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# Discounted Cash Fows - a Primer

## Application of the Discounted Cash Flow (DCF) method

A discounted cash flow valuation is used to determine whether an investment will give the desired rate of return or not. It can also help valuation of a business basis forward looking cash flow for say next 4-5 years.

Outside the ambit of investment, it is used for project viability and assessment of risk of equity as well as private equity investment. Practically, it is applied in FEMA valuation of equity shares for purpose of transfer to non-resident or even under the Companies Act, 2013 for start ups or private placement, wherever this method works best in comparison to other methods.

### METHOD OF DISCOUNTED CASH FLOW VALUATION

DCF relies on the time value of money concept. Simply put, a rupee received today is more than same received after one year or say 5 years. The cash flows are discounted by a factor which is usually the weighted average cost of capital. Unlike measuring the costs of capital, the WACC takes the weighted average for each source of capital for which a company is liable. One can calculate WACC by applying the formula:

$WACC = [(E/V) \times Re] + [(D/V) \times Rd \times (1 - Tc)]$ , where:

E = equity market value

Re = equity cost

D = debt market value

V = the sum of the equity and debt market values

Rd = debt cost

Tc = the current tax rate

In order to do a DCF analysis, first we need to project free cash flow for a period of time (say, five years). Free cash flow equals EBIT less taxes plus D&A less capital expenditure less the change in working capital. This measure of free cash flow is unlevered or debt-free. This is because it does not include interest and so is independent of debt and capital structure.

Next we need a way to predict the value of the company/assets for the years beyond the projection period (5 years). This is known as the Terminal Value (Tvt). We can use one of two methods for calculating terminal value, either the Gordon Growth (also called Perpetuity Growth) method or the Terminal Multiple method. To use the Gordon Growth method, we must choose an appropriate rate by which the company can grow forever. This growth rate should be modest, for example, average long-term expected GDP growth or inflation. To calculate terminal value we multiply the last year's free cash flow (year 5) by 1 plus the chosen growth rate, and then divide by the discount rate less growth rate.

Now that we have our projections of free cash flows and terminal value, we need to "present value" these at the appropriate discount rate, also known as weighted average cost of capital (WACC). Finally, summing up the present value of the projected cash flows and the present value of the terminal value gives us the DCF value.

The second method, the Terminal Multiple method, is the one that is more often

used in banking. Here we take an operating metric for the last projected period (year 5) and multiply it by an appropriate valuation multiple. This most common metric to use is EBITDA. We typically select the appropriate EBITDA multiple by taking what we concluded for our comparable company analysis on a last twelve month (LTM) basis.

The DCF Valuation Formula There are three main parts to consider when doing a DCF valuation: the discount rate, the cash flows, and the number of periods. The formula for discounted cash flow is:

$$DCF = \frac{CF_1}{(1+r)^1} + \frac{CF_2}{(1+r)^2} + \frac{CF_n}{(1+r)^n}$$

Where:

$CF_1$  = Cash flow for the first period

$CF_2$  = Cash flow for the second period

$CF_n$  = Cash flow for "n" period

$n$  = Number of periods

$r$  = Discount rate

Components of the DCF Formula

### Cash Flow (CF)

Cash flow is any sort of earnings or dividends. These cash flows can include Turnover of the company as well as sale of part of its assets or any cash receipts pertaining to the business.

### Number of Periods (n)

The number of periods is however many years the cash flows are expected to occur. Normally 4-5 years cash flows are considered which may extend to 10 years.

### Discount Rate (r)

The discount rate is used to discount the future cash flows to the present value.

### FCFF v FCFE

Free cash flow to the firm (FCFF) and free cash flow to equity (FCFE) are the cash flows available to, respectively, all of the investors in the company and to common stockholders.

### EXAMPLE OF DISCOUNTED CASH FLOW VALUATION

Typically, the DCF method is applied in a matrix consisting of the estimated future cash flows for period n discounted at the WACC and either FCFE or FCFF method depending upon the end use requirements.

An example using Gordon Growth method is represented as under:-  
Future Projected Cash Flows



PARTICULARS	YEAR	2022-23	2023-24	2024-25	2025-26	2026-27
		1	2	3	4	5
EBIT		25,50,025	31,87,531	39,84,414	49,80,518	62,25,647
Less: Tax on EBIT @ 25%		6,37,506	7,96,883	9,96,104	12,45,129	15,56,412
Add: Depreciation		3,58,250	4,12,707	4,38,925	4,90,152	5,14,940
Enterprise Level Operating Cash Flow		22,70,769	28,03,355	34,27,236	42,25,540	51,84,175
Less: Capital Expenditure		5,19,842	10,00,000	5,00,000	20,00,000	10,00,000
Less: Increase in NWC other than cash		50,000	1,50,000	2,51,000	2,71,000	3,00,000
Free cash flow to firm(FCFF)		17,00,927	16,53,355	26,76,236	19,54,540	38,84,175
Net present value of projected free cash flows	Net Present Value of (WACC) sum of all projected free cash flows	14,04,598	11,27,454	15,07,035	9,08,887	14,91,526
TVT						1,34,40,720
Terminal Free Cash Flow to COMPANY		51,61,244				
Enterprise value		1,16,00,745				

#### ASSUMPTIONS

Enterprise Value	21.10%
Cost of Equity	25.00%
Growth rate	10.00%

VALUATION OF SHARES	
Enterprise Value:	1,16,00,745
Less: Existing Debts:	10,25,000
Equity Value:	1,05,75,745
Assumptions	
Cost of equity	25.00%
Cost of Debt	13.00%
Post-tax cost of Debt	9.75%
Debt:total funds	25.59%
Tax Rate	25.59%
WACC	21.10%
Terminal FCF growth	10.00%
No. of shares	2,98,000
Per share value	35.49

### CONCLUSION:-

The use of this method is widespread and in accordance with the International Valuation Standards (IVS). The section on the Income Approach highlights the key steps and guidelines for the Discounted Cash Flow (DCF) Method including sections on the type of cash flow, explicit forecast period, cash flow forecasts, terminal value, the Gordon growth model/constant growth model, market approach/exit value, salvage value/disposal cost and discount rates. The three most commonly used methods for calculating a terminal value are: (a) Gordon growth model/constant growth model (appropriate only for indefinite-lived assets), (b) market approach/exit value (appropriate for both deteriorating/finite-lived assets and indefinite-lived assets). The constant growth model assumes that the asset grows (or declines) at a constant rate into perpetuity.

