

AI-POWERED FINANCIAL RESEARCH WITH PERPLEXITY · SPECIALIZATION



Discounted Cash Flow (DCF) Models

Calculate DCF Models Beginner 1.5 hours



COURSE: Advanced Financial Modeling & Risk Valuation

CATEGORY: Financial Analysis

OCCAM'S FORENSIC JURY™ · *Follow the Cash. Not the Noise.*



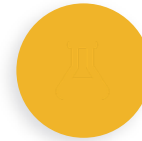
What you'll be able to do



UNDERSTAND

Read the anatomy of a DCF model

Explain the building blocks — forecast free cash flow, discount rate, terminal value, and present-value mechanics — and how model structure links your assumptions to the valuation output.



APPLY

Build a basic DCF yourself

Run a DCF calculation using short-horizon cash-flow projections and a stated discount rate for a single company, laid out in a structured spreadsheet model.



How we'll spend the session



The core idea

Why a business is worth its future cash — discounted to today **10 min**



The five building blocks

FCF, discount rate, terminal value, PV mechanics, model structure **30 min**



Build a DCF (worked example)

A single company, short-horizon, in a structured spreadsheet **30 min**



Source inputs with Perplexity

AI-assisted research — and the cite-or-verify discipline **15 min**



Pitfalls & takeaways

Sanity checks that keep a model honest **5 min**



PART 1

Understand

The anatomy of a DCF model — what each piece does and how they connect.

A company is worth the cash it will produce

A DCF estimates **intrinsic value**: the present value of every dollar of free cash flow a business is expected to generate, discounted back to today. Cash that arrives later is worth less now — so we shrink it.

“Follow the Cash. Not the Noise.”

Earnings can be shaped by accounting choices. Cash is harder to fake — which is why DCF starts there.

Cash today > the same cash later



Present value of \$1 received in each year (discounted at ~9%).

The five building blocks

1



Forecast Free Cash Flow

The cash a company keeps after running and reinvesting in itself.

2



Discount Rate

The return required to compensate for time and risk.

3



Terminal Value

Everything beyond the explicit forecast window.

4



Present-Value Mechanics

Shrinking each future cash flow back to today's dollars.

5



Model Structure

How assumptions flow through drivers to the valuation output.

1 Forecast Free Cash Flow

Free cash flow (FCF) is the cash a business has left *after* it pays to operate and to reinvest. It's what owners could actually take out — the raw material of value.

- ✓ Start from operating cash flow, then subtract capital expenditures.
- ✓ Project a short horizon (often 5 years) using a growth assumption.
- ✓ Beginner rule: keep growth modest and defensible — not heroic.

The simple formula

FCF = Operating Cash Flow – Capital Expenditures

Each forecast year:

$$\text{FCF}_t = \text{FCF}_{t-1} \times (1 + g)$$

g = your assumed annual growth rate for cash flow.



2 Discount Rate

The discount rate is the annual return an investor requires to be compensated for **waiting (time)** and for **uncertainty (risk)**. A higher rate means future cash is worth less today.

- ✓ At beginner level, use a stated rate (e.g., 8–12%) rather than deriving it.
- ✓ Riskier, less predictable companies warrant a higher rate.
- ✓ Small rate changes move the answer a lot — handle with care.

What the rate represents

r = required return

Advanced courses derive r from WACC — the blended cost of a company's debt and equity. For this module, the rate is **given to you** so you can focus on the mechanics.

WACC = Weighted Average Cost of Capital (covered later).

3 Terminal Value

You can't forecast forever. Terminal value (TV) captures every cash flow *beyond* your explicit window, collapsed into a single number at the end of the forecast.

- ✓ Gordon-growth method: assume cash grows at a slow, perpetual rate.
- ✓ Terminal growth (g) should be low — at or below long-run GDP.
- ✓ TV is then discounted back like any other future cash flow.

Gordon-growth terminal value

$$\frac{TV_n = FCF_n \times (1 + g)}{(r - g)}$$

where r = discount rate and g = perpetual growth rate.

Watch out: TV often drives most of the valuation.

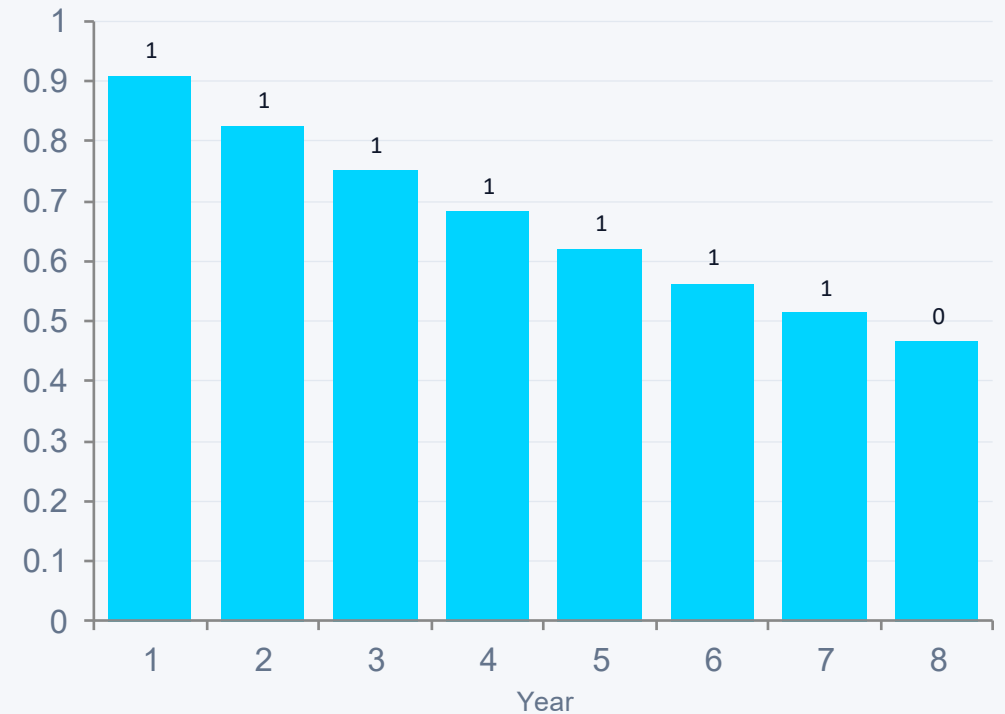
4 Present-Value Mechanics

Discounting turns a future dollar into today's dollars. Divide each cash flow by **(1 + r) raised to its year number**. The further out the cash, the smaller its present value.

$$PV = CF_t \div (1 + r)_t$$

The $(1 + r)^t$ part is the discount factor — multiply, and a Year-5 dollar at 10% is worth about 62¢ today.

Discount factor by year (at $r = 10\%$)



5 Model Structure

A good model makes its logic visible. Assumptions feed drivers, drivers produce cash flows, and cash flows roll up to a value. Change one assumption and the output should update — cleanly and traceably.

STEP 1

Assumptions

Growth, discount rate, terminal g — in one place, clearly labeled.



STEP 2

Drivers

Formulas turn assumptions into each year's projected free cash flow.



STEP 3

Valuation Output

PV of cash flows + PV of terminal value
= intrinsic value.



PART 2

Apply

Build a basic DCF for a single company — short horizon, stated discount rate, structured spreadsheet.



A five-year DCF, start to finish

BASE FCF: **\$120M**
 GROWTH (G): **8% / yr**
 DISCOUNT RATE (R): **10%**
 TERMINAL GROWTH: **3%**

Year	FCF (\$M)	Discount factor @10%	Present Value (\$M)
1	120.0	0.909	109.1
2	129.6	0.826	107.1
3	140.0	0.751	105.2
4	151.2	0.683	103.2
5	163.3	0.621	101.4
TV	2402	0.621	1491.6

INTRINSIC VALUE

≈ **\$2.02B**

PV of forecast cash flows (\$526M) + PV of terminal value (\$1492M)

Same machinery every time: project cash → discount each year
→ add the terminal value → sum. Swap in a real company's numbers and the model does the rest.



Lay it out so anyone can follow it

A structured model separates what you assume from what the model calculates. Three labeled blocks, top to bottom:

1 · Assumptions

- Base-year FCF
- Growth rate (g)
- Discount rate (r)
- Terminal growth

2 · Projection

- One column per year
- $FCF_t = FCF_{t-1} \times (1+g)$
- Discount factor row
- $PV = FCF \div \text{factor}$

3 · Valuation

- Sum of yearly PVs
- Terminal value + its PV
- Add for intrinsic value
- Compare vs. price

Tip: keep every input in the Assumptions block — never bury a number inside a formula.

Source your inputs with Perplexity

DCF is only as good as its inputs. Use Perplexity to gather them fast — then **verify against the filing**. Treat AI answers as leads, not citations.

"List [TICKER]'s operating cash flow and capex for the last 5 fiscal years, with the 10-K source for each."

"What free cash flow growth rate have analysts assumed for [TICKER]? Cite sources."

"Summarize risks that could change [TICKER]'s cash generation over the next 5 years."



Cite-or-verify discipline

- Open the primary source Perplexity links to and confirm the number.
- Pull cash figures from the cash-flow statement, not summaries.
- Log where every input came from — your model should be auditable.
- If a figure can't be sourced, don't use it.

Cite-or-verify discipline for ALL LLMs

In June 2023, a New York attorney named **Steven Schwartz** filed a 10-page legal brief in *Mata v. Avianca* — a routine personal-injury case against an airline. Schwartz had been practicing law for **30 years**. To save research time, he asked ChatGPT to find supporting case law for his arguments.

ChatGPT delivered. It gave him six cases with full citations: case names, docket numbers, courts, judges, page numbers. He copied them into his brief and filed it.

There was just one problem: **none of the cases existed**. ChatGPT had fabricated all six. *Varghese v. China Southern Airlines*. *Shaboon v. EgyptAir*. *Martinez v. Delta Air Lines*. *Estate of Durden v. KLM*. *Miller v. United Airlines*. *Petersen v. Iran Air*. Real-sounding parties. Real-sounding citations. Zero real cases.

Opposing counsel couldn't find any of them. Neither could the judge. So the judge ordered Schwartz to produce copies of the opinions he had cited.

And here's the part that lives forever. Schwartz went back to ChatGPT and asked it whether the cases were real. ChatGPT said yes. He asked for the full text. ChatGPT generated plausible-looking opinions. Schwartz filed **those** as exhibits — screenshots of ChatGPT confirming its own hallucinations as proof the cases were real.

Where DCFs go wrong



Garbage in, garbage out

Unrealistic growth quietly inflates the whole answer.



Terminal value dominance

If most of the value sits in TV, your perpetual growth assumption is doing the heavy lifting.



Discount-rate sensitivity

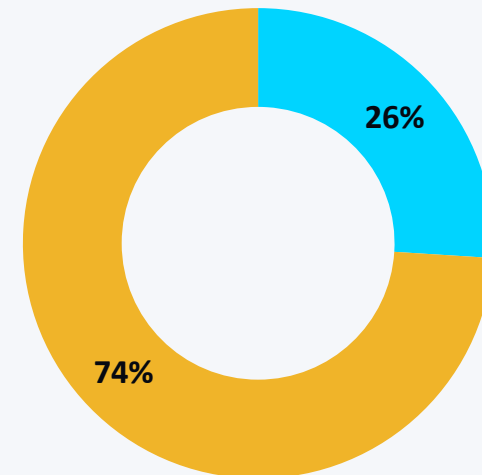
A 1-point change in r can swing value double digits — always test a range.



False precision

A DCF is a reasoned estimate, not a price target. Use ranges.

Our worked example: where does the value come from?



■ Explicit FCF (5 yrs) ■ Terminal value

~74% from terminal value — a classic reason to stress-test it.

ARK Invest Open Source Valuation models



Garbage in, garbage out

Unrealistic growth quietly inflates the whole answer.

<https://github.com/arkinvest/ark-invest-tesla-valuation-model?>



Terminal value dominance

If most of the value sits in TV, your perpetual growth assumption is doing the heavy lifting.



Discount-rate sensitivity

A 1-point change in r can swing value double digits — always test a range.



False precision

A DCF is a reasoned estimate, not a price target. Use ranges. Last year, ARK estimated that in 2024 Tesla's share price would hit \$7,000 per share, or \$1,400 adjusted for its five for one stock split. Based on our updated research, we now estimate that it could approach \$3,000 in 2025.

To arrive at this forecast, ARK used a [Monte Carlo](#) model with 34 inputs, the high and low forecasts incorporating 40,000 possible simulations. Our bull and bear price targets are the top and bottom quartile outcomes from the simulations, as shown below:

What you can now do



UNDERSTAND

Name and explain the five building blocks

FCF, discount rate, terminal value, PV mechanics, and how structure links assumptions to value.



APPLY

Build a basic DCF for one company

Project short-horizon cash flow, discount it, add terminal value, and read out an intrinsic value.



RESEARCH

Gather inputs with Perplexity — and verify them

Use AI to move fast, but anchor every number to a primary source.



Disclosures

- This material is educational and for general information only. It is not investment, financial, legal, or tax advice, and it is not a recommendation to buy or sell any security.
- Worked examples use hypothetical figures to illustrate mechanics. They do not represent any specific company or a forecast of actual results.
- A DCF is a model built on assumptions; small changes in inputs can materially change the output. Always do your own research and consider consulting a licensed professional.
- Occam's Forensic Jury publishes general financial education under the publisher's exemption. No personalized advice is provided.

“Follow the Cash. Not the Noise.”

You've built the muscle for valuation by cash flow. Next: derive the discount rate (WACC) and run a reverse DCF to see the growth the market is already pricing in.

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