Forecasting and analyst research reports

Equity Investments

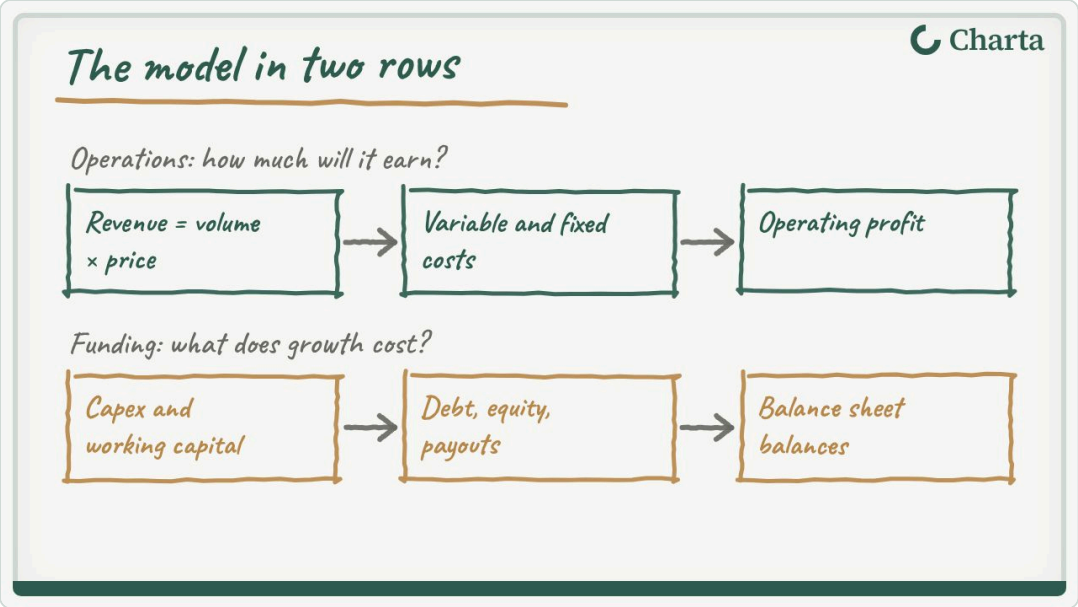
1 A story: the weather forecast

- A weather forecast is built from parts
- Lazy method: grow last year's profit by a percent
- A model builds the statements line by line
- Every number has a reason you can check

IN THE LESSON

- A weather forecaster does not simply say that tomorrow will be like today.
- She looks at the pieces: wind, temperature, moisture.
- She builds a picture from the parts, and she can tell you which piece she is least sure about.
- A company forecast works the same way.
- The lazy method takes last year's profit and grows it by some percentage.
- That leaves nothing to test.
- If the number turns out wrong, you cannot tell why.
- A forecast model builds the company's financial statements forward, line by line.
- Sales first.
- Then the costs that come with sales.
- Then the money the company must spend and raise to deliver that growth.
- Every number then has a reason you can check.

2 The model in two rows



IN THE LESSON

- Here is the model as a picture.
- The top row asks how much the company will earn.
- Revenue comes first, and it is built from its drivers.
- Volume is how many units are sold, and revenue is volume multiplied by price.
- Costs come next, and then profit.
- The bottom row asks what that growth will cost, and who pays.
- Investment means capital spending on equipment, plus the extra working capital, the money tied up in stock and in customers' unpaid bills.
- Financing is how it is paid for: borrowing, new shares, or the cash the firm keeps after dividends and buybacks.
- The last box is the discipline.
- The balance sheet must balance.
- If it does not, cash has been assumed out of thin air.

3 Meet Brightwell Bikes

Brightwell, last year, $m (made up). Working capital 20%, tax 30%

Item	$ millions
Revenue (4m bikes × $50)	200
Variable costs (60%)	120
Fixed costs (incl. 10 depreciation)	50
Operating profit (EBIT)	30

IN THE LESSON

- To make everything concrete we follow one company through the whole lesson, a bicycle maker called Brightwell Bikes.
- All the figures are made up, in millions of dollars.
- Last year it sold four million bikes at fifty dollars each, so revenue was two hundred.
- Variable costs, which rise and fall with the number of bikes, are sixty per cent of revenue, that is one hundred and twenty.
- Fixed costs, which stay the same whatever it sells, are fifty, and they include ten of depreciation.
- So operating profit, called E B I T, earnings before interest and tax, is thirty.
- Working capital runs at twenty per cent of revenue, which is forty.
- The tax rate is thirty per cent.

4 Example 1: revenue, costs and profit

Forecast: volume up 5%, price up 3%, fixed costs unchanged

Revenue	200 × 1.05 × 1.03	**216.30**
Variable costs	60% × 216.30	**129.78**
Fixed costs	unchanged	**50.00**
Operating profit	216.30 − 129.78 − 50	**36.52**
Profit growth	36.52 ÷ 30 − 1	**21.7%**

IN THE LESSON

- Example one.
- Brightwell expects volume up five per cent and price up three per cent.
- Revenue is two hundred, times one point zero five, times one point zero three, which is two hundred and sixteen point three zero.
- We grow volume and price separately, because each is a different assumption we can test.
- Variable costs stay at sixty per cent of revenue, so they are one hundred and twenty-nine point seven eight.
- Fixed costs do not move with sales, so they stay at fifty.
- Operating profit is two hundred and sixteen point three, minus one hundred and twenty-nine point seven eight, minus fifty, which is thirty-six point five two.
- Revenue grew just over eight per cent.
- Profit grew twenty-one point seven per cent.

5 Why fixed costs matter

- Variable costs move with sales; fixed costs do not
- Extra sales on fixed costs: profit grows faster
- Brightwell: profit moves 2.67 times as fast as sales
- In a downturn the same effect cuts profit faster

IN THE LESSON

- Why did profit grow nearly three times as fast as sales?
- Because of fixed costs.
- Think of a bus.
- The driver and the fuel for the route cost the same whether the bus carries ten passengers or forty.
- Once the seats are paid for, each extra passenger adds almost pure profit.
- Analysts call this operating leverage.
- Brightwell keeps forty cents of every sales dollar after variable costs, so last year it kept eighty on two hundred of sales.
- Eighty is two point six seven times the thirty of profit, so profit moves two point six seven times as fast as sales.
- It works in reverse too.
- When sales fall, profit falls faster.
- That is why a model treats fixed and variable costs separately.

6 From profit to free cash flow

FCFF = EBIT × (1 − t) + depreciation − capex − increase in working capital

EBIT after tax	Operating profit after tax
Depreciation	Added back: not cash
Capital spending	New equipment bought
Working capital build	Cash tied up in stock, bills

IN THE LESSON

- Profit is not cash.
- Imagine you earn a good salary, but you also have to buy a new car and keep a stock of groceries.
- What is left to spend freely is smaller than the salary.
- A company is the same.
- Free cash flow to the firm is the cash left for everyone who funds the company, after tax and after paying for growth.
- Start with E B I T and take off tax, which is E B I T times one minus the tax rate.
- Add back depreciation, because it was a cost on paper, not cash going out.
- Subtract capital spending on new equipment.
- Subtract the build in working capital.
- What remains is free cash flow.

7 Example 2: free cash flow

Capital spending 14; working capital stays at 20% of revenue

EBIT after tax	36.52 × (1 − 0.30)	**25.56**
Add depreciation	+ 10	**35.56**
Less capital spending	− 14	**21.56**
Less working capital	20% × (216.30 − 200)	**3.26**
Free cash flow		**18.30**

IN THE LESSON

- Example two.
- Operating profit of thirty-six point five two, after thirty per cent tax, is twenty-five point five six.
- Add back depreciation of ten, and you have thirty-five point five six.
- Brightwell must spend fourteen on new equipment, which leaves twenty-one point five six.
- Now working capital, twenty per cent of revenue.
- Revenue rises by sixteen point three, so working capital rises by three point two six.
- That is cash tied up in extra stock and unpaid customer bills.
- Free cash flow is eighteen point three zero.
- See what happened.
- Profit after tax was twenty-five point five six, but only eighteen point three zero is free to hand to investors.

8 Example 3: who funds it, and does it balance?

Ignore interest. Dividends 8, debt repaid 5

Free cash flow		**18.30**
After dividends of 8	18.30 − 8	**10.30**
After repaying debt of 5	10.30 − 5	**5.30**
Assets rise by	3.26 + 14 − 10 + 5.30	**12.56**
Liabilities + equity rise by	(25.56 − 8) − 5	**12.56**

IN THE LESSON

- Example three.
- To keep things simple we ignore interest.
- Free cash flow is eighteen point three.
- The board pays dividends of eight and repays debt of five.
- That leaves five point three in extra cash.
- Now the balance check.
- Assets rise by working capital of three point two six, plus equipment bought of fourteen, minus depreciation of ten, plus the new cash of five point three.
- That is twelve point five six.
- On the other side, equity rises by profit of twenty-five point five six less dividends of eight, and debt falls by five.
- That is also twelve point five six.
- The statements agree.
- If they had not, we would hunt for the missing cash.

9 A story: the picnic

- One forecast is one guess from many futures
- Bear, base and bull: each case fully consistent
- Value the share in each scenario
- Weight each value by its probability

IN THE LESSON

- You are planning a picnic.
- The forecast says rain is possible.
- Do you plan for sunshine, or for rain?
- A sensible person plans for both, and weights each by how likely it is.
- A single company forecast is one guess drawn from a range of possible futures.
- Printing one number throws the range away.
- Scenario analysis keeps it.
- The analyst builds a few complete, consistent stories.
- Typically there is a bear case, where things go badly, a base case in the middle, and a bull case, where they go well.
- Each has its own sales, margins and investment.
- She values the share under each, then weights the values by her probabilities.

10 Brightwell in three scenarios

Value per share = (10 × profit − net debt 60) ÷ 10m shares

Scenario	Revenue	Profit	Value
Bear: volume −4%, price flat	192.0	26.8	$20.80
Base: volume +5%, price +3%	216.3	36.52	$30.52
Bull: volume +12.5%, price +4%	234.0	43.6	$37.60
Share price today			$27.00

IN THE LESSON

- Now Brightwell's three scenarios, with revenue and operating profit for each.
- In the bear case, volume falls four per cent and price is flat.
- Revenue is one hundred and ninety-two, and operating profit is twenty-six point eight.
- The base case has revenue of two hundred and sixteen point three, and the operating profit of thirty-six point five two we built.
- In the bull case, volume rises twelve and a half per cent and price four per cent.
- Revenue is two hundred and thirty-four, and operating profit forty-three point six.
- To turn profit into a share value we use a simple rule, made up for this lesson.
- The firm is worth ten times operating profit.
- Take off net debt of sixty, and divide by ten million shares.
- That gives twenty point eight, thirty point five two and thirty-seven point six.

11 Weighting by probability

Expected value = p1 × V1 + p2 × V2 + p3 × V3

Probability	Your estimate of its chance
Scenario value	Share value in that case
Total probability	p1 + p2 + p3 must equal 1
Expected value	Probability-weighted average

IN THE LESSON

- Here is the weighting.
- Imagine a game.
- You toss a fair coin.
- Heads, you win ten dollars.
- Tails, you win nothing.
- What is a fair price to play?
- Half of ten plus half of zero is five.
- Yet you never win five.
- The five is an average over the outcomes, weighted by their chances.
- That is the expected value.
- Multiply each scenario's value by its probability, and add them up.
- The probabilities are your honest estimates, and they must add up to one, because one of the scenarios will happen.
- Notice what the expected value is not.
- It is not a forecast of what will happen.
- It may be a number that no scenario ever produces.

12 Example 4: Brightwell's expected value

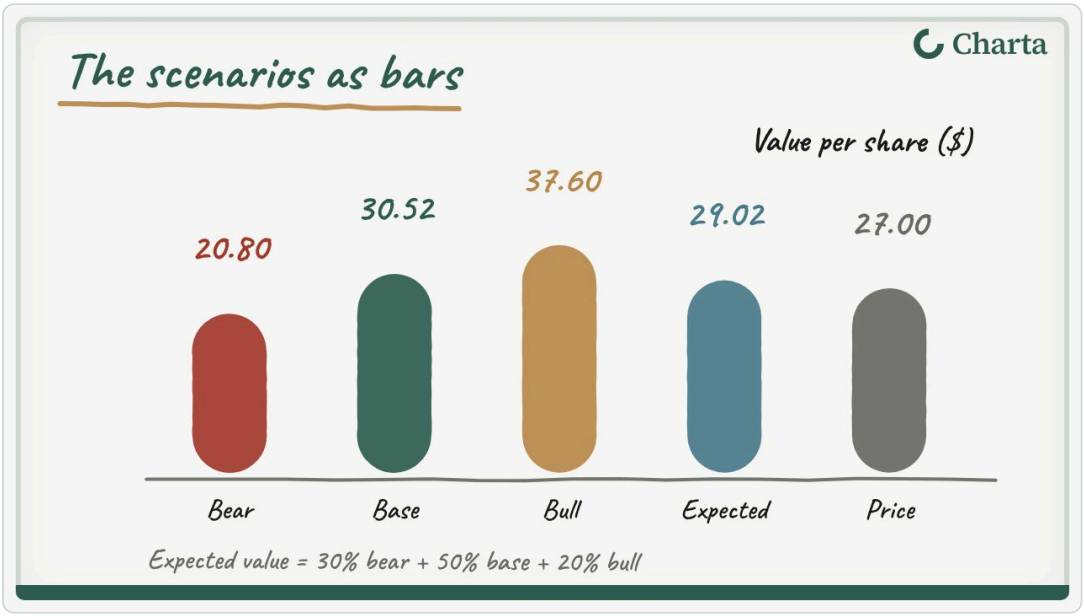
Probabilities: bear 30%, base 50%, bull 20%

Bear	0.30 × 20.80	**6.24**
Base	0.50 × 30.52	**15.26**
Bull	0.20 × 37.60	**7.52**
Expected value	6.24 + 15.26 + 7.52	**29.02**
Upside to price	29.02 ÷ 27 − 1	**7.5%**

IN THE LESSON

- Example four.
- Brightwell's analyst gives the bear case thirty per cent, the base case fifty per cent and the bull case twenty per cent.
- Thirty per cent of twenty point eight is six point two four.
- Fifty per cent of thirty point five two is fifteen point two six.
- Twenty per cent of thirty-seven point six is seven point five two.
- Add them, and the expected value is twenty-nine point zero two.
- The share trades at twenty-seven, so the expected upside is seven and a half per cent.
- But look at the bear case.
- If it arrives, the share is worth twenty point eight, which is twenty-three per cent below the price.
- The expected value is the central estimate, but the spread matters too.

13 The scenarios as bars



IN THE LESSON

- Here are the values as bars.
- Along the bottom are the three scenarios, then the weighted average, then today's price, and the height is value per share in dollars.
- The bear bar is the shortest, at twenty dollars and eighty cents.
- The base bar is thirty dollars fifty-two.
- The bull bar is the tallest, thirty-seven dollars sixty.
- The expected value, twenty-nine dollars and two cents, sits between bear and base, because the bear case was judged more likely than the bull.
- The share price is twenty-seven.
- Compare it with the bear bar, and a buyer loses twenty-three per cent.
- Compare it with the expected bar, and the gain is seven and a half per cent.
- Two numbers, upside and downside, tell what one number cannot.

14 Example 5: test the probabilities

Gloomier weights: bear 40%, base 50%, bull 10%

Bear	0.40 × 20.80	**8.32**
Base	0.50 × 30.52	**15.26**
Bull	0.10 × 37.60	**3.76**
Expected value	8.32 + 15.26 + 3.76	**27.34**
Upside to price	27.34 ÷ 27 − 1	**1.3%**

IN THE LESSON

- Probabilities are judgements, not facts, so test them.
- Suppose a colleague is gloomier.
- She puts the bear case at forty per cent, keeps the base at fifty, and gives the bull case only ten.
- The values have not changed, only the weights.
- Forty per cent of twenty point eight is eight point three two.
- Fifty per cent of thirty point five two is fifteen point two six.
- Ten per cent of thirty-seven point six is three point seven six.
- The total is twenty-seven point three four.
- The apparent upside shrinks from seven and a half per cent to about one point three per cent, barely above the price.
- A good analyst explains how she set the probabilities and shows this test.

15 Common mistakes so far

- Growth with no capex or working capital behind it
- Every cost as a percent of revenue: no leverage
- Probabilities that do not add to one
- Treating the weighted value as the outcome

IN THE LESSON

- Four traps to avoid.
- First, growing profit without paying for the growth.
- A forecast that raises sales but leaves out new equipment and working capital overstates free cash flow, and the balance sheet will not balance.
- Second, treating every cost as a percentage of revenue.
- That hides operating leverage, so profit looks steadier than it is.
- Third, probabilities that do not add up to one.
- If the numbers add to ninety per cent, the expected value is too low, and if to a hundred and ten, too high.
- Fourth, calling the weighted value a prediction.
- It is an average, and the spread around it matters as much as the average itself.

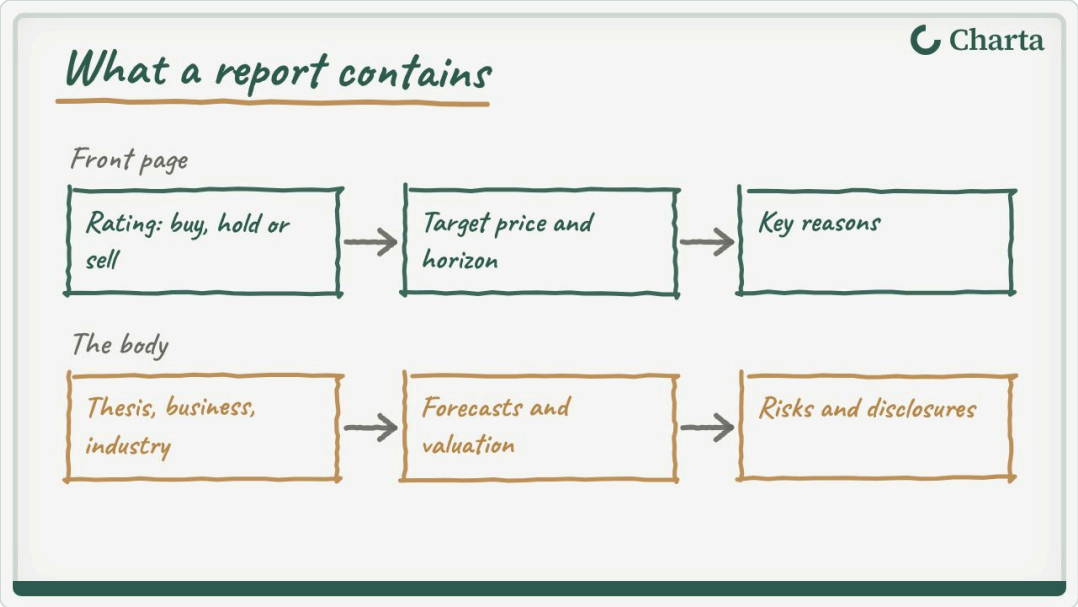
16 A story: the travel guide

- A report is an argument, verdict first
- Front page: rating, target price, key reasons
- Body: thesis, business, forecasts, valuation, risks
- End: disclosures of conflicts of interest

IN THE LESSON

- A good travel guide opens with its verdict: go, or skip.
- Then it gives the reasons, the details, and the warnings.
- You can read the verdict in ten seconds, or read the whole chapter and check the argument.
- An equity research report is built the same way.
- It is a written analysis of a company, and its job is to persuade a busy reader, and to let a careful reader test the argument.
- The first page carries the rating, which is buy, hold or sell, the target price, which is the price the analyst thinks the share will reach, and the key reasons.
- The body then makes the case.
- The end carries the disclosures.

17 What a report contains



IN THE LESSON

- Here is the structure as a picture.
- The top row is the front page, for the reader with thirty seconds.
- The rating, the target price and its time horizon, and the key reasons in brief.
- The bottom row is the body, for the reader with an afternoon.
- It starts with the investment thesis, which is the analyst's central claim about why the market is wrong or right, then describes the business and its industry.
- Next come the financial analysis and forecasts, and the valuation, showing how the target price was reached.
- Then the risks, the specific things that could make the view wrong.
- Last, the disclosures, which tell you whose interests might be pulling on the opinion.

18 Initiation and updates

- Initiation: the first full report on a company
- Longest: business, industry, model, valuation
- Updates: shorter, revise forecasts as news arrives
- Good report: facts apart from forecasts, open assumptions

IN THE LESSON

- When an analyst starts covering a company for the first time, she publishes an initiation of coverage.
- It is the first full report, and usually the longest.
- It lays out the whole model: the business, the industry, the forecasts, the valuation and every assumption.
- Later reports are shorter updates.
- They revise the forecasts as results and news arrive, and they lean on the initiation for the framework.
- A good report keeps facts apart from forecasts, states its assumptions openly, and says what would change the conclusion.
- Think of the initiation as the blueprint of a house, and the updates as the notes on later repairs.

19 From forecast to target price

Target price = EPS × P/E
Expected return = (target − price + dividend) ÷ price

Forecast EPS	Next year's profit per share
Target P/E	Dollars paid per dollar earned
Target price	Where the analyst sees it
Expected return	Gain plus dividend, over price

IN THE LESSON

- The front page gives a target price.
- Where does it come from?
- Often from two numbers multiplied together.
- The analyst forecasts earnings per share, E P S, which is the company's profit for the year divided by the number of shares.
- Then she picks a price to earnings multiple, the P E, which says how many dollars investors pay for one dollar of earnings.
- She takes it from similar companies or from the company's own history.
- Earnings per share times the P E gives the target price.
- To turn the target into a rating, she compares it with today's price and adds the dividend, to get the expected total return.
- If it clears her hurdle, the rating is buy.

20 Example 6: Brightwell's target price

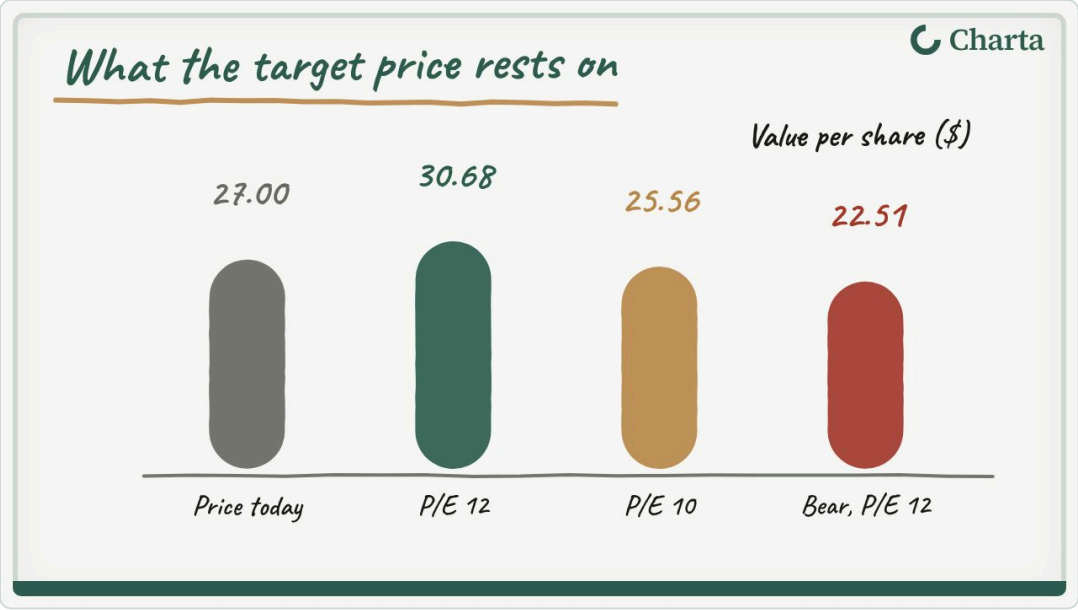
Profit after tax 25.56; 10m shares; price 27; hurdle for a buy 15%

Forecast EPS	25.56 ÷ 10 shares	**$2.56**
Target price	12 × EPS (unrounded)	**$30.68**
Price return	30.68 ÷ 27 − 1	**13.6%**
Expected total return	(30.68 − 27 + 0.80) ÷ 27	**16.6%**
Rating	16.6% is above 15%	**Buy**

IN THE LESSON

- Example six.
- Brightwell's forecast profit after tax is the twenty-five point five six we found, since we ignored interest.
- With ten million shares, earnings per share are about two dollars and fifty-six cents.
- The analyst picks a P E of twelve, the average of similar companies.
- Twelve times that earnings per share, unrounded, gives a target price of thirty dollars and sixty-eight cents.
- Against a price of twenty-seven, that is a price return of thirteen point six per cent.
- Brightwell pays dividends of eight, which is eighty cents a share.
- Add it, and the expected total return is sixteen point six per cent.
- If her hurdle for a buy is fifteen per cent, the rating is buy.

21 What the target price rests on



IN THE LESSON

- Here is why the body matters.
- These bars show the same company on four different assumptions, and the height is dollars per share.
- The first bar is today's price, twenty-seven.
- The second is the target price of thirty dollars sixty-eight, from earnings per share of two fifty-six and a P E of twelve.
- The third uses a P E of ten, and the target drops to twenty-five dollars fifty-six, below the price.
- The fourth keeps the P E of twelve but uses bear case earnings per share of one dollar eighty-eight, and the target is twenty-two dollars fifty-one.
- The buy rating survives only if both numbers are right.
- A sceptical reader asks where each came from, and what would change the conclusion.
- The target price is an output of assumptions, not a fact.

22 A story: three opinions

- Three people praise a restaurant
- Ask: who pays, and who gains if you believe it?
- Sell side, buy side, activist short sellers
- Similar work, different incentives

IN THE LESSON

- Three people tell you a restaurant is excellent.
- A friend, about to eat there with her own money.
- A food critic, whose newspaper is paid by the restaurant's advertisers.
- And a rival, who has just opened across the street.
- All three may be right.
- But you would weigh them differently.
- Who pays for the opinion, and who gains if you believe it?
- That is how to read investment research.
- The same analytical work is done in three commercial settings: on the sell side, on the buy side, and by activist short sellers.
- The work looks alike.
- The incentives do not.

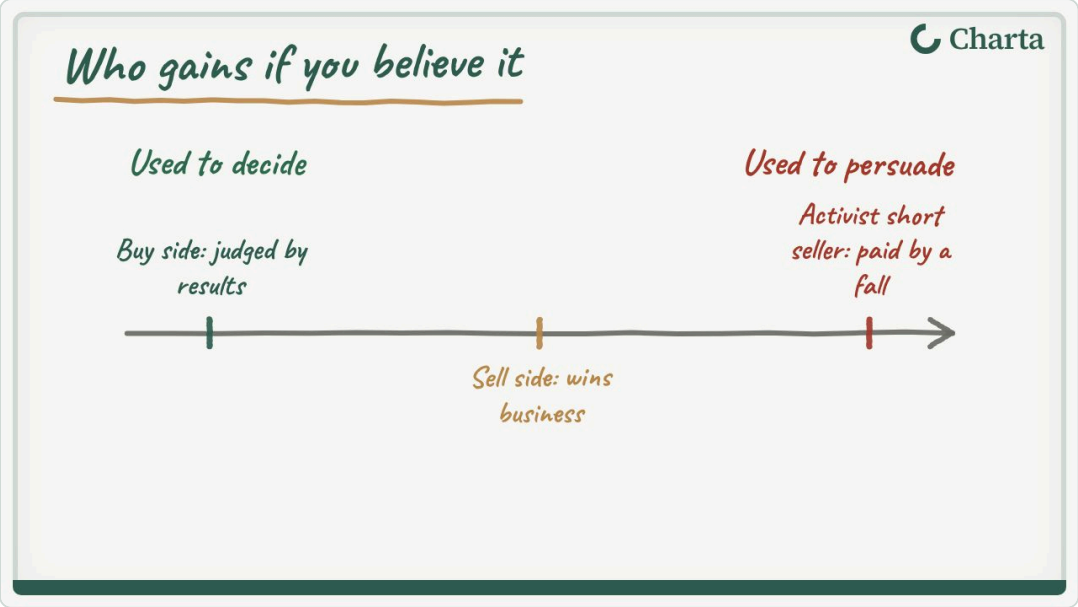
23 Sell side and buy side

- Sell side: brokers and banks, research sent to clients
- It helps win trading and advisory business
- Buy side: asset managers, research kept in house
- Judged by the portfolio's own results

IN THE LESSON

- Sell-side analysts work for brokers and investment banks.
- They publish research to clients, such as fund managers, and the research helps the firm win trading commissions and advisory work.
- That link creates pressure to be positive about companies the bank would like as clients, which is why rules require disclosures and a separation between research and banking.
- Buy-side analysts work for asset managers, pension funds and similar investors.
- Their research is private, written for the portfolio managers in the same firm, and they are judged by whether acting on it made money for the portfolio.
- A flattering view of a poor share simply costs the fund.

24 Who gains if you believe it



IN THE LESSON

- Here is a line from research used to decide, on the left, to research used to persuade, on the right.
- The buy side sits at the left end.
- The reader is the author's own firm, and the only judge is the result.
- The sell side sits in the middle.
- Its research is published to clients, and it supports a business that earns trading and advisory fees.
- Activist short sellers sit at the right end.
- A short seller borrows shares and sells them first, hoping to buy them back cheaper.
- An activist one then publishes research arguing the company is overvalued, sometimes alleging fraud or accounting problems.
- It profits directly when the price falls.

25 Example 7: an activist short seller

Vexler Retail (made up): short 100,000 shares at $40

Sold short at	100,000 shares	**$40**
Price after report	40 × (1 − 0.30)	**$28**
Gain per share	40 − 28	**$12**
Total gain	12 × 100,000	**$1.2m**
If price rose to $52	(40 − 52) × 100,000	**−$1.2m**

IN THE LESSON

- Example seven.
- A fund sells short a hundred thousand shares of a company called Vexler Retail at forty dollars.
- It then publishes a report alleging that Vexler books revenue before earning it.
- The price falls thirty per cent, to twenty-eight.
- The fund buys back at twenty-eight and gains twelve dollars a share.
- On a hundred thousand shares that is one million two hundred thousand dollars.
- Now see the other side.
- If the price had risen to fifty-two, the fund would lose twelve a share, the same amount, and a price can rise without limit.
- The fund is paid by the fall, not by being right, and it is often paid before anyone knows which it was.

26 Reading each kind of research

- Sell side: read the reasoning and the disclosures
- Buy side: private, judged by portfolio results
- Short seller: a claim, not a finding
- Check every allegation against the filings

IN THE LESSON

- Putting it together, three habits.
- For sell-side research, read the reasoning and the disclosures, not just the rating.
- For buy-side research, remember it is private, and judged by results.
- It is not published for clients.
- For an activist short seller, treat the report as a claim, not a finding.
- Some reports have exposed real frauds.
- Others were wrong.
- Because the author profits from a fall, check each allegation against the company's filings before acting.
- The trap is confusing who the reader is.
- The sell side serves clients, the buy side serves its own portfolio, and the short seller serves its own position.

27 A story: two bakers

- Same recipe, different cakes: the inputs differ
- A model is only a framework
- Growth, margins, investment, financing, required return
- Small gaps compound over a long forecast

IN THE LESSON

- Two bakers get the same recipe, the same oven and the same flour.
- Their cakes still differ.
- One adds a pinch more sugar and bakes five minutes longer.
- The recipe is the model.
- The cakes differ because of the inputs and the judgement of the cook.
- Valuation is the same.
- Two analysts can share one model and the same public information, and still land a third apart.
- A model is only a framework.
- The answer comes from the inputs: revenue growth, margins, the investment needed to support growth, financing and the required return.
- Small gaps in each compound over a long forecast.

28 The simplest cash flow model

Value today = next year's free cash flow ÷ (r − g)

Next year's cash flow	Cash expected next year
Required return	Return investors demand
Growth rate	Steady growth for ever
Value today	What the share is worth

IN THE LESSON

- To see this, take the simplest model.
- A share whose cash flow grows at a steady rate for ever.
- Its value today is next year's free cash flow, divided by the required return minus the growth rate.
- The required return is the return investors demand for the risk.
- Look at the bottom of the fraction: required return minus growth.
- When the two are close, the gap is small and the value is large.
- A small change in either one changes the gap by a lot in proportion.
- A half point change on a gap of six points moves the gap by about eight per cent, and the value moves the opposite way.
- In a long model, the value after the last forecast year, the terminal value, works like this.

29 Example 8: two analysts, one model

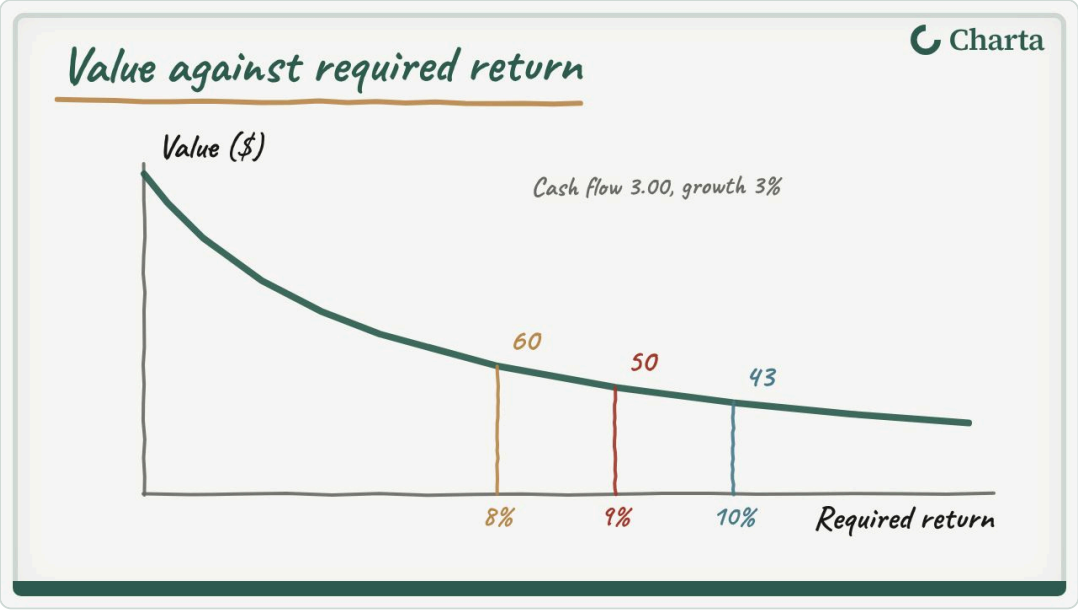
A: cash flow 3.00, r 9%, g 3%. B: 3.30, r 8.5%, g 3.5%

Analyst A	3.00 ÷ (0.09 − 0.03)	**50.00**
B's margins	3.30 ÷ (0.09 − 0.03)	**55.00**
Add B's growth	3.30 ÷ (0.09 − 0.035)	**60.00**
Add B's required return	3.30 ÷ (0.085 − 0.035)	**66.00**
B above A	66 ÷ 50 − 1	**32%**

IN THE LESSON

- Example eight.
- Both analysts use the formula we just saw.
- Analyst A expects cash flow of three dollars, a required return of nine per cent and growth of three per cent.
- Three over zero point zero six is fifty.
- Analyst B expects better margins, so cash flow of three dollars thirty, a growth rate of three and a half per cent, and a required return of eight and a half.
- Change one input at a time.
- Better margins alone lift the value to fifty-five.
- Add B's growth and it reaches sixty.
- Add B's lower required return and it reaches sixty-six.
- B's value is thirty-two per cent above A's.
- Neither made an arithmetic mistake.

30 Value against required return



IN THE LESSON

- Here is why the required return is so powerful.
- Required return runs along the bottom, and value up the side.
- We use analyst A's cash flow of three dollars and growth of three per cent.
- The curve falls steeply on the left and flattens on the right.
- At nine per cent the value is fifty.
- Move left to eight per cent, one point lower, and the value jumps to sixty.
- Move right to ten per cent and the value falls only to about forty-three.
- So a one point cut adds ten dollars, a fifth, while a one point rise takes off about seven.
- The curve bends because the required return sits in the denominator, next to growth.

31 Why views differ, and what to ask

- Which scenario is most likely: bull, base or bear?
- What counts as a one-off item in past profit?
- How long will the competitive advantage last?
- Credible report: key assumptions, sensitivity, why it differs

IN THE LESSON

- Inputs are not the only difference.
- Analysts also differ in judgement.
- Which scenario is most likely, the bull, the base or the bear?
- What counts as a one-off item in past profit, and so should be left out of the forecast?
- How long will the competitive advantage last?
- In our example the market price is fifty-eight dollars.
- Analyst A, at fifty, is thirteen point eight per cent below it and says sell.
- Analyst B, at sixty-six, is thirteen point eight per cent above it and says buy.
- Both are consistent.
- That is why a credible report states its key assumptions, shows how sensitive the value is to them, and explains why its view differs from the market price.

32 Recap: the four formulas

FCFF = EBIT(1 − t) + depreciation − capex − ΔWC
Expected value = Σ p × V
Target = EPS × P/E and Value = FCF ÷ (r − g)

Free cash flow	Forecast model output
Expected value	Scenario weighting
Target price	Report's front page
Value today	Why analysts differ

IN THE LESSON

- Let us pull it together.
- A forecast model builds sales, costs, investment and funding line by line, and ends in free cash flow, which is E B I T after tax, plus depreciation, minus capital spending and the increase in working capital.
- Scenario analysis values the share in several cases and weights them by probability.
- The report packages the result: forecast earnings per share times a P E gives the target price, and the front page turns that into a rating.
- And two analysts with one model can still differ, because value is next year's cash flow over required return minus growth, and every input is a judgement.

33 Try three quick questions

1. Revenue 100, variable costs 60%, fixed 25. Revenue up 10%: operating profit?
   Answer: 110 − 66 − 25 = 19, up from 15.
2. Values 12, 20, 30 with probabilities 0.25, 0.5, 0.25. Expected value?
   Answer: 3 + 10 + 7.5 = 20.5.
3. Cash flow 4.00 next year, r = 10%, g = 4%. Value?
   Answer: 4 ÷ 0.06 = 66.67.

IN THE LESSON

- Now try three quick questions yourself.
- Pause after each one.
- Question one.
- Revenue is one hundred, variable costs are sixty per cent of revenue, and fixed costs are twenty-five.
- Revenue grows ten per cent.
- What is the new operating profit?
- Revenue is one hundred and ten, variable costs sixty-six, so profit is one hundred and ten minus sixty-six minus twenty-five, nineteen, up from fifteen.
- Question two.
- A share is worth twelve, twenty and thirty in three scenarios, with probabilities of a quarter, a half and a quarter.
- What is the expected value?
- Three plus ten plus seven and a half is twenty point five.
- Question three.
- Next year's cash flow is four dollars, the required return is ten per cent and growth is four per cent.
- What is the value?
- Four over zero point zero six is sixty-six point six seven.