MODULE VIII – VALUATION APPLICATION – EQUITY / BUSINESS VALUATION

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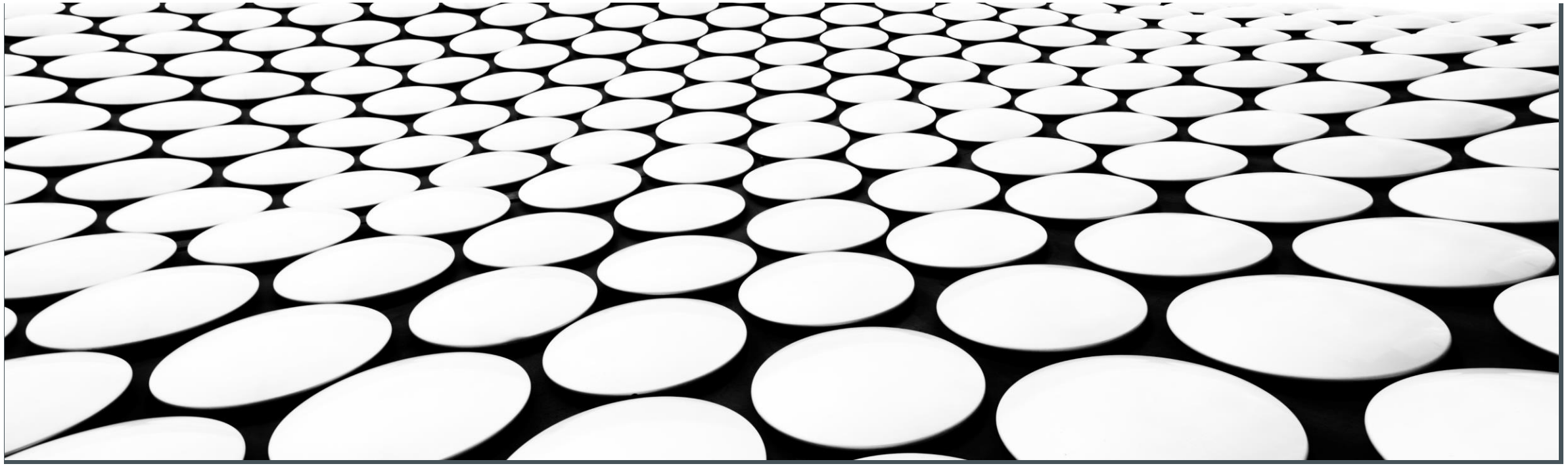


VALUATION APPLICATION –EQUITY AND BUSINESS VALUATION

VALUATION APPLICATION

What is the equity value?

Equity Value is the value of the business attributable to equity shareholders. It can also be formulated as:

Equity value = Market capitalization

Add: fair value of all stock options (in the money and out of the money)

Add: Value of convertible securities in excess of what the same securities would be valued without the conversion attribute.

VALUATION APPLICATION

What is enterprise value?

Enterprise Value is the value attributable to the equity shareholders plus the value of debt and debt like items, minority interest, preference share less the amount of non-operating cash and cash equivalents. It can also be formulated as:

Enterprise value = Common equity at equity value

+ Debt at market value

+ Minority Interest at market value if any

- Short term and long-term investments

- Associate company at market value if any

+ Preference capital at book value

- Cash and cash-equivalents.

VALUATION APPLICATION

Going concern versus Asset Valuation

- The value of an asset in the discounted cash flow method, is the present value of expected cash flows generated out of that asset. The value of a business is the sum total of values of individual assets owned by the business. Theoretically, this concept may be right but from practical perspective there is always variance between valuing a collection of assets and that of a business.

- Valuation of business is done based on going concern, which is based on financial statements of an entity. In going concern valuation, best judgement is applied not only on existing investments but also on expected future investments and their profitability as well.

- On the other hand on asset-based valuation the focus is primarily on the assets in place and value of each asset is estimated separately. For entities with lucrative growth opportunities, asset-based valuation will yield lower values whereas based on going concern the values will be higher.

VALUATION APPLICATION

Equity Valuation versus Firm Valuation

- The cash flows which remain after debt payments and reinvestment needs are called free cash flows and this relates to equity holders. The discount rate that reflects just the cost of equity financing is called the cost of equity. Hence valuation of equity stake in the business is referred to as equity valuation.

- Whereas, the firm valuation comprises discounting of future cash flows approach generated from both the assets-in-place and growth assets.

- The discount rate is the weighted average cost of equity and debt which is called the weighted average cost of capital (WACC).

DISCOUNTED CASH FLOW METHOD

- Discounted Cash Flow method has its foundation in the present value concept and the time value of money.

- In this method the value of any asset is the present value of expected future cash flows that the asset generates.

- To carry out valuation in this method, we need to

  (a) Estimate the life of the asset

  (b) Estimate the cash flows during the life of the asset

  (c) Estimate the discount rate to apply to these cash flows to get present value

DISCOUNTED CASH FLOW MODELS

- In the first scenario, we bifurcate the cash flows into normal return scenario and excess return cash flows.
- Earning the risk-adjusted required return (measured through weighted average cost of capital or equity) is considered normal return cash flows.
- But any cash flow above or below this return would be treated as excess or short return. Accordingly, the value of business would be:

Value of business = cash flow from existing business + present value of excess return cash flows from both existing and future projects

DISCOUNTED CASH FLOW MODELS

- In the second scenario, called adjusted present value (APV) approach, we segregate the effects on value of debt financing from the value of the assets of a business.
- Using debt to fund a firm's operations creates tax benefits (as interest expenses are net of tax) on the plus side and increases in bankruptcy risks (and expected bankruptcy costs) on the minus side.
- In this approach, the value of a firm would be as under:

Value of business = value of business with 100% equity financing + present value of expected tax benefits of debt – expected bankruptcy costs

DISCOUNTED CASH FLOW MODELS - determinants

- **Discount rates**
  - **Weighted Average Cost of Capital (WACC) method**
  - **Adjusted Present Value (APV) Method**
- **Expected growth -** needs to be estimated taking into account the past trend as well as future business scenario both external and internal in nature
- **Expected cash flows**
  - This is derived by obtaining cash flows prior to debt and preferred dividend payments, by subtracting from the after-tax operating income the net investment needs to sustain growth.
  - This cash flow is called the free cash flow to the firm (FCFF) and the models that use these cash flows are called FCFF Models.
  - Free cash flow to equity model is called FCFE Model.

DISCOUNTED CASH FLOW MODELS – Net Present Value

- The concept of Net Present Value centres around the time value of money. In simple words it states that the value of Rupee today is worth more than value of Rupee say a year from now.
- The basic reason is that a Rupee today can be invested in risk-free interest like Government securities and can earn a return. A rupee a year down the road is worth less today as it has not earned interest it would have earned had it been invested today.
- Hence the value of NPV is as under:

Present Value = Future value/$(1 + Rd)^n$
Where, Rd = the discount rate and
n = Number of years in the future

The concept of NPV uses discount rates based on whether APV method or WACC method is used, and the formula is as under:

$$NPV = FCF1/(1+Rd)^1 + FCF2/(1+Rd)^2 + FCF3/(1+Rd)^3 + ... + FCF10/(1+Rd)^{10}$$

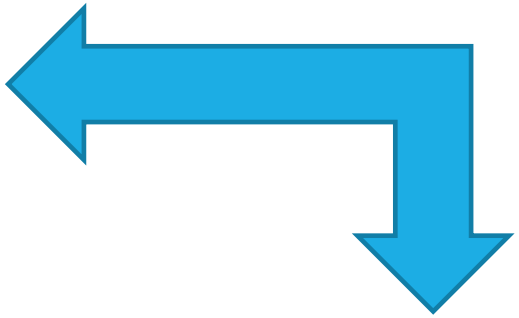
Or

$$= \text{Sigma } n = FCFi/(1+Rd)^i, \quad i = 1$$

Where, FCF1 = Free Cash flow for year 1 and so on
Rd = Discount rate

DISCOUNTED CASH FLOW – FCFF MODEL

Definition of FCFF model is



FCFF = NOP – Taxes – Net Investment – Net change in Working Capital

Or

FCFF = Net Income + Non-cash charges + Interest (I-T) – Net investment – Net change in working capital

DISCOUNTED CASH FLOW – FCFF MODEL

Year	0	1	2	3	4	5	Remarks
Revenue Costs Depreciation on assets	X X X	X X X	X X X	X X X	X X X	X X X	Non-cash item
Profit before tax Taxation	X (x)	X (x)	X (x)	X (x)	X (x)	X (x)	
Net operating profit after tax (NOPAT) Add: Depreciation	X X	X X	X X	X X	X X	X X	Adjustment of non-cash item
Operating cash flow	X	X	X	X	X	X	
Add: Capital expenditure	X	X	X	X	X	X	
Add: Change in working capital	X	X	X	X	X	X	
Free cash flow to Firm	X	X	X	X	X	X	

DISCOUNTED CASH FLOW – FCFF MODEL

- **Free cash flow to Equity model** is a variant of the same which measure how much cash can be paid to the equity shareholders of the company after all expenses, reinvestment and debt repayment.

- Free cash flows to equity represents cash flow a company generates after necessary expenses and after satisfaction of claims of debt holders.

- It is derived out of Free Cash flow to the Firm (FCFF) as under:

  FCFE = FCFF – After tax interest expenses + Net borrowing

- If the company borrows more in a year than it repays it will have additional funds that could be distributed to shareholders, hence net borrowing has been added to FCFF in order to arrive at FCFE.

ILLUSTRATION I – FCFF MODEL

Please calculate Free Cash Flow to Firm from the following:
Sales: Rs.100000,
Costs: Rs.75000,
Depreciation: Rs.20000,
Tax: 35%,
Change in working capital Rs.1000,
Capital expenditure Rs.10000.

ILLUSTRATION I – FCFF MODEL

Solution

Particulars	Amount
Sales	100000
Less: Costs	75000
Depreciation	20000
Profit before tax	5000
Less: Tax @ 35%	1750
Profit after tax	3250
Add: Depreciation	20000
Less: Capital expenditure	10000
Less: Change in working capital	1000
Free Cash Flow to Firm (FCFF)	12250

DISCOUNTED CASH FLOW – FCFE MODEL

Year	0	1	2	3	4	5	Remarks
Revenue Costs Depreciation on assets	X X X	X X X	X X X	X X X	X X X	X X X	Non-cash item
Profit before tax Taxation	X (x)	X (x)	X (x)	X (x)	X (x)	X (x)	
Net operating profit after tax (NOPAT) Add: Depreciation	X X	X X	X X	X X	X X	X X	Adjustment of non-cash item
Operating cash flow	X	X	X	X	X	X	
Add: Capital expenditure	X	X	X	X	X	X	
Add: Change in working capital	X	X	X	X	X	X	
Free cash flow to firm	X	X	X	X	X	X	
Less: After tax interest expense (I X (1 – T)	X	X	X	X	X	X	
Add: Net borrowing	X	X	X	X	X	X	
Free Cash Flow to Equity (FCFE)	X	X	X	X	X	X	

ILLUSTRATION II – FCFE MODEL

Please calculate Free Cash Flow to Equity from the following:
Sales: Rs.100000,
Costs: Rs.75000,
Depreciation: Rs.20000,
Tax: 35%,
Change in working capital Rs.1000,
Capital expenditure Rs.10000.
Interest Rs.1000.
The company resorts to net borrowing of 6000.

ILLUSTRATION II – FCFE MODEL

Solution

Particulars	Amount
Sales	100,000
Less: Costs	75,000
Depreciation	20,000
Interest	1,000
Profit before tax	4,000
Less: Tax @ 35%	1,400
Profit after tax	2,600
Add: Depreciation	20,000
Less: Capital expenditure	10,000
Less: Change in working capital	1,000
Free Cash Flow to Firm (FCFF)	11,600
Less: After tax interest expense i.e.(1000 × (1-0.35)	650
Add: Net borrowing	6,000
Free Cash Flow to Equity (FCFE)	16,950

CAPITAL ASSET PRICING MODEL

- This is a model used to calculate expected return on investment also referred to as the expected return on equity. This is a linear model with one independent variable called Beta.
- The CAPM formula is as under:

Ke	= Rf + Beta (Rm – Rf)
Where Ke	= Discount rate for an all equity firm
Rf	= Risk free rate (e.g. Government securities)
Rm	= Market return
Rm-Rf	= Risk premium being excess market return
Beta	= Equity Beta

- Beta represents relative volatility of the investment in question vis-à-vis the market.
- This means if Beta is 1, it means the degree of volatility of the investment is identical to that of the market returns.
- If Beta is less than 1 then the return on the investment (say a utility company), is less volatile than the market.
- Conversely, if Beta is greater than 1, then the return on the target investment (say a dot.com company) is more volatile than that of the market.

STEPS FOLLOWED FOR FCFF VALUATION

Step I:

Estimate free cash flow to equity.

Free cash flow to equity = Net Income – Capital expenditure + Depreciation – Working capital accruals + New debt issued – debt repayment

Step II

Calculate the PV of equity cash flows by using cost of equity (Ke) as discounting rate.

Step III

Cost of Equity can be calculated using CAPM (Capital Asset Pricing Model) approach

FCFF VALUATION WITH STABLE GROWTH RATE

- The value of equity under stable growth FCFF model is a function of the following:
  (a) expected FCFE in the next period
  (b) the stable growth rate
  (c) the required rate of return
  and the formula is

$$P_o = FCFE_1/(r - g_n)$$

where, P_o = Value of stock today
$FCFE$ = Expected FCFE next year
R = Cost of equity of the firm
G_n = Growth rate in FCFE for the firm forever.

ILLUSTRATION III – VALUATION OF SHARES

Earnings per share	= Rs.3.15
Capital expenditure per share	= Rs.3.15
Depreciation per share	= Rs.2.78
Change in working capital per share	= Rs.0.50
Debt financing ratio	= 25%

Earnings, capital expenditure, depreciation and working capital are all expected to grow at 6% per year.
The beta for stock is 0.90. Treasury bond rate is 7.5%. Rate of return for common stocks 12%
Calculate value of shares.

ILLUSTRATION III – VALUATION OF SHARES

Solution

Solution

As per CAPM approach cost of equity would be as follows:

Cost of equity = 7.5% + 0.90 (12% -7.5%)
= 7.5% + 0.90 x 4.5%
= 7.5% + 4.05%
= 11.55%

Expected growth rate = 6%

Base year FCFE = Rs.3.15 – (Rs.3.15 – Rs.2.78) (1 – 0.25) – 0.50 (1 – 0.25) = 2.4975

Value per share = (2.4975 × 1.06/(0.1155 – 0.06)
= 2.4975 × 19.0991
= 47.70

TWO STAGE FCFE MODEL

- **Two stage FCFE model**

  In the two stage FCFE model, the value of stock would comprise:

  (i) The present value of the FCFE per year for the extra-ordinary growth period and

  (ii)Terminal value at the end of the period

Hence, value of stock = PV of FCFE + PV of Terminal price

= Sigma t=n FCFEt (1+r) t + Pn (1+r) n

Where, FCFEt = FCFE in year t

Pn = Price at the end of extra ordinary growth period

R = Required rate of return to equity investors in high growth period.

The terminal value is calculated using the infinite growth rate model:

Pn = FCFE n+1 (rn – gn)

Where, gn = Growth rate after the terminal year forever

Rn = Required rate of return to equity investors in stable growth period

THREE STAGE FCFE MODEL – E MODEL

Three stage FCFE model – E model

The three stage FCFE model – called the E model – is designed to value firms that are expected to go through three stages of growth, namely,

(i) An initial phase of high growth,

(ii) A transitional period where growth rate declines and

(iii) A steady state where growth rate is stable.

The formula is as under:

Po = Sigma t=n1 = FCFEt/(1 +r) t + Sigma t
= 2 FCFE1/(1 +r) t + Pn2/(1+r) 2

Where Po = Value of stock today
FCFEt = FCFE in year t
T = Cost of equity
R = required rate of return
Pn2 = Terminal value at the end of transition period
= FCFEn2 + 1/(r – gn)
n1 = End of initial high growth period
n2 = End of transition period

APPROPRIATE DISCOUNT RATE UNDER DCF MEHOD

- There are two ways to use discount rates to value under DCF method:

- ❑ Weighted Average Cost of Capital (WACC) method
- ❑ Adjusted Present Value (APV) Method

WEIGHTED AVERAGE COST OF CAPITAL METHOD

- For WACC, the discount rate is calculated as under:

WACC = (E/(D + E)) X Re(leveraged) + (E/(D + E)) X (1 – t) x Rd
Where, D = Market value of debt
E = Market value of equity
Rd = Discount rate for rate (average long term debt)
Re (leveraged)= Discount rate for leveraged equity (calculated using CAPM)

- We know CAPM formula is revisited as under:

CAPM = Rf + Beta L (Rm – Rf)
Where, Rf = Risk free rate
Rm = Market rate of return
Rm – Rf = Excess Market return - risk premium
Beta L = Leveraged Beta

- The value of leveraged beta can be derived out of unlevered beta based on the equation below, a process which is called unlevering of beta.

Beta L = Beta u x [(1 + (1- t) D)/E]
Where, Beta u = Unlevered Beta
D = Market value of debt
E = Market value of equity

ADJUSTED PRESENT VALUE (APV) METHOD

- In case of APV approach the CAPM formula undergoes a change as we can see in the following formula:

CAPM		= Rf + Beta u (Rm – Rf)
Where,	Rf	= Risk free rate
	Rm	= Market rate of return
	Rm – Rf	= Excess Market return - risk premium
	Beta u	= Unleveraged Beta

- This signifies that in case of APV approach we assume the unlevered beta approach, which assumes unleveraged equity discount rate, meaning that debt is zero. On the other hand WACC approach assumes leveraged beta, which signifies leveraged (historical) discount rate.
- In case the company has debt, as APV does not capture the real value of the enterprise. Hence in such cases we need to add the value of Debt Tax Shield or the amount the company saves by not having to pay interest on debt. To adjust this difference a value of Debt Tax Shield (DTS) is added to the overall value of the enterprise.
- The formula of Debt Tax Shield is as under:

DTS = D X Rd x t
Where,D = Total debt of the company in the period under consideration
Rd = Weighted average rate of interest
T = Corporate tax rate

TERMINAL VALUE

- According to Indian Valuation Standards 103, 2018 issued by ICAI, terminal value represents the present value at the end of explicit forecast period of all subsequent cash flows to the end of the life of the asset or into perpetuity if the asset has an indefinite life.
- The terminal value calculation is based on the premise that the cash flows of final year of projection (usually year 10 in a ten year projection) will keep growing at a particular rate of growth. The rate of growth would not be as high as the growth in the first ten years, as it is expected that the enterprise growth has stabilised in the first ten years. Hence a reasonable estimate of growth may be considered. The terminal value is calculated as under:

Terminal value = (Terminal year $FCF_{10} \times (1 + g))/(Rd - g)$

This is discounted as under:

Present value of Terminal Value

$= (FCF\ 10\ X\ (1 + g)/((1 + Rd)_{10} \times (Rd - g))$

- Finally, the present value of free cash flows of each year are aggregated with the present value of terminal value at the final year of projection to arrive at the final enterprise valuation.

METHODS OF ESTIMATING TERMINAL VALUE

(a) Gordon (Constant) Growth Method	The terminal value under this method is computed by dividing the perpetuity maintainable cash flows with the discount rate as reduced by the stable growth rate. Here it is assumed that the assets grow or decline at constant rate beyond the forecast period.
(b) Variable Growth Method	This method assumes that the asset grows (or declines) at variable rate beyond the forecast period.
(c) Exit Multiple Method	This method involves application of a market-evidence based capitalisation factor or a market multiple (for example, Enterprise Value (EV)/Earnings before Interest, Tax, Depreciation and Amortisation (EBITDA), EV/Sales) to the perpetuity earnings /income.
(d) Salvage/Liquidation value Method	This method is used in cases, such as mine or oil fields, the terminal value has limited or no relationship with the cash flows projected for the forecast period. For these assets, the terminal value is calculated as the salvage or realisable value less costs to be incurred for disposing of such asset.

(*Source: Indian Valuation Standard 103, 2018 published by ICAI*)

STEPS FOR BUILD UP OF DISCOUNTED CASH FLOW

Step 1	**Estimate free cash flows for the explicit forecast period**
Step 2	Eliminate a suitable discount rate for the acquisition
Step 3	Calculate the present value of cash flows for the explicit forecast period
Step 4	Estimate the terminal value
Step 5	Determine the value of the firm
Step 6	Subtract the value of debt
Step 7	Calculate intrinsic value of equity

ILLUSTRATION IV – DISCOUNTED CASH FLOW METHOD

Step I – Estimated cash flows

Particulars	Y1	Y2	Y3	Y4	Y5
Revenues	15400	18700	23300	27900	33500
Expenses	11300	13500	17100	20500	24600
EBITDA	4100	5200	6200	7400	8900
Depreciation	500	550	600	700	900
EBIT	3600	4650	5600	6700	8000
Tax 30%	1080	1395	1680	2010	2400
PAT	2520	3255	3920	4690	5600
Add: Depreciation	500	550	600	700	900
Less: Capex	(1500)	(1500)	(1600)	(2000)	(2500)
Less: Change in Net working capital	(100)	(155)	(220)	(290)	(300)
Free Cash flow (FCF)	1420	2200	2700	3100	3700

ILLUSTRATION IV – DISCOUNTED CASH FLOW METHOD

Step II – Estimate a suitable discount rate

This step involves computation of cost of capital to the firm.
The formula of weighted average cost of capital is as under:

Ko = Ke (S/V) + Kp (P/V) + Kd (1-t) (B/V)

Where,V = Market value of the firm
S = Market value of equity
P = Market value of preference capital
B = Market value of debt
Ko = Weighted average cost of capital
Ke = Cost of equity capital
Kp = Cost of preference capital
Kd = Cost of debt and (1 – t) represents after tax cost of debt

Continuing with the above example let us assume

Ke = 15%
Kd = 8% and after tax at 30% would be 10% x (1 -0.3) = 7%

Debt/equity ratio is 1: 1

HenceKo (WACC) = 0.5 X 0.15 + 0.5 X 0.07
Ko = 0.075 + 0.035
Ko = 11%

ILLUSTRATION IV – DISCOUNTED CASH FLOW METHOD

Step III – Calculate present value of cash flows

Particulars	Y1	Y2	Y3	Y4	Y5
Revenues	15400	18700	23300	27900	33500
Expenses	11300	13500	17100	20500	24600
EBITDA	4100	5200	6200	7400	8900
Depreciation	500	550	600	700	900
EBIT	3600	4650	5600	6700	8000
Tax 30%	1080	1395	1680	2010	2400
PAT	2520	3255	3920	4690	5600
Add: Depreciation	500	550	600	700	900
Less: Capex	(1500)	(1500)	(1600)	(2000)	(2500)
Less: Change in Net working capital	(100)	(155)	(220)	(290)	(300)
Free Cash flow (FCFF)	1420	2200	2700	3100	3700
WACC = 11%	0.9009	0.8116	0.7312	0.6587	0.5934
Present value of FCFF	1279	1785	1974	2042	2196

Hence the total present value of FCFF for the five years aggregate to Rs. 9276 lakhs

ILLUSTRATION IV – DISCOUNTED CASH FLOW METHOD

Step IV – Calculate Terminal Value

Terminal value of the enterprise is calculated based on the free cash flow of the fifth year. The formula is as under:

Terminal value = (CF1 (1+g))/k-g

Where, CF1 = Cash flow of the last year

G = constant growth rate (here growth rate is assumed at 2%)

K = discount rate

Transposing the values we get the following:

= (3700 x 1.02)/(0.11-0.02) x (1/1.115)

= 3774/0.09 x 0.5934

= Rs. 24883 lakhs

ILLUSTRATION IV – DISCOUNTED CASH FLOW METHOD

Step V – Determine value of firm

Now in order to arrive at the value of the firm we have to add the following:

Present value of FCFF for five years (Step III) = Rs.9276 lakhs (A)

Present value of Terminal value at the end of five years (Step IV) = Rs.24883 lakhs (B)

Total value of firm (A + B) = Rs.34159 lakhs

ILLUSTRATION IV – DISCOUNTED CASH FLOW METHOD

Step VI – Subtract Value of debt

From the value arrived at in Step V we now need to deduct the debt and other obligations assumed by the acquirer to ascertain the value of equity.
Say the debt component of K Ltd is Rs.100.00 crores.
Hence the value of equity would be Rs.341.59 crores – Rs.100 crores = **Rs.241.59 crores**.

Step VII – Calculate intrinsic value of shares

Say, the equity share capital is Rs.100 crores at Rs.10 each per equity share.
Therefore intrinsic value of one equity share would be as under:
Value of equity (Step 6) Rs.24159,00,000 (X)
No. of equity shares 10,00,00,000 (Y)
Intrinsic value per equity share (X/Y) = Rs.24.159

THANK YOU!