A Simple Model

A Basic Discounted Cash Flow Model

NOTES TO ACCOMPANY VIDEOS

These notes are intended to supplement the videos on ASimpleModel.com. They are not to be used as stand-alone study aids, and are not written as comprehensive overviews of the topic detailed. The purpose of these notes is to provide a tangible collection of the visuals used in the videos with comments highlighting the more important aspects covered.
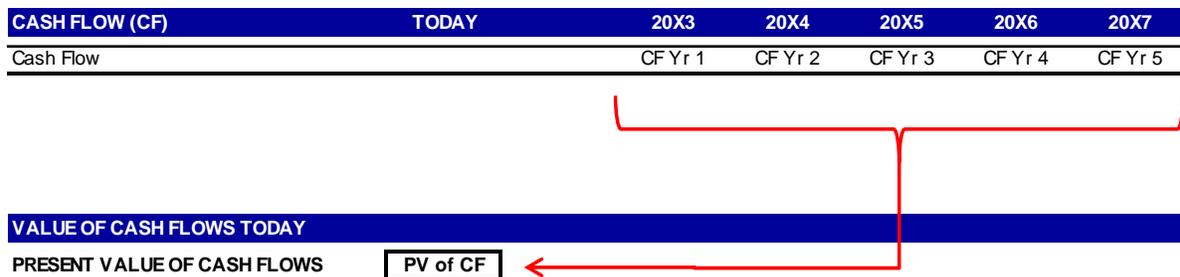
This video opens with an explanation of the objective of a discounted cash flow ("DCF") model:

- Essentially what you are doing is projecting the cash flows of a company, project or asset, and determining the value of those future cash flows today.

- DCF analysis is focused on the Time Value of Money.
  - Time Value of Money: A certain amount of money today has greater buying power today than the same amount of money in the future.

Discounted Cash Flow Analysis

CASH FLOW (CF)	TODAY	20X3	20X4	20X5	20X6	20X7
Cash Flow		CF Yr 1	CF Yr 2	CF Yr 3	CF Yr 4	CF Yr 5

VALUE OF CASH FLOWS TODAY						
PRESENT VALUE OF CASH FLOWS	PV of CF					

- PRESENT VALUE: The value of projected cash flows today.
  - Present value is determined by your cost of capital.

To better illustrate the "cost of capital" concept, the video provides an example in which you are asked to think about the yield you would require to forgo receipt of $1M today, and instead wait one year:

Lets assume you have a choice between...

Now	One Year From Now	Cost of Capital
$1,000,000	$1,000,000	0%
	$1,005,000	0.5%
	$1,050,000	5%
	$1,500,000	50%

You want to be compensated for the 1 year delay

RISK
- Risk-Free Rate   compensation required for the delay
- Risk Premium   compensation required because cash flow might not materialize

It follows that cost of capital is determined by the yield an investor requires to be compensated for time and risk.

- In this video, to simplify the exercise and focus on the mechanics of building a model, we assume a cost of capital of 10%.

- This cost of capital is applied to the projected cash flows of a boat (asset).

This boat. ⟶
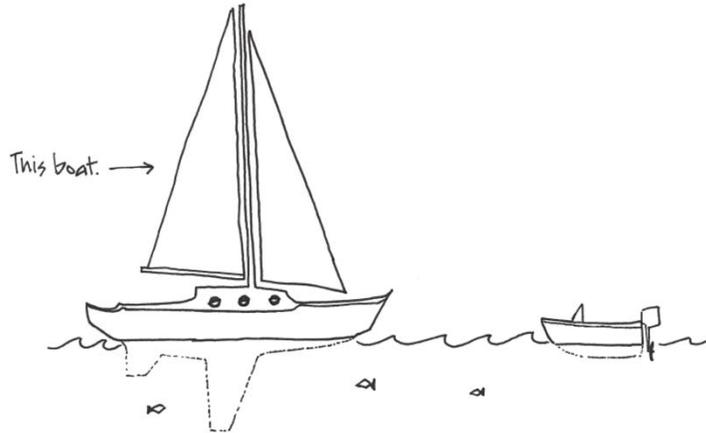
Disclaimer: A Simple Model does not advise buying a boat to fund retirement.

This is a terrible plan. (see depreciation)

To determine the present value ("PV") of the projected cash flows the concept of a discount factor is introduced:

- DISCOUNT FACTOR: The calculation used to discount the value of projected cash flows to determine present value.

$$Discount\ Factor = \frac{1}{(1+[Cost\ of\ Capital])^{\wedge\ (year)}}$$

$$Present\ Value = Discount\ Factor * Cash\ Flow$$

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In the video a highly unrealistic assumption is made: that the cash flows generated by renting a boat to tourists will be consistent year over year. While unrealistic, it makes it easier to see the effect that time has on the value of projected cash flows.

- In the template below you can see the same projected cash flow for each year, and how a 10% cost of capital affects the value of those cash flows in the PV calculation.

- It also makes it easy to demonstrate that the value determined using Terminal Value is equivalent to the value realized if you project the cash flows of the boat far enough in to the future (see video).

Discounted Cash Flow Analysis

CASH FLOW (CF)	20X3	20X4	20X5	20X6	20X7
Boat Revenue	750,000	750,000	750,000	750,000	750,000
Less:					
Boat Expenses	500,000	500,000	500,000	500,000	500,000
Boat Cash Flow	250,000	250,000	250,000	250,000	250,000

COST OF CAPITAL		
Cost of Capital	10.0%	

PRESENT VALUE OF CASH FLOWS (PV of CF)	20X3	20X4	20X5	20X6	20X7
	Year 1	Year 2	Year 3	Year 4	Year 5
Discount Factor	0.91	0.83	0.75	0.68	0.62
Present Value of Cash Flows	227,273	206,612	187,829	170,753	155,230

TERMINAL VALUE (CASH FLOW OF BOAT IN PERPETUITY)	
Cost of Capital	10.0%
Growth Rate in Perpetuity	0.0%
Terminal Value	2,500,000

BOAT VALUE: PERPETUITY GROWTH RATE METHOD						
	PV of CF		PV of Terminal Value		BOAT	
Boat Value	947,697	+	1,552,303	=	2,500,000	

CONCLUSION:

This boat is worth $2.5M TODAY based on this analysis of its future cash flows.

You would be willing to purchase this boat for $2.5M with a cost of capital of 10% because it cash flows $250,000 every year ($2.5M * 10% = $250,000).

TERMINAL VALUE: because it would be difficult to accurately project cash flows beyond five years, a calculation for terminal value known as the Gordon Growth Model is employed (see video).

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