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Discounted Cash Flow Analysis

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Discounted Cash Flow Analysis:

- The value of a business is the sum of the net cash flows expected to occur over the life of the business, discounted by an appropriate discount rate.

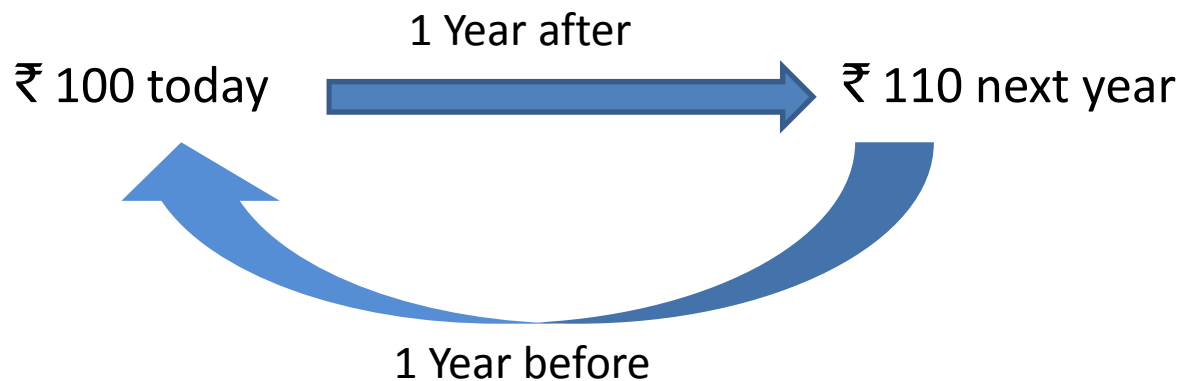
Discount Rate = opportunity cost = desired return on investment

In other words, “The value of any investment is the discounted present value of all its future cash flow”

All this sounds a little complicated?

Lets understand this step by step.

Lets forget about all the complicated terms we used and focus on a practical example.



DCF Example

Let's say you are planning to buy a computer that costs ₹ 12,000 and will generate the following returns:

	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Expected FCF	3000	3500	4000	4500	4000	19,000
Present value	2678	2790	2847	2859	2269	13,445

FCF = Future Cash Flows

Present Value = $FCF / (1+R)^n$

We assume a Discount rate (R) of = 12%

N = number of years

You will be paying ₹ 12,000 for something which is worth ₹ 13,445 (as of today).

In the above example, we assumed that the computer will have no value left at the end of 5 years but when you buy shares in a company, the company will not cease to exist after 5 or 10 years. In other words, you have to assign some value to the company beyond the period for which you discount its cash flows.

Accordingly, for equities,

Present Value is equal to the sum of the present value of:

- (**Estimated**) Future cash flows (using an appropriate discount rate); and
- Projected terminal value (i.e. estimated value beyond the forecast period)

Note that the present value is based on a prediction of future cash flows, discount rate and a terminal value and hence the results may vary significantly based on these assumptions.

Accordingly, the formula we use looks somewhat complicated on paper but is extremely easy to use once you have assumed all values.

$$\text{Present Value} = \frac{CF_1}{(1+K)^1} + \frac{CF_2}{(1+K)^2} + \dots + \frac{CF_{n-1}(1+g)}{(k-g) \times (1+k)^{n-1}}$$

Where:

PV = Present Value

CF1, CF2, = Cash Flow in the projected year

(Note: The final year cash flow is referred to as TCF or terminal year cash flow)

k = Discount rate

g = growth rate assumption in perpetuity beyond terminal year

n = the number of periods in the valuation model including the terminal year

ITC Example

Lets test this formula with a real life situation of **ITC Limited**.

We try to calculate the Present value of ITC share based on different growth (i.e. FCF) assumptions.

(scenario1 - modest) 20 %,
(scenario 2 - reasonable) 24 % and,
(scenario 3 - aggressive) 32.50 %

Terminal Growth (g) = 4%
Discount Rate = 10%

Bear in mind that in the last 10 years, ITC Limited's Free Cash Flows ("FCF") have grown at a CAGR of approximately 23% and that the company invested heavily in building up its FMCG (non-cigarette) businesses. For the financial year ended 31 March 2012 (Base Year), ITC generated FCF of ₹ 3,999.93 Cr.

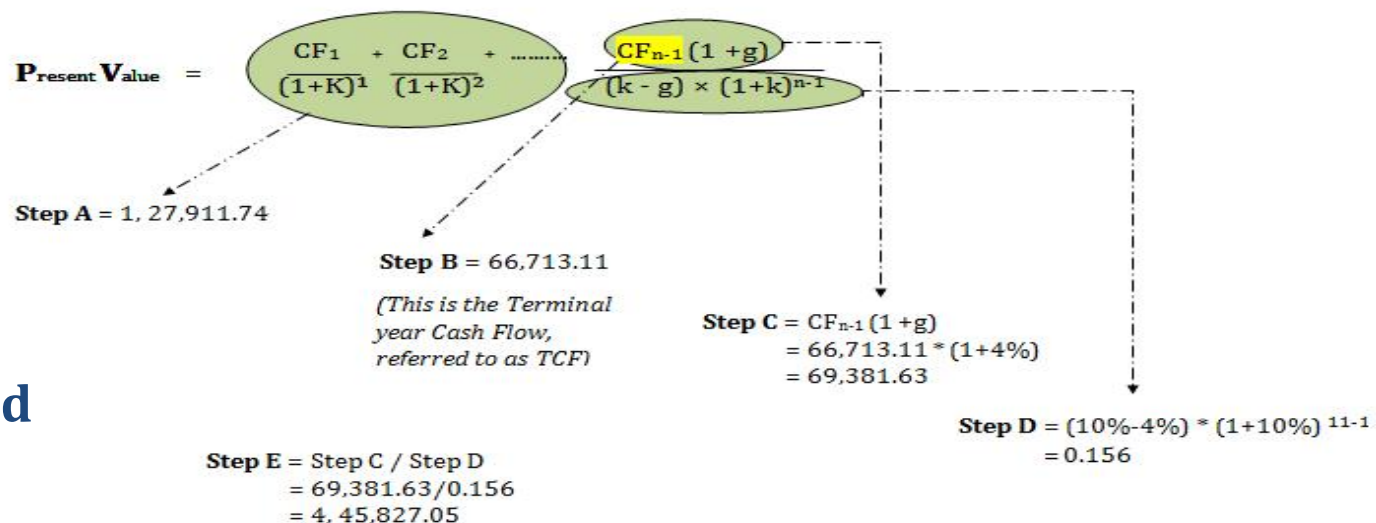
Base year FCF = Operating Cash Flow - Capital Expenditure (for the base year)

See notes in the attached Excel sheet to learn how to arrive at the most accurate FCF for the base year

Years	Growth Rate @ 20.00 %	Growth Rate @ 24.00 %	Growth Rate @ 32.50 %
	FCF (in ₹ Cr.)	FCF (in ₹ Cr.)	FCF (in ₹ Cr.)
	Present Value = 10 %	Present Value = 10 %	Present Value = 10 %
2012 (Base Year)	3,999.93	3,999.93	3999.93
2013	4,799.92	4,959.91	5,299.9
2014	5,759.90	6,150.29	7,022.4
2015	6,911.88	7,626.36	9,304.6
2016	8,294.25	9,456.69	12,328.7
2017	9,953.11	11,726.30	16,335.5
2018	11,943.73	14,540.61	21,644.5
2019	14,332.47	18,030.35	28,679.0
2020	17,198.97	22,357.64	37,999.6
2021	20,638.76	27,723.47	50,349.5
2022 [B]	24,766.51	34,377.10	66,713.1
Sum of present value (of FCF) [A]	66,583.59	81,963.38	1,27,911.74
Cash Flow in 2022 [B]	24,766.51	34,377.10	66,713.11
Terminal year cash flow [C]	25,757.17	35,752.18	69,381.63
PV of Terminal Value [E]	1,65,508.42	2,29,733.58	4,45,827.05
Market Value (A + E) (in ₹ Cr.)	2,32,092.01	3,11,696.96	5,73,738.78
No of shares (in Cr.)	787.83	787.83	787.83
Intrinsic Value	294.60	395.64	728.25

Assumption	
FCF*(2012)	3999.93
Discount rate (k)	10.00 %
k-g	6 %
Terminal Growth	4 %

Example: Calculated with the assumption of growth rate @ 32.50 %



ITC Limited



Drawbacks of the DCF Analysis

- ❑ Relax. If you do not understand the calculations , it does not make you less likely to be an ace investor.
- ❑ DCF works on too many projections and assumptions – discount rate, growth rate, terminal value etc.
- ❑ In the above example itself, depending upon your growth assumptions, the fair or intrinsic value of ITC Limited differs extensively, from ₹ 294.60 to ₹ 728.25. Although in either scenario the fair value is higher than the current 275-290 range where the stock is currently trading.

Keep in Mind:

Future is anything but predictable. Always remember "*your predictions will more often be wrong than right*" so give yourself a margin of safety (i.e. margin to go wrong). In other words, buy stocks which are available far below their fair or intrinsic value.

How far below? You must decide that based on how wrong you could be in your assumptions which is why you should always remember:

“Do not get carried away with your predictions just because you like a stock, or a business model, or because everyone thinks that a particular stock or business model is set for exponential growth”

(in fact, try to be very careful of the last set of stocks).

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