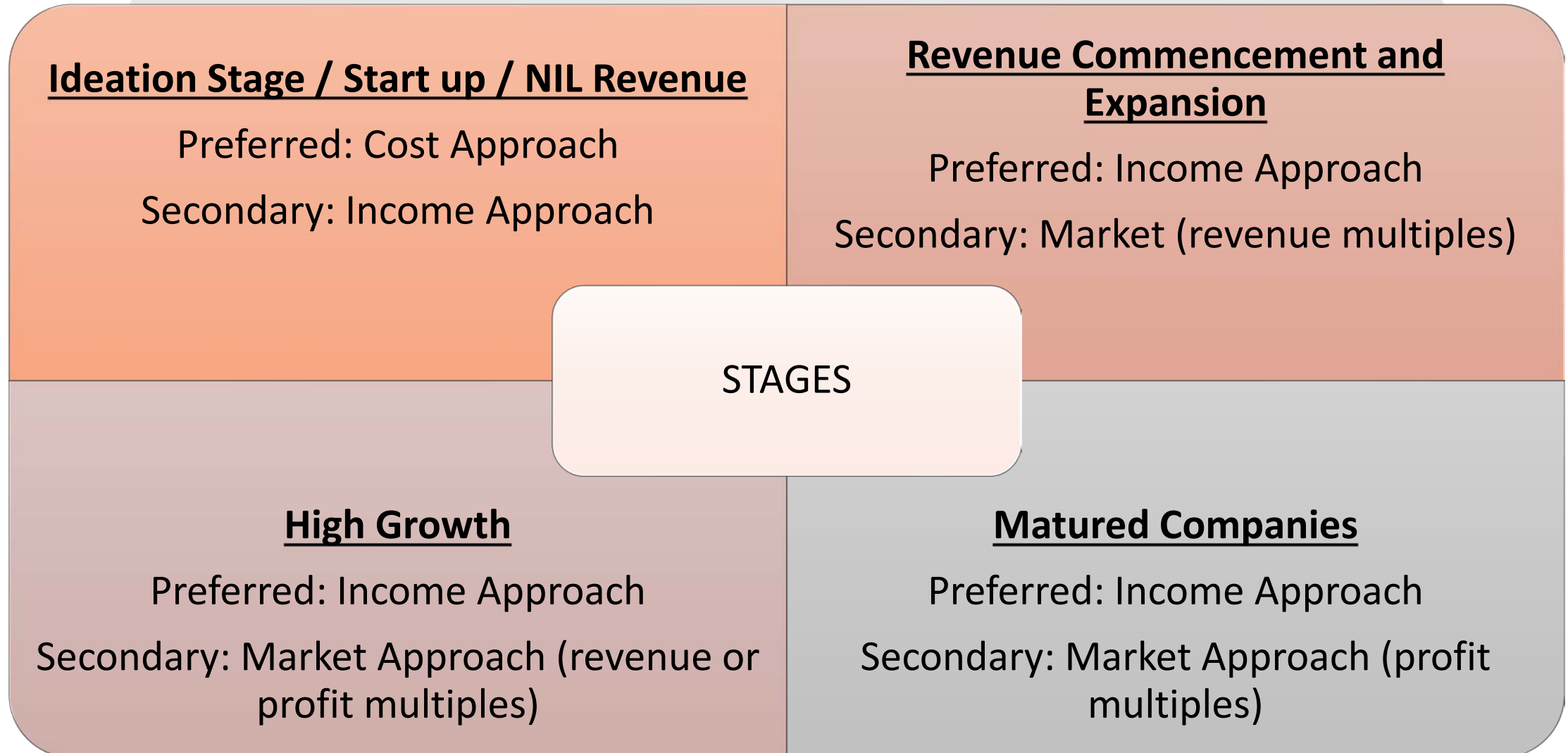
Market Based Approach

- Quoted Prices for Listed Companies
- Comparable Companies
- Comparable Transactions

Cost / Asset Based Approach

- Net Asset Value
- Replacement Cost
- Reproduction Cost
- Liquidation Value Method

Different stages of business and approaches relevant for valuation



Discounted Cash Flow Method (DCF)



Various terminologies used in DCF method



Free Cash Flow



Free Cash Flows to Firm (FCFF) vs. Free Cash Flows to Equity (FCFE)



Discount Rate



Explicit Period



Terminal Value



DLOM, DLOC, Control Premium



Beta vs Alpha

Projections – FCFE vs. FCFF

Free Cash Flows to Equity

- For valuation of equity stake in business
- Based on expected cash flows – net of all outflows, including tax, interest and principal payments, reinvestment needs

Particulars	Amount
PAT (Profit After Tax)	x
Add: Depreciation	x
Less: Capex	x
(Add) / Less: Increase / (Decrease) in Working Capital	x
Add / Less: Borrowings / Loan Repayment	x
Free Cash Flows to Equity (FCFE)	x

Free Cash Flows to Firm

- Value of firm for all the stakeholders – lenders and equity investors
- Business Value independent of the capital structure
- Net of tax (prior to debt payments)

Particulars	Amount
EBITDA	x
Less: Tax on EBIT	x
Less: Capex	x
(Add) / Less: Increase / (Decrease) in Working Capital	x
Free Cash Flows to Firm (FCFF)	x

CAPM / Cost of Equity

$$\text{CAPM CoE} = R_f + \beta (R_m - R_f)$$

- ✓ **Rf (Risk free rate)** – Based on the Zero coupon yield curve of Government securities having maturity of at least 10 years.
- ✓ **Rm (Return from market)** - Return from the equity market ie. long term return on Sensex.
- ✓ **Rm - Rf (the market premium)** – the excess of historical equity returns from the market over the risk free rate.
- ✓ **Beta (β)** - is a measure of the sensitivity of the movement in returns on a particular stock to movements in returns on some measure of the market (i.e. SENSEX, NIFTY etc.).

Higher the sensitivity = Higher beta = Higher risk

Beta (β)

How to obtain Beta for unlisted companies?

- ✓ Identify list of comparable listed companies and obtain their Betas
- ✓ Betas can be obtained from websites, databases, or financial magazines

Adjustment for Beta -

- ✓ Beta of listed comparable companies should be unlevered using Debt/ Equity ratios for each of the companies respectively
- ✓ The average of such should be re-levered using the Debt/ Equity ratio of the subject company

$$\beta(U) = \beta(L) / [1 + ((1-t)*(D/E))]$$



Case Studies on DCF Method



Case Study 1

Manufacturing company

Date of Valuation - 31st March 2020

Historical and Projected Data - Profit & Loss Statement

INR Crores	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25
Revenue	200.0	216.0	237.6	266.1	306.0	342.8	377.0	407.2
Expenses	184.0	196.6	213.8	236.8	269.3	301.6	331.8	358.3
EBITDA	16.0	19.4	23.8	29.3	36.7	41.1	45.2	48.9
EBITDA margin	8.0%	9.0%	10.0%	11.0%	12.0%	12.0%	12.0%	12.0%

Balance Sheet

INR Crores	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25
Assets								
Fixed Assets	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0
Net Working Capital	113.0	130.0	142.0	155.0	169.0	184.0	202.0	218.0
Cash and Bank balance	60.0	57.0	58.0	62.0	63.0	68.0	72.0	85.0
Total	203.0	217.0	230.0	247.0	262.0	282.0	304.0	333.0
Liabilities								
Share capital	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
Reserves & Surplus	160.0	174.0	187.0	204.0	219.0	239.0	261.0	290.0
<i>Subtotal</i>	168.0	182.0	195.0	212.0	227.0	247.0	269.0	298.0
Borrowings	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0
Total	203.0	217.0	230.0	247.0	262.0	282.0	304.0	333.0

Assumptions -

1. Depreciation charge is equal to asset reinvestment
2. Tax rate is assumed as 25%
3. Net WC is considered directly

Discounted Cash Flow and EV Computation

INR Crores	2020-21	2021-22	2022-23	2023-24	2024-25	TV
EBITDA	29.3	36.7	41.1	45.2	48.9	
Tax on EBIT	5.9	7.3	8.2	9.0	9.8	
Increase in WC	13.0	14.0	15.0	18.0	16.0	
Capex	3.0	3.0	3.0	3.0	3.0	
FCFF	7.4	12.4	14.9	15.2	20.1	21.1
Disc factor	0.89	0.80	0.71	0.64	0.57	0.57
PV of FCFF	6.6	9.9	10.6	9.7	11.4	12.0
Explicit value	48.2					
Terminal value	171.0					
Enterprise Value	219.2		TV = CF/(k-g)		301.4	
Less: Debt	35.0		Terminal growth rate		5%	
Add: Cash (Surplus)	58.0		Income tax rate		25%	
Equity Value	242.2		Discount rate		12.0%	

Cost of Equity (Ke)	
Rf (Risk Free rate of return - Gsec)	8.0%
Rm (Long term market return - Index)	13.0%
Rp(Rm-Rf)	5.0%
Beta	0.9
Alpha	2.5%
Ke	15.0%

$$Ke = Rf + Beta(Rp) + Alpha$$

Cost of Debt (Kd)	
Pre-tax Kd	12.0%
Tax rate	25.0%
Post -tax Kd	9.0%

D/E	
Debt to Total Capital	0.5
Equity to Total Capital	0.5

WACC	12.0%
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Suggested adjustments due to COVID19

Consider using a longer time horizon for the risk-free rate, market return, or cost of debt

Consider use of company-specific risk premiums E.g. supply chain risks, workforce limitations, curtailed operations, and a significant drop in stock price not considered in guideline public companies

Interim Impairment testing

Scaling down of Deferred Tax Assets, write offs of non-movable stock, write downs of NRV of Stocks, etc. need consideration

Case Study 2

Pharmaceutical Company

Historical and Projected Data - Profit & Loss Statement

INR Crores	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30	2030-31	2031-32
Revenue	125	133	142	153	165	179	193	208	225	243	262	283	312	343	377
Expenses	115	121	128	136	146	157	170	183	198	214	231	249	268	295	324
EBITDA	10.0	11.9	14.2	16.8	19.8	21.4	23.1	25.0	27.0	29.2	31.5	34.0	43.6	48.0	52.8
EBITDA margin percentage	8.0%	9.0%	10.0%	11.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	14.0%	14.0%	14.0%

Projected Balance Sheet

INR Crores	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30	2030-31	2031-32
Assets															
Fixed Assets	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0
Working Capital	110.0	121.0	130.0	141.0	153.0	165.0	178.0	191.5	206.0	221.5	238.5	257.0	283.0	312.0	335.0
Cash and Bank balance	61.0	52.0	46.0	42.0	38.0	30.0	31.0	28.0	29.0	31.0	34.0	40.0	43.0	51.0	54.0
Total	201.0	203.0	206.0	213.0	221.0	225.0	239.0	249.5	265.0	282.5	302.5	327.0	356.0	393.0	419.0
Liabilities															
Share capital	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
Reserves & Surplus	168.0	170.0	173.0	180.0	188.0	192.0	206.0	216.5	232.0	249.5	269.5	294.0	323.0	360.0	386.0
Subtotal	176.0	178.0	181.0	188.0	196.0	200.0	214.0	224.5	240.0	257.5	277.5	302.0	331.0	368.0	394.0
Borrowings	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0
Total	201.0	203.0	206.0	213.0	221.0	225.0	239.0	249.5	265.0	282.5	302.5	327.0	356.0	393.0	419.0

Discounted Cashflow

INR Crores	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30	2030-31	2031-32	TV
EBITDA	16.8	19.8	21.4	23.1	25.0	27.0	29.2	31.5	34.0	43.6	48.0	52.8	
Tax on EBIT	3.4	4.0	4.3	4.6	5.0	5.4	5.8	6.3	6.8	8.7	9.6	10.6	
Increase in WC	11.0	12.0	12.0	13.0	13.5	14.5	15.5	17.0	18.5	26.0	29.0	23.0	
Capex	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	
FCFF	(2.5)	(1.1)	0.1	0.5	1.5	2.1	2.8	3.2	3.7	3.9	4.4	14.2	528.1
Disc factor	0.88	0.78	0.69	0.61	0.54	0.48	0.42	0.38	0.33	0.29	0.26	0.23	0.23
Discounted FCFF	(2.2)	(0.9)	0.1	0.3	0.8	1.0	1.2	1.2	1.2	1.2	1.1	3.3	121.6

Explicit value	8.3
Terminal value	121.6
Enterprise Value	129.9
Less: Debt	25.0
Add: Cash	46.0
Equity Value	150.9

TV(EBITDA multiple of 2031-32)

10

Income tax rate

25%

Discount rate

13.0%

Cost of Equity (Ke)	
Rf	8.0%
Rm	13.0%
Rp(Rm-Rf)	5.0%
Beta	0.9
Alpha	2.5%
Ke	15.0%

Cost of Debt (Kd)	
Pre-tax Kd	12.0%
Tax rate	25.0%
Post -tax Kd	9.0%

D/E	
D/E	0.5:1
Debt to Total Capital	0.33
Equity to Total Capital	0.67

WACC	13.0%
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Case Study 3

Mining Company

Historical and Projected Data - Profit & Loss Statement

INR Crores	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30	2030-31	2031-32
Revenue	165	172	178	186	193	201	209	217	226	235	244	254	264	275	286
Expenses	142	148	153	160	166	173	180	187	194	202	210	218	227	236	246
EBITDA	23	24	25	26	27	28	29	30	32	33	34	36	37	38	40
Depreciation	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
EBIT	19.1	20.0	21.0	22.0	23.0	24.1	25.2	26.4	27.6	28.9	30.2	31.6	33.0	34.5	36.0
Interest	10.5	9.6	8.7	7.8	6.9	6.0	5.0	4.1	3.2	2.3	1.4	0.5	0.2	0	0
PBT	8.6	10.4	12.3	14.2	16.1	18.1	20.2	22.3	24.4	26.6	28.8	31.1	32.8	34.5	36.0
Income tax	2.2	2.6	3.1	3.5	4.0	4.5	5.1	5.6	6.1	6.6	7.2	7.8	8.2	8.6	9.0
PAT	6.5	7.8	9.2	10.6	12.1	13.6	15.2	16.7	18.3	19.9	21.6	23.3	24.6	25.8	27.0

Assumptions:

The liquidation value is net book value itself

Fixed project life - ends by 31st March 32

Historical and Projected Balance Sheet

INR Crores	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30	2030-31	2031-32
Fixed Assets	120.0	120.0	120.0	120.0	120.0	120.0	120.0	120.0	120.0	120.0	120.0	120.0	120.0	120.0	120.0
Working Capital	100.0	115.0	125.0	127.6	131.3	133.1	134.1	139.1	139.3	141.6	145.0	156.6	161.3	166.1	139.1
Cash and Bank balance	63.0	45.8	35.0	33.1	31.5	33.2	37.4	39.1	47.2	54.9	63.1	64.8	74.7	95.7	149.7
Total	283.0	280.8	280.0	280.7	282.8	286.3	291.5	298.2	306.5	316.5	328.1	341.4	356.0	381.8	408.8
Share capital	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
Reserves & Surplus	155.0	162.8	172.0	182.7	194.8	208.3	223.5	240.2	258.5	278.5	300.1	323.4	348.0	373.8	400.8
Borrowings	120.0	110.0	100.0	90.0	80.0	70.0	60.0	50.0	40.0	30.0	20.0	10.0	0	0	0
Total	283.0	280.8	280.0	280.7	282.8	286.3	291.5	298.2	306.5	316.5	328.1	341.4	356.0	381.8	408.8

Mining Company

Discounted Cashflow

INR Crores	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30	2030-31	2031-32	TV
Number of years into Project	9	10	11	12	13	14	15	16	17	18	19	20	
PAT	10.6	12.1	13.6	15.2	16.7	18.3	19.9	21.6	23.3	24.6	25.8	27.0	
Add:Dep	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Increase in WC	2.6	3.7	1.8	1	5	0.2	2.3	3.4	11.6	4.7	4.8	(27)	
Capex	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Debt repayments	10	10	10	10	10	10	10	10	10	10	0	0	
FCFE	-2.0	-1.6	1.8	4.2	1.7	8.1	7.6	8.2	1.7	9.9	21.0	54.0	408.8
Disc factor	0.87	0.76	0.66	0.57	0.50	0.43	0.38	0.33	0.28	0.25	0.21	0.19	0.19
PV of FCFE	(1.71)	(1.22)	1.17	2.39	0.86	3.51	2.87	2.68	0.48	2.44	4.52	10.09	76.41

Explicit value	28.09
Terminal value	76.41
Add: Cash	35.00
Equity Value	139.50

TV as % of Networth of 2031-32	100%
Income tax rate	25%
Discount rate	15.0%

Cost of Equity (Ke)	
Rf	8.0%
Rm	13.0%
Rp(Rm-Rf)	5.0%
Beta	0.9
Alpha	2.5%
Ke	15.0%

Valuation Conclusion



Conclusion –

1. Subjective process.
2. Judgemental process.

Conclusion can be drawn based on any or all applicable approach/es as discussed in previous slides based on stage of Company and other parameters.

Rs. Millions

INR Crore	Equity Value	Weights	Amount
Income Approach	500	2	200
Market Approach	350	2	140
Cost Approach	450	1	90
EQUITY VALUE		5	430

Why Discounted Free Cash Flow Valuation ?

- DCF is based on Free Cash Flows, which is a reliable measure
- It is an internationally accepted method
- Useful in estimating the Company's intrinsic value
- Extremely detailed
- Multiple scenarios can be built in
- Room for sensitivity analysis
- Can be used even when comparable companies information is not available
- Used to calculate the IRR

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Thank you!

Shravan Guduthur

Partner, Ananth Shravan & Co.,

Chartered Accountants