CHARTA LEARNING · LESSON NOTES

Projecting free cash flow

Equity Investments

1 A story: forecasting next year's cash

- Free cash flow = cash left after investing
- FCFF belongs to all investors, FCFE to owners
- Lazy way: grow last year's figure
- Better way: forecast what drives it

IN THE LESSON

- Imagine you are asked what a market stall will have left over next year, after paying for stock, the van and the new fridge.
- One lazy answer is to take this year's leftover and add a few per cent.
- Another is to ask what will actually change.
- Will customers grow, will costs rise, will the van need replacing?
- Analysts face exactly this choice with free cash flow.
- Free cash flow to the firm, F C F F, is the cash left for all investors after running and investing in the business.
- Free cash flow to equity, F C F E, is what is left for shareholders alone, after lenders are paid.

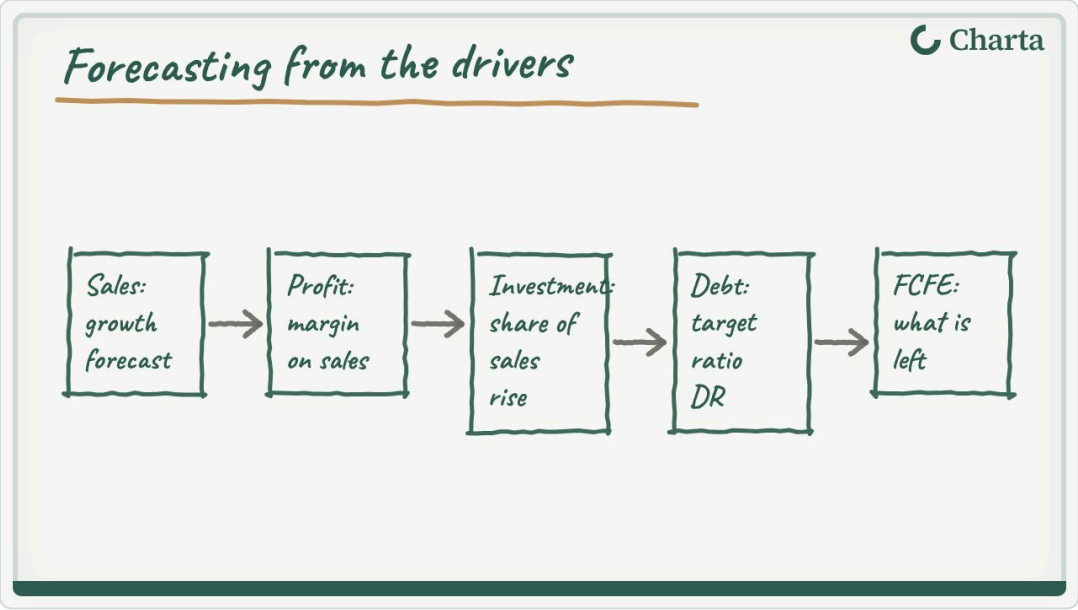
2 Two ways to project

- Simple: grow latest FCF at a constant rate
- It assumes all the relationships stay fixed
- Detailed: forecast sales, margin, investment
- Investment is tied to the increase in sales

IN THE LESSON

- Here are the two methods.
- The simple one takes the latest free cash flow and grows it at a constant rate.
- It is quick, and for a steady, mature business it can be fine.
- But notice what it assumes.
- Sales, margins, spending on equipment and spending on stock all keep their present relationship for ever.
- The detailed method forecasts the pieces.
- Sales growth is a view on the market.
- A margin turns sales into profit.
- Fixed capital and working capital investment are set as a percentage of the increase in sales, because a firm that sells more needs more capacity.
- That detail is why the second method is trusted when a firm is changing.

3 Forecasting from the drivers



IN THE LESSON

- Let's draw the detailed method as a chain.
- It starts on the left with sales, where you forecast a growth rate.
- Sales turn into profit through a margin.
- Now comes the link that the simple method throws away.
- Investment in fixed assets and working capital is set as a percentage of the increase in sales.
- For free cash flow to equity there is one more box.
- The company aims for a target debt ratio, written D R, and lenders fund that share of the net new investment.
- Shareholders fund the rest out of earnings.
- What is left at the right hand end is free cash flow to equity.
- You can argue with every box separately, and that is the great strength of this method.

4 FCFE with a target debt ratio

FCFE = NI − (1 − DR)(FCInv − Dep) − (1 − DR) WCInv

NI: net income	Start from the profit
DR: debt ratio	Share lenders fund
FCInv − Dep	Net capital spending
WCInv	Working capital added
FCFE	Cash left for owners

IN THE LESSON

- Here is the formula for the equity version.
- Free cash flow to equity equals net income, minus one minus D R times fixed capital investment less depreciation, minus one minus D R times working capital investment.
- Read it slowly.
- Start with net income.
- Fixed capital investment minus depreciation is net capital spending, only the spending above what wear and tear already covers.
- Working capital investment is extra money tied up in stock and customers owing.
- Lenders supply D R of that net investment, so shareholders supply one minus D R.
- Depreciation never appears separately, because it was added back in full and already pays for replacement.

5 Example: Brightwater's forecast

Brightwater, millions, next year

Sales	1,000 to 1,100	**+100**
Net income	8% × 1,100	**88**
Net capital spending	70 − 40 depreciation	**30**
Working capital	10% × 100 sales rise	**10**
Target debt ratio	lenders fund 40%	**DR = 0.4**

IN THE LESSON

- Meet Brightwater Packaging, a made up company.
- An analyst, Maya, forecasts one year ahead.
- Sales are expected to rise from one thousand to one thousand one hundred, a rise of one hundred.
- Net income will be eight per cent of the new sales, which is eighty eight.
- Capital spending will be seventy and depreciation forty, so net capital spending is thirty.
- Working capital investment is ten per cent of the sales increase, which is ten.
- The company keeps debt at forty per cent of its funding, so the target debt ratio is zero point four.
- Next we put these into the formula.

6 Example: FCFE, and the trap

FCFE = 88 − 0.6 × 30 − 0.6 × 10

Equity share of net capex	0.6 × 30	**18**
Equity share of WCInv	0.6 × 10	**6**
FCFE	88 − 18 − 6	**64**
Gross capex by mistake	88 − 0.6 × 70 − 6	**40**
Check the long way	88 + 40 − 70 − 10 + 16	**64**

IN THE LESSON

- Now the calculation.
- One minus the debt ratio is zero point six, the share shareholders fund.
- Zero point six times thirty is eighteen.
- Zero point six times ten is six.
- So free cash flow to equity is eighty eight, minus eighteen, minus six, which is sixty four.
- Check it the long way.
- Eighty eight plus depreciation forty, minus capital spending seventy, minus working capital ten, gives forty eight.
- Add borrowing of forty per cent of the forty of net investment, which is sixteen, and you reach sixty four again.
- Now the trap.
- Put in gross spending of seventy instead of net thirty, and you get forty.
- That overstates the equity funding needed and understates the cash flow.

7 Same forecast, the firm's view

Interest 16, tax 25%: the firm's cash flow

After-tax interest	16 × (1 − 0.25)	**12**
Profit before financing	88 + 12	**100**
FCFF	100 + 40 − 70 − 10	**60**
Net borrowing	0.4 × (30 + 10)	**16**
FCFE	60 − 12 + 16	**64**

IN THE LESSON

- The same forecast gives free cash flow to the firm.
- Suppose Brightwater pays sixteen of interest, and tax is twenty five per cent.
- After tax interest is sixteen times zero point seven five, which is twelve.
- Add that back to net income of eighty eight and you get one hundred, the operating profit after tax.
- Add depreciation of forty, subtract capital spending of seventy and working capital of ten, and free cash flow to the firm is sixty.
- Now bridge to equity.
- Net borrowing is zero point four times forty, which is sixteen.
- Sixty, minus twelve of after tax interest, plus sixteen of borrowing, gives sixty four.
- Both routes agree, which is a good habit to check.

8 Choosing the method

Match the method to the company

Situation	Method
Steady, mature firm	One growth rate
Changing growth or margins	Components
Managed leverage	Target DR
Capex in the DR formula	Net of dep.

IN THE LESSON

- Let's pull the choice together in a small table.
- Growing last year's cash flow at one rate suits a mature firm whose growth, margins and investment needs are steady.
- Forecasting the components suits a firm whose growth or margins are about to change, because the link between sales and investment stays visible.
- Using a target debt ratio suits a firm that manages its leverage deliberately, since it lets you forecast borrowing without guessing each loan.
- The exam trap is the one we met.
- Use capital spending net of depreciation in the target ratio formula, never the gross figure, or you overstate the equity financing and get the wrong cash flow.

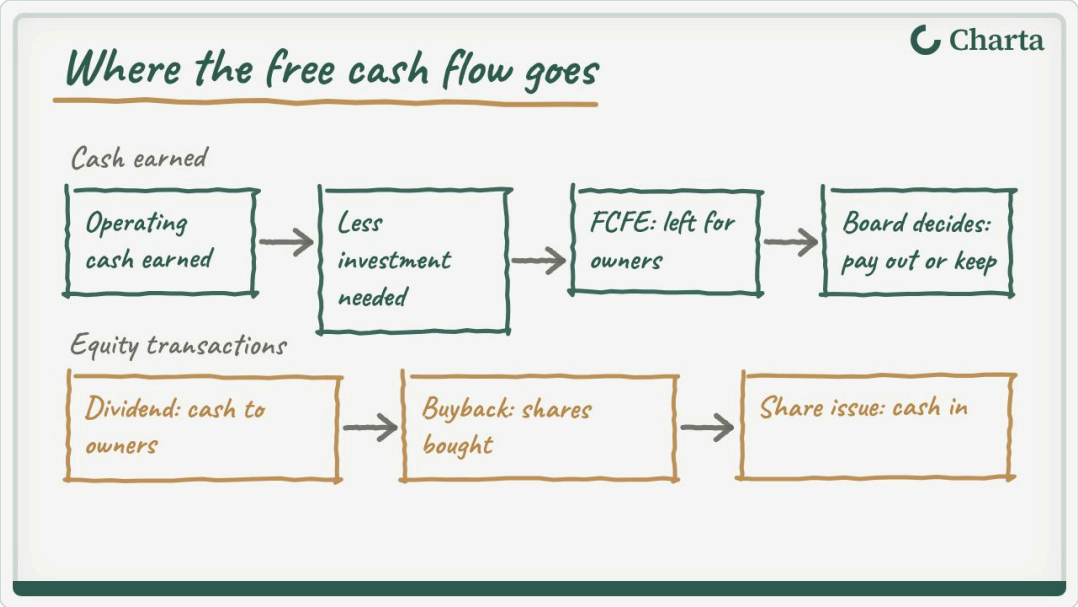
9 Moving cash, not making it

- Dividends: cash paid out to owners
- Buybacks: cash used to buy shares back
- Share issues: cash brought in from owners
- None of these create or destroy FCF

IN THE LESSON

- Now to the second idea.
- Think of a family with one household budget.
- Whether the parents give pocket money, buy a new sofa or pay back a loan, the family did not earn anything new by choosing.
- Free cash flow is the earned amount, and what happens next is a choice about who gets it.
- A dividend pays cash to shareholders.
- A buyback uses cash to purchase their shares.
- A new share issue brings cash in from them.
- Each of these is a transaction between the company and its owners.
- Both free cash flow to the firm and free cash flow to equity are measured before any such transaction, so none of them changes the flows.

10 Where the free cash flow goes



IN THE LESSON

- Follow the boxes.
- The business first earns its operating cash and pays for the investment it needs.
- What remains for shareholders is free cash flow to equity.
- Now the board decides what to do with it.
- It can pay a dividend, buy back shares, or keep the cash.
- The second row lists the equity transactions: a dividend, a buyback, and a share issue, which runs the other way, because investors hand over cash and the company uses it.
- Notice that the decision boxes sit after the free cash flow box.
- The cash was already measured.
- This is why a bigger dividend does not mean lower free cash flow to equity, and a buyback does not make it smaller either.

11 Leverage is different

- New loan: FCFE rises in the year it arrives
- Later years: interest and repayment lower FCFE
- FCFF is largely unaffected by financing
- Tax saving on debt sits in the WACC

IN THE LESSON

- Debt is different, because borrowing involves lenders, not only owners.
- When a company takes a new loan, free cash flow to equity rises in that year, since net borrowing is part of the formula.
- But the loan carries interest, and one day it must be repaid.
- So in later years free cash flow to equity falls, through the extra interest and the repayment.
- Free cash flow to the firm is measured before payments to lenders, so a change in financing leaves it largely alone.
- The tax saving on interest does not show in that flow.
- It shows up in the discount rate, the weighted average cost of capital.
- So a one off loan is a loan, not a lasting gain.

12 Example: borrow once, pay for years

FCFF 110 a year; borrow 200 at 6%; tax 25%

FCFF, every year	financing leaves it	**110**
FCFE, year 1	110 + 200 borrowed	**310**
After-tax interest	200 × 0.06 × 0.75	**9**
FCFE, years 2 to 4	110 − 9	**101**
FCFE, year 5	101 − 200 repaid	**−99**

IN THE LESSON

- Here is a five year case.
- A made up firm has free cash flow to the firm of one hundred and ten every year and no debt.
- At the end of year one it borrows two hundred at six per cent, tax is twenty five per cent, and it repays in year five.
- Free cash flow to the firm stays one hundred and ten throughout.
- Free cash flow to equity in year one is one hundred and ten plus two hundred, which is three hundred and ten.
- After tax interest is two hundred times zero point zero six times zero point seven five, which is nine.
- So in years two to four, free cash flow to equity is one hundred and one.
- In year five, repaying two hundred makes it minus ninety nine.

13 The spike is borrowing, not business



IN THE LESSON

- Now the picture.
- Each bar is free cash flow to equity in one year, in millions.
- Year one stands tall at three hundred and ten.
- But the business has not changed.
- Free cash flow to the firm was one hundred and ten in every year, and the extra two hundred is lenders money passing through.
- The next three bars are lower, at one hundred and one, because of the nine a year of after tax interest.
- Year five, not drawn, is minus ninety nine.
- Add the five years up and the total is five hundred and fourteen, which is thirty six less than five times one hundred and ten.
- The borrowing brought cash forward and charged interest for it.

14 What changes the flows

Effect on free cash flow

Event	Effect
Dividend or buyback	None
New share issue	None
New borrowing: FCFE	Up, then down
New borrowing: FCFF	Little change

IN THE LESSON

- Here is the summary, event by event.
- A dividend leaves both flows unchanged.
- A buyback leaves both unchanged.
- A new share issue leaves both unchanged.
- These are uses or sources of equity finance, measured after the flows.
- New borrowing is the exception.
- It lifts free cash flow to equity now and lowers it later, through interest and repayment.
- Free cash flow to the firm hardly moves.
- After a debt funded buyback there are fewer shares and more debt, so value per share and the cost of equity change.
- But that works through the share count and the discount rate, not through the cash flow.
- The two traps are treating a dividend as lowering the flow, and a one off loan as a lasting boost.

15 Two ways to value the owners' stake

- Both discount at the required return on equity
- Both can be single or multistage
- DDM discounts dividends actually paid
- FCFE discounts the capacity to pay

IN THE LESSON

- Think about a landlord.
- One way to value the rental flat is to count the rent that actually reaches your bank account.
- Another is to count everything the flat could pay you after repairs, if you chose to take it all.
- The first is a dividend discount model.
- The second is the free cash flow to equity model.
- Both discount a flow to shareholders at the required return on equity, and both can be single stage or multistage.
- The difference is only the cash flow.
- Dividends are what shareholders actually receive, and the board sets them.
- Free cash flow to equity is the capacity to pay, after investment and net borrowing.

16 The same formula, two cash flows

V0 = Next flow ÷ (r − g)

V0: value today	What the share is worth
Next flow	D1 for DDM, FCFE1 for FCFE
r: required return	Return equity investors need
g: growth rate	Growth for ever, below r

IN THE LESSON

- For a single stage, constant growth case, both models use the same shape.
- Value today equals next year's flow, divided by the required return minus the growth rate.
- In the dividend model, the flow is the dividend expected next year.
- In the free cash flow to equity model, it is the free cash flow to equity expected next year.
- The required return is the return equity investors demand, and growth is the rate at which the flow grows for ever, which must be below the required return.
- The engine is identical, so any difference in value comes from the cash flow you put in.
- That is the heart of this outcome.

17 Example: two companies, same cash

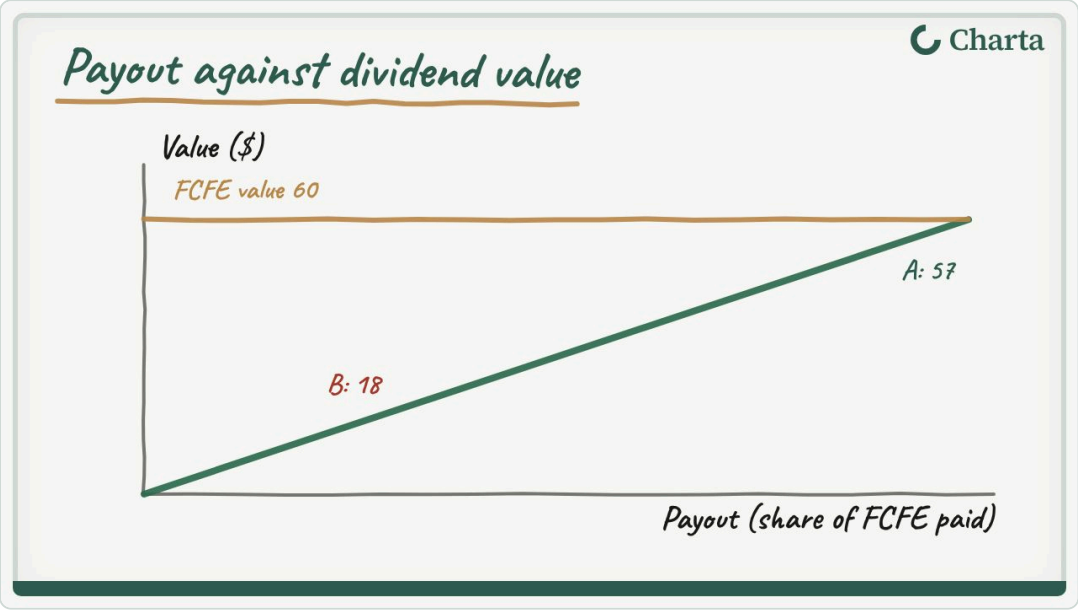
FCFE 3.00 a share, g = 5%, r = 10%

FCFE value, both	3.00 ÷ 0.05	**60.00**
A pays 2.85	2.85 ÷ 0.05	**57.00**
B pays 0.90	0.90 ÷ 0.05	**18.00**
Cash B retains	3.00 − 0.90	**2.10 a year**
Gap for B	60 − 18	**42.00**

IN THE LESSON

- Let's test it.
- Two made up companies, A and B, each expect free cash flow to equity of three dollars a share next year, growing at five per cent, with a required return of ten per cent.
- The free cash flow to equity value is three divided by zero point zero five, which is sixty dollars.
- Company A pays out two dollars eighty five.
- Its dividend value is two eighty five over zero point zero five, which is fifty seven.
- Close to sixty.
- Company B pays only ninety cents.
- Its dividend value is ninety cents over zero point zero five, which is eighteen.
- Same business, same cash, a gap of forty two dollars.
- The difference is the cash B keeps, two dollars ten a year.

18 Payout against dividend value



IN THE LESSON

- Here is the picture.
- Along the bottom is the share of free cash flow to equity the company pays out.
- Up the side is value per share.
- The flat gold line is the free cash flow to equity value, sixty dollars, which does not depend on payout.
- The rising green line is the dividend model value, which climbs with the payout, because the more cash reaches shareholders, the more the dividend model sees.
- Company A sits near the top right, close to the gold line, at fifty seven.
- Company B sits low on the green line, at eighteen.
- So when payout is close to the capacity to pay, the models agree.
- When payout is far below it, they do not.

19 Which model to use

- Payout near FCFE: models agree, DDM simpler
- Minority holder: DDM shows what is received
- Control or no dividend: FCFE is more useful
- FCFE can be negative and volatile

IN THE LESSON

- So which should you pick?
- When a company pays out roughly its free cash flow to equity, the two models give similar values, and the dividend model is simpler.
- When it pays far less, the dividend model suits a minority investor, who gets only what is paid and cannot make the board pay more.
- Free cash flow to equity shows what an owner who could change the payout might take out.
- It also works for a company that pays no dividend at all, where the dividend model has nothing to discount.
- The cost is that free cash flow to equity can be negative and volatile in years of heavy investment, so check how reliably each flow can be forecast.

20 Common mistakes so far

- Gross capex used in the DR formula
- A dividend or buyback lowers FCFE: no
- A one-off loan is a lasting FCFE rise: no
- Low payout means low value: not necessarily

IN THE LESSON

- Time to stop and collect the traps from this half of the lesson.
- One: using gross capital spending instead of capital spending net of depreciation in the target debt ratio formula.
- It overstates the equity financing needed.
- Two: thinking that a bigger dividend or a buyback lowers free cash flow to equity.
- It does not, because the flow is measured before payouts.
- Three: treating a one off loan as a lasting rise in free cash flow to equity, when later years pay for it with interest and repayment.
- Four: deciding that a low payout company is worth little, without asking what happens to the cash it retains.
- If it is reinvested well, the dividend model will catch up later.

21 Can profit stand in for cash?

- Net income: includes non-cash items
- It ignores capex, working capital and borrowing
- EBITDA also ignores tax and all investment
- Do they ever work as a stand-in for cash?

IN THE LESSON

- Many people skip free cash flow and use something easier.
- Net income is in the headlines, and E B I T D A, earnings before interest, tax, depreciation and amortization, is quoted in almost every deal.
- Why not value the company on those?
- Think of a friend who says they earn a large salary but never seems to have any money.
- Rent, a car loan and a house deposit take it all.
- Profit measures can look healthy while cash is being consumed.
- Net income includes non cash charges and gains, ignores investment in equipment and working capital, and ignores net borrowing.
- EBITDA also ignores tax, a very real payment.
- So we ask when, if ever, each is a safe stand in.

22 FCFF from EBITDA

FCFF = EBITDA(1 − t) + Dep × t − FCInv − WCInv

EBITDA(1 − t)	EBITDA after tax
Dep × t	Tax saved by depreciation
FCInv	Capital spending in cash
WCInv	Working capital invested
FCFF	Cash for all investors

IN THE LESSON

- To compare them, we need the formula that links E B I T D A to free cash flow to the firm.
- It reads: E B I T D A times one minus the tax rate, plus depreciation times the tax rate, minus fixed capital investment, minus working capital investment.
- The first term is E B I T D A after tax.
- The second adds back the tax saved because depreciation is deductible.
- Notice depreciation itself is not added back in full.
- Only its tax shield is.
- Then take off the real cash spent on equipment and on stock and customers.
- Every term after the first is a reason E B I T D A is not cash flow.

23 Example: a growing company

Millions, one year of rapid growth

EBITDA	before everything	**400**
Depreciation and interest	120 and 40	**160**
Capital spending	more than double dep.	**250**
Working capital invested	sales are growing	**60**
Net borrowing	new loans less repayments	**50**

IN THE LESSON

- Here is a growing, capital hungry company, made up for this lesson.
- It reports E B I T D A of four hundred million.
- Depreciation is one hundred and twenty and interest is forty.
- Tax is twenty five per cent on profit before tax.
- This year it spends two hundred and fifty on new equipment, which is more than double its depreciation.
- It also puts sixty into working capital, because sales are growing.
- To help fund this, it borrows a net fifty.
- Notice the figures.
- The company looks strong on every headline measure.
- Now let us convert the headline numbers into cash flows, one by one, and see how much really remains.

24 Example: the cash that is left

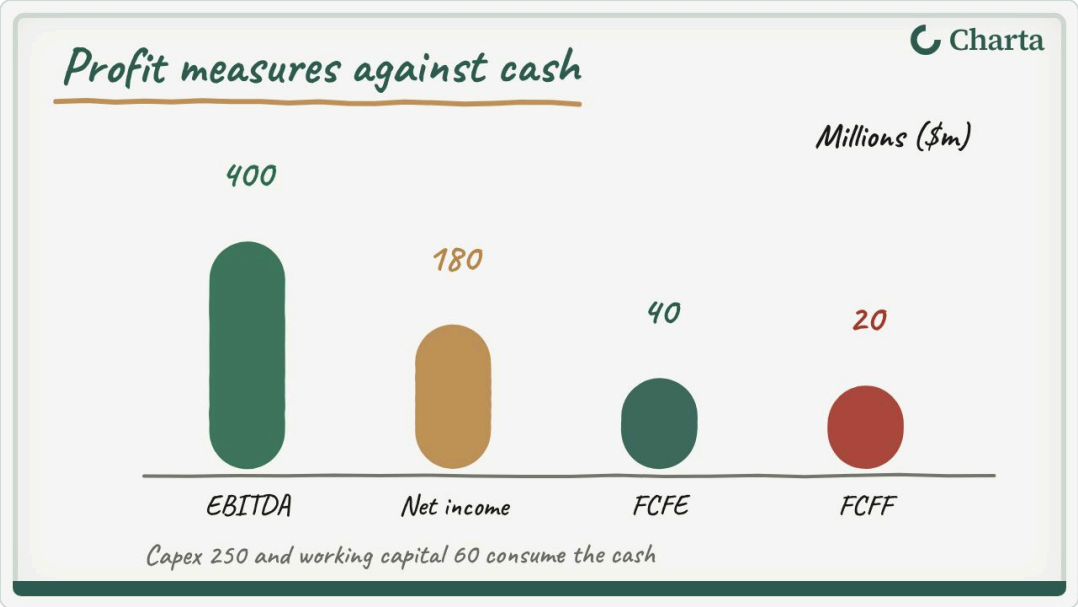
Four measures of the same year

Net income	(400 − 120 − 40) × 0.75	**180**
FCFF	300 + 30 − 250 − 60	**20**
FCFE	180 + 120 − 250 − 60 + 50	**40**
FCFF as share of EBITDA	20 ÷ 400	**5%**

IN THE LESSON

- Net income first.
- Four hundred, minus depreciation one hundred and twenty, minus interest forty, is two hundred and forty before tax.
- Tax takes a quarter, leaving net income of one hundred and eighty.
- Now free cash flow to the firm.
- E B I T D A after tax is four hundred times zero point seven five, which is three hundred.
- Add the depreciation tax shield, one hundred and twenty times zero point two five, which is thirty.
- Subtract two hundred and fifty and sixty.
- The answer is twenty, just five per cent of E B I T D A.
- Free cash flow to equity is one hundred and eighty, plus one hundred and twenty, minus two hundred and fifty, minus sixty, plus fifty.
- That is forty, propped up by borrowing.

25 Profit measures against cash



IN THE LESSON

- Go from left to right.
- EBITDA, at four hundred, is before tax, before interest and before any allowance for equipment.
- Net income, at one hundred and eighty, charges those costs, but it charges depreciation, not the cash actually spent on new capacity, and nothing for the stock and receivables that growth ties up.
- The last two bars charge the cash.
- Free cash flow to equity is forty, and only that high because the company borrowed fifty.
- Free cash flow to the firm is twenty.
- Put a multiple on this company's E B I T D A and you would be valuing cash that the business is actually spending on growth.
- That is the trap this outcome warns against.

26 When a stand-in works

Net income is close to FCFE only if

Condition	Needs to be
Capex against depreciation	Roughly equal
Working capital, borrowing	Stable, zero
Other non-cash items	None large
EBITDA as FCFF	Never: tax

IN THE LESSON

- Is there ever a time when net income is a fair stand in?
- Yes, in a quiet steady state.
- Net income approximates free cash flow to equity only if capital spending roughly equals depreciation, so the non cash charge is exactly offset.
- Working capital must be stable.
- There must be no net borrowing.
- And there must be no other large non cash items.
- Few growing companies meet all of those.
- E B I T D A is weaker still.
- It overstates free cash flow to the firm even in that steady state, because tax is a cash cost and replacement spending still has to be paid for.
- Capital intensive companies look far healthier on E B I T D A than on free cash flow.

27 Testing the valuation

- Change one input, hold the others at base
- See how far the value moves
- The inputs that move it most get the most research
- Two inputs together make a grid

IN THE LESSON

- Last idea.
- Suppose you finish a model and it says a share is worth eighty dollars.
- How sure are you?
- A cook tasting a soup asks what happens if there is a little more salt, or a little less.
- That is sensitivity analysis.
- A free cash flow valuation rests on many inputs: sales growth, margins, investment rates, the discount rate and the long run growth rate.
- Sensitivity analysis changes one input at a time, holding the others at their base values, and watches how far the estimate moves.
- Inputs that move value most deserve the most research.
- Analysts may also change two inputs together, in a grid, to see combined effects.

28 Example: one input at a time

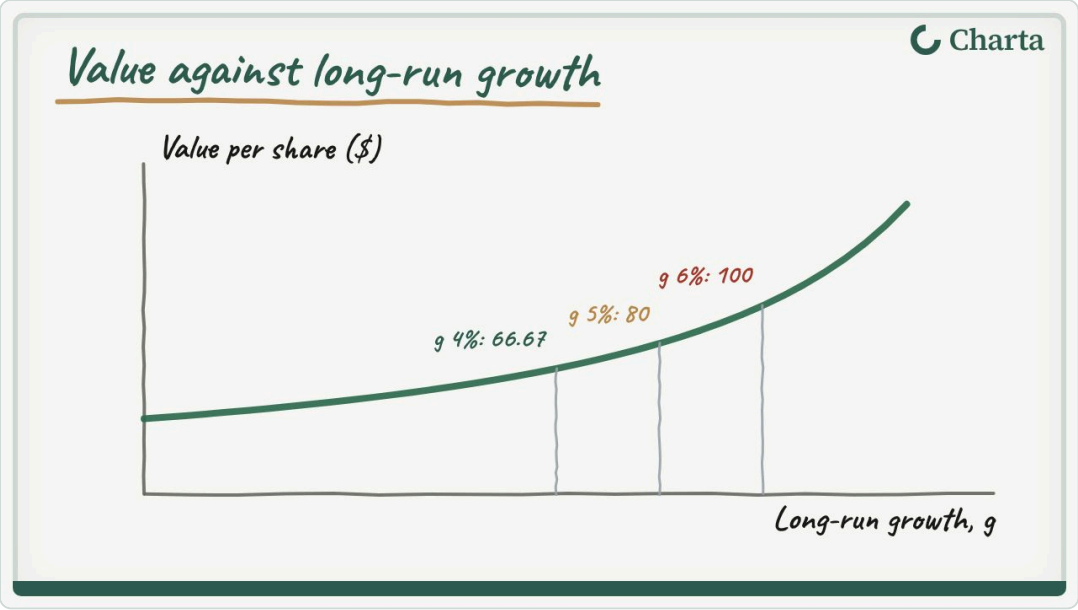
Base: FCFE 4.00, r = 10%, g = 5%, value 80.00

FCFE 10% lower	3.60 ÷ 0.05	**72.00**
Required return 11%	4.00 ÷ 0.06	**66.67**
Growth 6%	4.00 ÷ 0.04	**100.00**
Back to base	4.00 ÷ 0.05	**80.00**

IN THE LESSON

- Our base case values a share at eighty dollars.
- Next year's free cash flow to equity is four dollars, the required return is ten per cent, and growth is five per cent, so four over zero point zero five gives eighty.
- Now change one input.
- Cut the cash flow by ten per cent to three sixty, and the value is three sixty over zero point zero five, seventy two, ten per cent lower.
- Raise the required return to eleven per cent, and the value is four over zero point zero six, sixty six sixty seven, seventeen per cent lower.
- Raise growth to six per cent, and four over zero point zero four is one hundred, twenty five per cent higher.
- A small change in the rate or in growth matters much more.

29 Value against long-run growth



IN THE LESSON

- Here is the same case as a picture.
- Along the bottom is the long run growth rate.
- Up the side is value per share.
- Everything else is held at base: four dollars of cash flow and a ten per cent required return.
- The curve rises slowly at first, then bends upward faster and faster.
- Look at the three marked points, one point of growth apart.
- At four per cent the value is sixty six sixty seven.
- At five per cent it is eighty.
- At six per cent it is one hundred.
- Each step adds more than the one before, because value depends on the gap between the required return and growth, and the gap keeps shrinking.
- On the steep right, a small disagreement about growth is a large disagreement about value.

30 Why the rate and growth dominate

Same base case: five years, then a terminal value

PV of years 1 to 5	FCFE 4.00 growing 5%	**16.60**
Terminal value, year 5	FCFE6 ÷ 0.05	**102.10**
Its present value	102.10 ÷ 1.1^5	**63.40**
Total value	16.60 + 63.40	**80.00**
Terminal share	63.40 ÷ 80.00	**79%**

IN THE LESSON

- Why do those two matter so much?
- Because of the terminal value, the value of all cash flows beyond the explicit forecast.
- Take the same base case, with five forecast years of free cash flow to equity growing at five per cent from four dollars.
- Discounted at ten per cent, those five years are worth only sixteen sixty.
- The terminal value at the end of year five is the year six cash flow, four eighty six times one point zero five, divided by zero point zero five, about one hundred and two ten.
- Discounted back, that is sixty three forty.
- So the terminal value is about seventy nine per cent of the total of eighty.
- It runs entirely through the gap between required return and growth.

31 Two inputs together: a small grid

Value per share, FCFE 4.00 next year

Required return r, growth g	Value
Base: r 10%, g 5%	80.00
Both worse: r 11%, g 4%	57.14
Both better: r 9%, g 6%	133.33
Same gap: r 11%, g 6%	80.00

IN THE LESSON

- Analysts often vary two inputs together.
- Here are four combinations for our share.
- The base case, ten per cent and five per cent, gives eighty.
- Now make both worse, with a required return of eleven and growth of four.
- The value falls to fifty seven fourteen, a drop of twenty nine per cent.
- Make both better, with nine and six, and it jumps to one hundred and thirty three thirty three.
- Notice the last row, eleven and six.
- The value is eighty again, because the gap between the two is still five points.
- It is the gap that counts.
- The trap is quoting one point estimate as precise, when a plausible change in one input shifts value by a large fraction.

32 Recap

- Forecast components; use net capex with DR
- Payouts move cash, only borrowing changes FCFE
- FCFE and DDM: same engine, different flow
- Profit is not cash; test with sensitivity

IN THE LESSON

- Let's recap.
- First, you can project free cash flow with a growth rate or, better for a changing firm, by forecasting sales, margins and investment, and using net capital spending with a target debt ratio.
- Second, dividends, buybacks and share issues do not change those flows, but new borrowing lifts free cash flow to equity now and lowers it later.
- Third, the equity model and dividend models share an engine, and differ in the cash flow; low payout does not mean low worth.
- Fourth, net income and E B I T D A are weak stand ins for cash.
- Fifth, sensitivity analysis shows which inputs move value, and the required return and growth usually dominate.

33 Check yourself

1. NI 120, FCInv 90, Dep 50, WCInv 20, DR 50%. FCFE?
   Answer: 120 − 0.5 × 40 − 0.5 × 20 = 90
2. A buyback paid from cash on hand. Effect on FCFE?
   Answer: None: a use of the flow, not a change in it
3. Next FCFE 2.00, g 4%. r 9% gives 40.00. Value at r 10%?
   Answer: 2.00 ÷ 0.06 = 33.33, 17% lower

IN THE LESSON

- Three questions.
- Question one.
- Net income is one hundred and twenty, fixed capital investment is ninety, depreciation fifty, working capital investment twenty, and the target debt ratio is fifty per cent.
- What is free cash flow to equity?
- Answer: one hundred and twenty, minus half of forty, minus half of twenty, which is ninety.
- Question two.
- A company announces a share buyback paid from cash on hand.
- What happens to free cash flow to equity?
- Answer: nothing, because a buyback is a use of the flow, not a change in it.
- Question three.
- Next year's flow is two dollars, growth four per cent, required return nine per cent, value forty.
- At ten per cent?
- Answer: two over zero point zero six, thirty three thirty three, seventeen per cent lower.

Summary notes for the Charta whiteboard lesson. Figures are from the lesson's made-up examples.