Understanding The Discounted Cash Flow Formula

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- On the face of it the DCF Formula looks quite daunting but we are going to break it down to make it easier to understand

Understanding The Discounted Cash Flow Formula

- DCF Formula
  - The sum of the future cash flow in each period divided by 1 + the discount rate (WACC) raised to the power of the number of the period
  - Plus the Terminal Value similarly discounted to the present by the power of the number of the period

Understanding The Discounted Cash Flow Formula

- Cash Flow = CF
- r = Interest Rate
- n = number of periods
- TV = Terminal Value

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

Understanding The Discounted Cash Flow Formula

- Cash Flow (CF) is the cash generated by the asset in each period
- When conducting a DCF valuation on a company, we use the unlevered Free Cash Flow
- This is the Free Cash Flow assuming the company has no debt, also known as the UFCF and the Free Cash Flow to the Firm, FCFF

Understanding The Discounted Cash Flow Formula

- The discount rate (r) is the rate by which we discount the cash flows to the present day value
- When valuing a company we use the company's weighted average cost of capital - WACC

Understanding The Discounted Cash Flow Formula

- The Period Number (n) is the time period of the cash flows, typically years, sometimes months
- Note that if using months the discount rate needs to be adjusted to reflect this shorter time period

Understanding The Discounted Cash Flow Formula

- The Terminal Value (TV) is the value of the cash flows beyond the five period (year) projection
- This is because after the 5 year period of a model, the future values become increasingly difficult to estimate based on the assumptions in the model

Understanding The Discounted Cash Flow Formula

- There are two ways to arrive at the Terminal Value
- Exit Multiple (EBITDA multiple) where it is assumed the business is sold for this multiple of earnings
- Perpetual Growth Model - which assumes perpetual growth into the future.

Understanding The Discounted Cash Flow Formula

Period n	1	2	3	4	5	TV
Cash Flow CF	$200	$200	$200	$200	$200	$600
$\frac{1}{(1+r)^n}$	$\frac{1}{(1+r)}$	$\frac{1}{(1+r)^2}$	$\frac{1}{(1+r)^3}$	$\frac{1}{(1+r)^4}$	$\frac{1}{(1+r)^5}$	$\frac{1}{(1+r)^5}$

Understanding The Discounted Cash Flow Formula

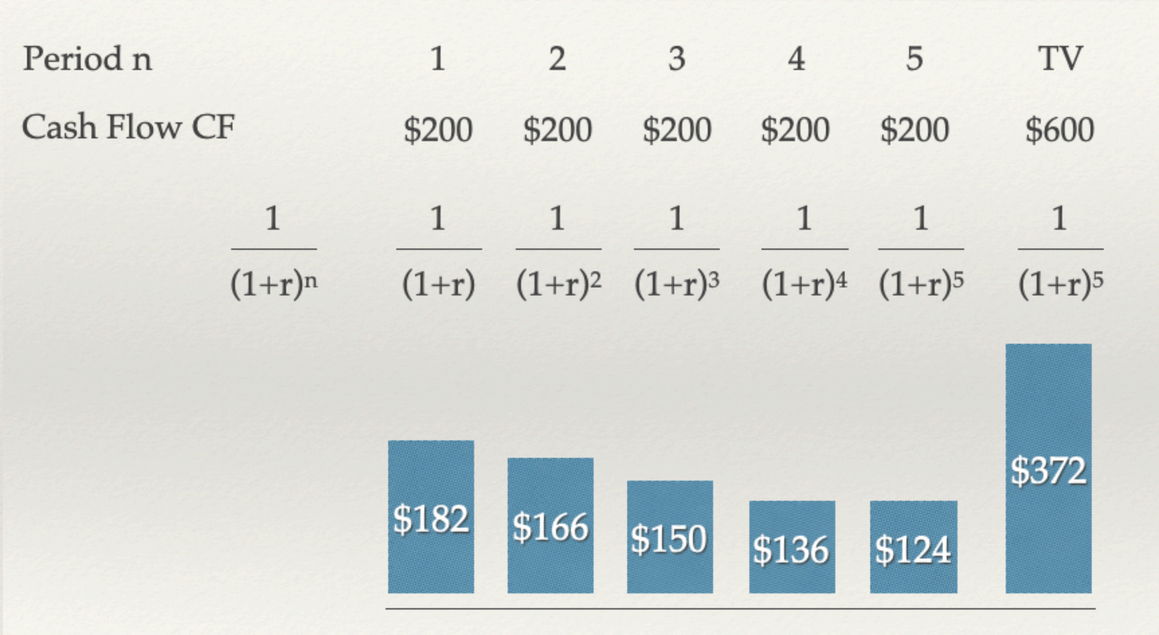
- This means that the present value of a cash flow reduces over time as the discount rate is applied

Understanding The Discounted Cash Flow Formula

Period n	1	2	3	4	5	TV
Cash Flow CF	$200	$200	$200	$200	$200	$600
$\frac{1}{(1+r)^n}$	$\frac{1}{(1+r)}$	$\frac{1}{(1+r)^2}$	$\frac{1}{(1+r)^3}$	$\frac{1}{(1+r)^4}$	$\frac{1}{(1+r)^5}$	$\frac{1}{(1+r)^5}$

Understanding The Discounted Cash Flow Formula

- When we total the Discounted cash flow we arrive at a DCF Enterprise value of $1,130m



Understanding The Discounted Cash Flow Formula

- The DCF value is also referred to as the Net Present Value
- The sum of all negative and positive cash flows discounted to the present

Understanding The Discounted Cash Flow Formula

- In Excel you can use the NPV() function, input the discount rate and specify the range of cells containing the FCF and Terminal to arrive at an Enterprise Value
- This is then adjusted for Cash and Debt to arrive at an Equity value

- NPV Formula
  - NPV(Discount rate, series of cash flows)
- Time Adjusted NPV Formula
  - XNPV(Discount rate, series of cash flows, dates of cash flows)

Understanding The Discounted Cash Flow Formula

- The Net Present Value tells you how much to pay in order to make a rate of return equal to the discount rate.
- If you pay more, your return will be less than the discount rate
- If you pay less, you will exceed that rate of return

Understanding The Discounted Cash Flow Formula

- In the context of a company valuation, the value is based on the cost of the company's capital - WACC.
- This takes into account the blended cost of capital for each type of capital in the company's capital structure
- It is also used as a hurdle rate by the company when evaluating investment or acquisition opportunities

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