CHARTA LEARNING · LESSON NOTES

Valuation concepts

Equity Investments

1 A story: the analyst and the gap

- Tamarind Mills shares trade at 40.00
- Priya's model says they are worth 48.00
- Is the market wrong, or is Priya?
- Both are possible: learn to tell which

IN THE LESSON

- Meet Priya, an analyst at a made up firm called Larkspur Research.
- She covers a listed textile maker called Tamarind Mills.
- The shares trade at forty.
- After a week of work her model says each share is worth forty eight.
- A colleague peers over her shoulder and says, free money, buy a large position now.
- Priya hesitates.
- The market price is a fact.
- Her forty eight is an estimate, built from forecasts and a required return, and every one of those could be off.
- So who is wrong, the market or Priya?
- Both answers are possible, and telling them apart is the first skill of this lesson.

2 Valuation and intrinsic value

- Valuation = estimating what an asset is worth
- Intrinsic value = worth to a fully informed investor
- Price is observed; intrinsic value is only estimated
- Two routes: a model of returns, or similar assets

IN THE LESSON

- A quick reminder of the basics, then we go deeper.
- Valuation means estimating what an asset is worth.
- There are two broad ways to do it.
- One is to build a model of the returns the asset is expected to produce, such as discounted dividends or cash flows.
- The other is to compare the asset with similar assets that already have prices.
- The answer you are after is called intrinsic value.
- It is the worth that a fully informed investor would put on the share, knowing its cash flows and its risk.
- Notice the difference.
- The market price is observed.
- Intrinsic value is never observed.
- It can only be estimated, and estimates carry errors.

3 Where does the gap come from?

Estimate − Price = True mispricing + Estimation error

Your estimate of value	What your model says
Market price	What the market says
True mispricing	Only part that earns a return
Estimation error	Your inputs or your model

IN THE LESSON

- Here is the key idea of the outcome, written as a short equation.
- Take your estimate of value and subtract the market price.
- That difference is the apparent gap.
- The equation says the gap has two parts added together.
- One part is true mispricing, which means the market really has the share wrong.
- The other part is estimation error, which means your own number is wrong.
- The trouble is that you only ever see the total.
- Nothing on your screen labels which part is which.
- And only the first part can earn an active manager a return, because the price has no reason to move towards a number that was mistaken.

4 The model behind the estimate

Value = D1 ÷ (r − g)

Value per share	Estimated worth of one share
D1: next year's dividend	Dividend expected next year
r: required return	Return investors need
g: growth, for ever	Must be smaller than r

IN THE LESSON

- To put numbers on this we need a model, so we use the constant growth dividend model we already know.
- Value per share equals next year's dividend, divided by the required return minus the growth rate.
- The required return, r, is what investors need to earn for bearing the share's risk.
- The growth rate, g, is the rate at which dividends are expected to grow for ever.
- The model only works when r is bigger than g.
- Look at the bottom of the fraction.
- The model divides by the gap between r and g, and that gap is often small.
- A small gap on the bottom means a small change in an input can make a big change in value.

5 Example 1: Priya's first estimate

Tamarind Mills trades at 40.00

Next year's dividend, D1		**2.40**
Growth, g	for ever	**6%**
Required return, r	from the beta	**11%**
Value	2.40 ÷ (0.11 − 0.06)	**48.00**

48.00 is 20% above the price of 40.00

IN THE LESSON

- Back to Priya.
- Tamarind Mills is expected to pay a dividend of two point four zero next year.
- She expects dividends to grow at six per cent a year for ever.
- From the share's beta she works out a required return of eleven per cent.
- The bottom of the fraction is eleven per cent minus six per cent, which is five per cent, or zero point zero five.
- Two point four zero divided by zero point zero five is forty eight.
- The market price is forty, so her estimate sits twenty per cent above it.
- That looks like a bargain, and it is exactly where a careless analyst stops and starts trading.

6 Example 1: check the inputs

Corrected required return: 11.5%

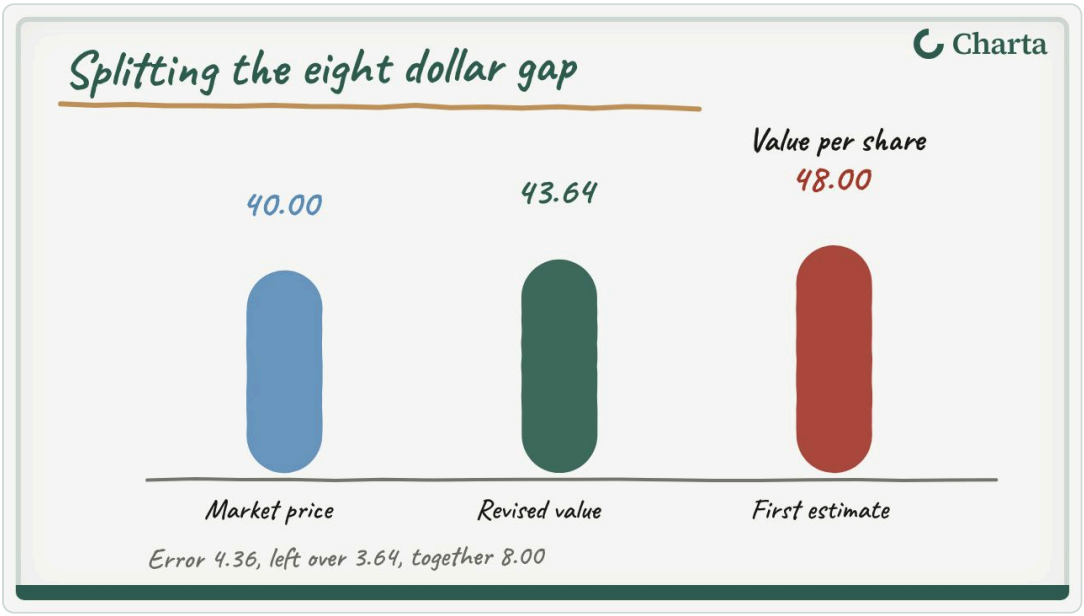
Required return, r	beta corrected	**11.5%**
Revised value	2.40 ÷ 0.055	**43.64**
Estimation error	48.00 − 43.64	**4.36**
Gap that is left	43.64 − 40.00	**3.64**

The left over gap is about 9% of the price

IN THE LESSON

- A careful analyst goes back and checks.
- Priya finds that the beta she used came from old data.
- The up to date beta is higher, and the required return should be eleven and a half per cent, not eleven.
- Nothing about the company has changed.
- Only her input has been corrected.
- Redo the sum.
- Eleven and a half minus six is five and a half per cent, so the bottom is zero point zero five five.
- Two point four zero over that is forty three point six four.
- Her mistake was forty eight minus forty three point six four, which is four point three six.
- What is left over, forty three point six four minus forty, is three point six four.

7 Splitting the eight dollar gap



IN THE LESSON

- Here are the three numbers as bars.
- Along the bottom are the market price, her revised value and her first estimate.
- The height is the value per share.
- The first bar is the market price, forty.
- The second is the revised value, forty three point six four.
- The third, the tallest, is the first estimate, forty eight.
- Now read the steps between them.
- From the price up to the revised value is three point six four, the gap that survived checking.
- It may be true mispricing.
- From the revised value up to the first estimate is four point three six.
- That is Priya's own error, and more than half of the eight point gap was never an opportunity at all.

8 How touchy the estimate is

D1 = 2.40 and g = 6%; only r changes

Required return	Value per share
11.0%	48.00
11.5%	43.64
12.0%	40.00

IN THE LESSON

- This table shows why a big gap should first send you back to your own inputs.
- We keep the dividend at two point four zero and the growth at six per cent, and change only the required return.
- At eleven per cent the value is forty eight.
- At eleven and a half per cent it is forty three point six four.
- And at twelve per cent it is exactly forty, the market price.
- So the whole eight point gap disappears if the required return is one percentage point higher.
- Is eleven right, or twelve?
- Nobody can prove it.
- The market may simply be using a different required return from yours, and then there is no mispricing at all.

9 Why mispricing exists, and why it lingers

- Information and views spread unevenly
- Fear and enthusiasm push prices around
- Prices can take years to move towards value
- Large gap? Check your own inputs before trading

IN THE LESSON

- If markets are good at their job, why would a share ever be mispriced?
- Because information does not reach every investor at the same moment, because investors disagree about the future, and because fear and enthusiasm push prices around.
- So real mispricing does happen.
- But two cautions apply.
- First, spotting it does not pay at once.
- Prices can stay away from intrinsic value for a long time, and may never move the way you expect.
- Second, you only earn from the true mispricing, not from the error.
- So the habit to build is simple: when the gap is large, check the inputs, the model and the required return first, and only then think about a trade.

10 Going concern or liquidation?

- Going concern: the firm keeps operating
- Value comes from cash the assets earn in use
- Liquidation: stop trading, sell, repay creditors
- Most models quietly assume a going concern

IN THE LESSON

- Now the second idea.
- Imagine a baker who owns a shop with ovens, a van and a loyal customer list.
- What is the business worth?
- One answer is the cash it will bring in year after year while it keeps trading.
- The other is what you would get if you shut the doors and sold the ovens, the van and the lease, then paid off what the baker owes.
- The first is called going concern value.
- The company is assumed to keep operating for the foreseeable future, so its value comes from the cash its assets earn while in use.
- The second is liquidation value.
- Almost every model you will use, including the dividend model, quietly assumes the first.

11 Liquidation value, step by step

Liquidation value = Sale proceeds − Selling costs − Liabilities
Healthy firm: going concern value is higher

Sale proceeds	Orderly or forced sale
Selling costs	Fees and legal bills
Liabilities	Creditors are paid first
Going concern value	Cash from using the assets

IN THE LESSON

- Here is how liquidation value of the equity is built.
- Start with the proceeds from selling the assets.
- Take off the costs of selling them, such as agents' fees and legal bills.
- Then take off the liabilities, because creditors are paid before shareholders.
- What is left belongs to the owners.
- How much the assets fetch depends on time.
- An orderly liquidation, with months to find the right buyers, raises more than a forced sale, where assets go at fire sale prices.
- For a healthy firm, going concern value is the larger number, because assets working together are worth more than assets sold one by one.

12 Example 2: a foundry that destroys value

Brindle Foundry, millions; selling costs ignored

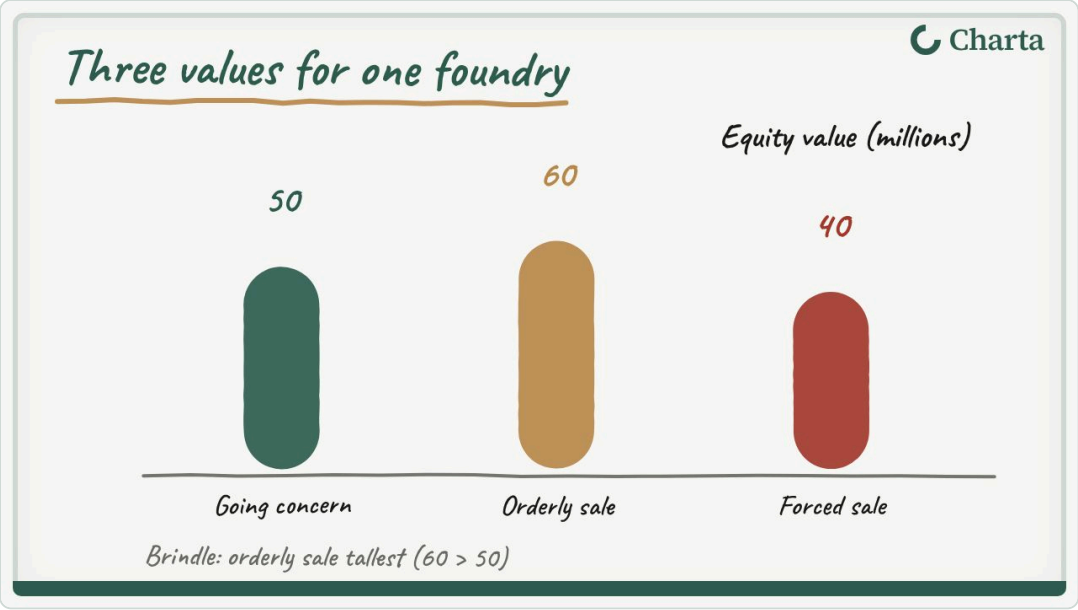
Going concern	6 ÷ 0.12	**50**
Orderly sale	90 − 30	**60**
Forced sale	70 − 30	**40**
Orderly sale beats going concern	60 > 50	**Sell**

The business is worth more sold than used

IN THE LESSON

- Now a case where the order flips.
- Brindle Foundry is a made up struggling company.
- It is expected to produce six million a year for its equity holders for ever, and the required return is twelve per cent.
- Going concern value is six divided by zero point one two, which is fifty million.
- But its assets would raise ninety million in an orderly sale, and only seventy million in a forced sale.
- Liabilities are thirty million.
- Orderly liquidation leaves ninety minus thirty, which is sixty million.
- Forced liquidation leaves seventy minus thirty, which is forty million.
- Sixty is bigger than fifty, so the owners are better off selling than carrying on.

13 Three values for one foundry



IN THE LESSON

- Here are those three values as bars.
- Along the bottom are going concern, orderly sale and forced sale.
- The height is the equity value in millions.
- The going concern bar is fifty.
- The orderly sale bar is taller, sixty.
- The forced sale bar is the shortest, forty.
- Read it from left to right.
- The tallest bar is the best use of the assets, and here it is an orderly sale.
- Notice what time does.
- If the lenders will not wait and the sale is forced, the best choice flips back to carrying on at fifty.
- For a healthy company the picture would look different, with the going concern bar towering over both sale bars.

14 Example 3: liquidation value per share

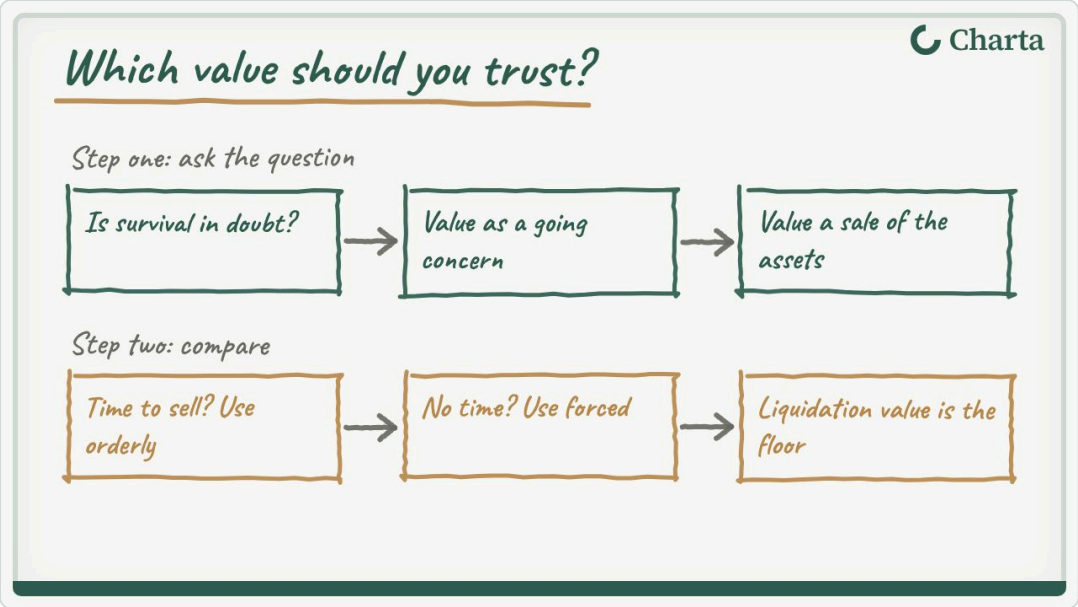
Quillon Cartons: 20 million shares, millions

Proceeds less selling costs	120 − 8	**112**
Less liabilities	112 − 70	**42**
Liquidation value per share	42 ÷ 20	**2.10**
Going concern per share	from the model	**3.00**
If assets fetch only 60	60 − 70 is negative	**0**

IN THE LESSON

- One more example, this time per share.
- Quillon Cartons has twenty million shares.
- An orderly sale would bring in one hundred and twenty million.
- Selling costs are eight million, so net proceeds are one hundred and twelve.
- Liabilities are seventy million, which leaves forty two million for shareholders.
- Divide by twenty million shares and the liquidation value is two point one zero a share.
- The going concern model gives three, so the going concern value is higher, as it should be for a healthy business.
- One last rule.
- Suppose the assets sold for only sixty, less than the seventy owed.
- Shareholders have limited liability, so their equity is worth zero, never below it.

15 Which value should you trust?



IN THE LESSON

- This chart gives the order of thinking.
- On the top row, start by asking whether the survival of the company is in genuine doubt.
- If it is not, value it as a going concern and use your usual model.
- If it is, value the company as a going concern and also by selling the assets, and compare the two.
- On the bottom row, the next question is how much time there is.
- With time, use the orderly figure.
- Without it, use the forced figure.
- In every case the liquidation value acts as a floor.
- If your going concern estimate sits below it, the model is telling you the owners should consider selling.

16 Four mistakes so far

- 1. Calling the whole gap mispricing
- 2. Trading on a big gap before rechecking inputs
- 3. Going concern model on a firm that may fail
- 4. Ignoring orderly versus forced sale

IN THE LESSON

- Before we move on, here are the slips that cost marks.
- One, treating the whole gap between estimate and price as mispricing, when part of it is your own error.
- Two, trusting a big gap without rechecking the required return, the growth rate and the data behind them.
- Three, using a going concern model, such as a dividend discount model, on a distressed company whose survival is truly in doubt.
- A model that assumes dividends for ever is answering the wrong question.
- Four, using one liquidation figure without asking how long the sale takes.
- An orderly sale and a forced sale can differ by many millions, and the lower number may be the realistic one.

17 Worth to whom? Four standards of value

- Fair market value: informed, willing, no pressure
- Fair value (reporting): an exit price
- Investment value: worth to one particular buyer
- Intrinsic value: worth from the fundamentals

IN THE LESSON

- The third idea starts with a question: worth to whom, and for what purpose?
- Picture a house.
- A tax office, an accountant, a neighbour who wants it badly, and a buyer who just wants a good home may each give a different number, and each can be right.
- The same goes for companies.
- Four standards of value matter here.
- Fair market value is the price at which an informed, willing buyer and seller would trade, neither under pressure.
- Fair value, in financial reporting, is an exit price, what you would get for selling in an orderly deal between market participants.
- Investment value is the worth to one particular buyer.
- And intrinsic value is the analyst's estimate of true worth from fundamentals.

18 The four standards side by side

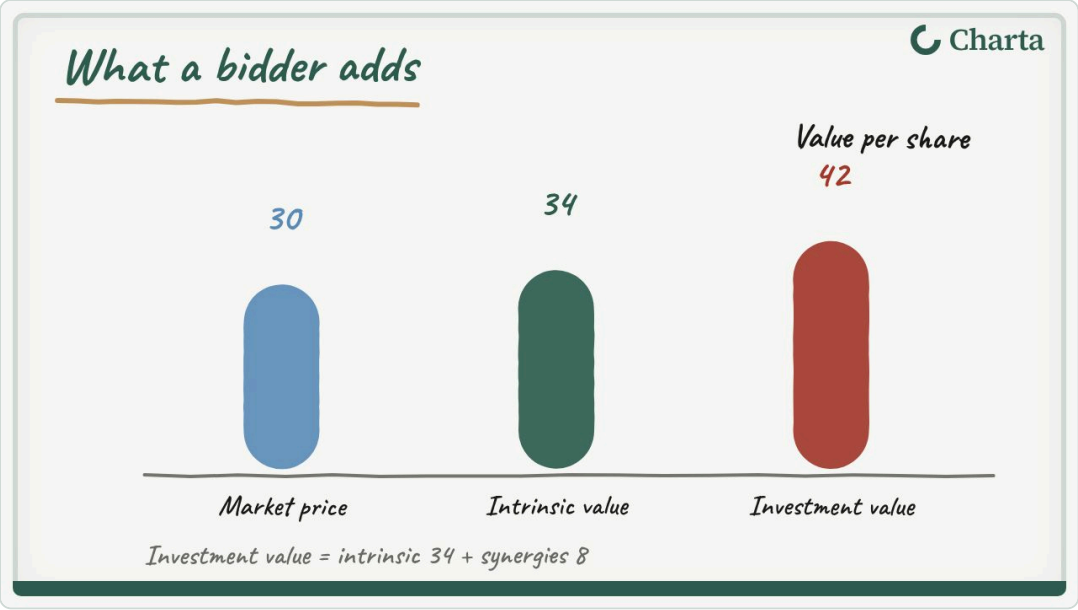
Each standard answers a different question

Standard of value	The question
Fair market value	Fair price
Fair value (reporting)	Exit price
Investment value	To one buyer
Intrinsic value	True worth

IN THE LESSON

- Here are the four standards in a table, with the question each one answers.
- Fair market value asks what an informed, willing buyer and seller would agree, and it is the standard that tax offices and courts often require.
- Fair value asks what a company could get on exit, in an orderly deal, and it is what financial statements report.
- Investment value asks what a business is worth to one named buyer, and it can be higher than market value, because that buyer may count savings and gains that only it can capture.
- Intrinsic value asks what the business is truly worth, given its cash flows and risk, and that is the analyst's own estimate.

19 What a bidder adds



IN THE LESSON

- Now a picture that separates the standards.
- Take a made up listed company called Fernside Foods.
- Along the bottom are the market price, the intrinsic value, and the investment value to one bidder.
- The height is value per share.
- The market price is thirty.
- The analyst's intrinsic value is thirty four.
- The third bar, forty two, is the value to a strategic bidder.
- It is made of the same thirty four plus eight of synergies, meaning the savings and extra sales that this bidder expects by combining Fernside with its own business.
- Those eight come from the bidder's plans, not from Fernside on its own.
- They are real to the bidder, but they are not part of what the shares are worth by themselves.

20 Example 4: use the right yardstick

Fernside Foods trades at 30

Market price		**30**
Intrinsic value	your estimate	**34**
Investment value	34 + 8 synergies	**42**
Upside on intrinsic value	34 ÷ 30 − 1	**13.3%**
Wrong yardstick	42 ÷ 30 − 1	**40.0%**

IN THE LESSON

- Let us see what happens if you pick the wrong standard.
- Fernside trades at thirty.
- Your fundamental estimate, the intrinsic value, is thirty four.
- A strategic buyer counts synergies of eight a share, so its investment value is thirty four plus eight, which is forty two.
- You are advising portfolio investors who are not bidding.
- Measured against intrinsic value, the shares are thirty four divided by thirty, minus one, which is thirteen point three per cent cheap.
- Measured against the bidder's figure, they look forty per cent cheap.
- That second number is a trap.
- It would tell your clients to expect a gain that depends on a takeover that may never come.

21 Which standard fits a listed company?

- Listed shares: use intrinsic value
- The aim is shares priced away from fundamentals
- Other standards answer other questions
- Never call a bidder's synergy value the right price

IN THE LESSON

- So which one should an analyst of listed shares use?
- Intrinsic value.
- The job is to find shares whose prices differ from their fundamentals, so the yardstick must be a view of the fundamentals, not a price paid by one buyer.
- That does not make the other standards useless.
- Fair market value is what tax offices and courts ask for.
- Fair value is what the accounts report.
- And investment value is just what a bidder, or a board judging a bid, needs to know.
- If a takeover is genuinely likely, part of the synergies may be paid to shareholders as a premium, and a careful analyst can weigh that openly.
- What you must not do is call the bidder's number the price at which the shares ought to trade.

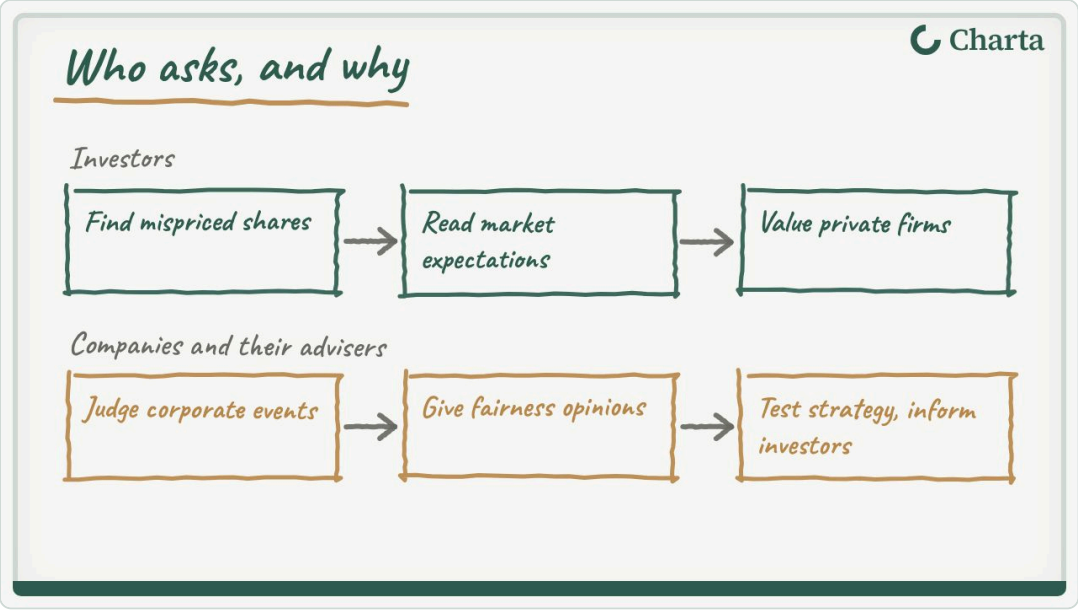
22 Beyond buy and sell

- Analysts turn models into buy and sell calls
- Boards judge offers and deals
- Owners of private firms need a value
- Managers test strategy: same tools, other goals

IN THE LESSON

- The last idea is about how many people use valuation, and for what.
- When you hear equity valuation you may picture an analyst turning a spreadsheet into a buy or sell call.
- That is one use, and an important one.
- But think of a board that has received a takeover offer and must decide whether to accept it.
- Or the owner of a family firm with no market price, who wants to know what it is worth.
- Or a manager who wants to test whether a strategy would create value.
- All of these use the same tools, models and care, even though none of them ends with a buy or sell recommendation.
- Let us group the uses by who is asking.

23 Who asks, and why



IN THE LESSON

- This chart sorts the uses by who is asking.
- The top row is investors.
- First, finding mispriced shares, comparing value with price, which leads most directly to a trade.
- Second, reading expectations, which means working out what the market price already assumes.
- Third, valuing private firms, which have no market price at all, so the valuation must stand in for one.
- The bottom row is companies and their advisers.
- First, corporate events such as mergers, spin offs and changes to the capital structure.
- Second, fairness opinions, in which an adviser tells a board whether a deal price is reasonable.
- Third, strategy and communication: testing management's plans and explaining them to investors.

24 Running the model backwards

g = r − D1 ÷ P

g: growth, for ever	Growth the price demands
r: required return	Return investors need
D1: next year's dividend	Dividend expected next year
P: market price	What the share costs now

IN THE LESSON

- Here is the most useful twist.
- Normally you feed in a growth rate and ask what the share is worth.
- Reverse engineering runs it backwards.
- You take the market price as given and ask what growth it requires.
- Rearrange the dividend model.
- The growth rate equals the required return, minus next year's dividend divided by the price.
- Dividend over price is the dividend yield the share pays.
- So the growth the market is demanding is whatever the required return leaves over after the yield.
- Then you ask a better question than what the share is worth.
- You ask whether that growth is believable, and whether the company can really deliver it for ever.

25 Example 5: what does the price assume?

Both shares: required return 9%

Share A: 2.50 on 50	0.09 − 2.50 ÷ 50	**4.0%**
Share B: 1.00 on 100	0.09 − 1.00 ÷ 100	**8.0%**
Economy grows (made-up figure)	round number	**4.0%**

Can Share B grow at 8% for ever?

IN THE LESSON

- Two made up shares, both with a required return of nine per cent.
- Share A costs fifty and will pay two point five zero next year.
- Its dividend yield is two point five divided by fifty, which is five per cent.
- Nine minus five leaves growth of four per cent for ever.
- Share B costs one hundred and will pay one next year.
- Its yield is one per cent.
- Nine minus one leaves eight per cent growth for ever.
- Suppose the whole economy is expected to grow about four per cent, a round number just for this example.
- Share A needs to keep pace with the economy.
- Share B needs to double it, year after year, for ever.
- Nobody can prove the price is wrong, but now there is a sharp question to debate.

26 Example 6: a fairness opinion

Offer for Fernside Foods: 36 a share, market 30

Premium to market	36 ÷ 30 − 1	**20%**
Synergy shared with sellers	(36 − 34) ÷ 8	**25%**
Range, discounted cash flow	33 to 39	**33–39**
Range, peer multiples	32 to 37	**32–37**
Overlap contains the offer?	33 to 37 holds 36	**Yes**

IN THE LESSON

- The next use is the fairness opinion.
- A board has received an offer for Fernside Foods at thirty six a share, against a market price of thirty.
- The shareholders are being asked to accept.
- An adviser values the company in two ways.
- The discounted cash flow method gives a range of thirty three to thirty nine.
- Peer multiples give thirty two to thirty seven.
- The two ranges overlap from thirty three to thirty seven, and thirty six sits inside.
- The premium to market is thirty six over thirty, minus one, twenty per cent.
- Sellers also get two of the buyer's eight of synergies, a quarter.
- The adviser can say the price is reasonable from the point of view of those shareholders.

27 The trap: every valuation ends in a trade

- Not every valuation ends in buy or sell
- A fairness opinion: is the price reasonable?
- Reverse engineering: is the growth plausible?
- Always ask who is asking and why

IN THE LESSON

- Here is the trap for this part.
- It is the belief that every valuation ends in a buy or sell call.
- A fairness opinion answers a narrower question: is the price reasonable for the shareholders being asked to accept it?
- It is not a recommendation to vote yes, and it says nothing about whether a better bid may come.
- Reverse engineering ends with a judgement about plausibility, not a target price.
- A private company valuation may end in a tax return.
- A strategy test may end in a decision to change nothing.
- So read the question first.
- Who is asking, what decision hangs on the answer, and which standard of value does that decision call for?

28 Recap: the lesson in four lines

Estimate − Price = Mispricing + Error Value = D1 ÷ (r − g)
g = r − D1 ÷ P Liquidation = Sale proceeds − Costs − Liabilities

True mispricing	Only part that earns a return
Going concern value	Value from using the assets
Liquidation value	Value from selling them
Intrinsic value	Right standard for listed shares
g: growth, for ever	What the price assumes

IN THE LESSON

- Let us pull it together.
- First, the gap between your estimate and the price is true mispricing plus your own estimation error, and only the first part earns a return, so check your inputs before you trade.
- Second, the dividend model gives value as next year's dividend over the required return minus growth, and a small change in either input moves the answer a lot.
- Third, going concern value is usually higher than liquidation value, but when a firm destroys value the order flips, and liquidation value is the floor.
- Fourth, for listed shares use intrinsic value, not a bidder's investment value.
- And valuation has many uses beyond trading, including reading what a price assumes.

29 Try three quick questions

1. Dividend 1.80, r = 10%, g = 4% gives 30; price 25. Revised value if r = 11%?
   Answer: 1.80 ÷ 0.07 = 25.71: almost all the gap was error.
2. Assets sell for 80m, costs 4m, liabilities 50m, 10m shares. Value per share?
   Answer: (80 − 4 − 50) ÷ 10 = 2.60
3. Price 20, D1 = 1.00, r = 8%. What growth does the price imply?
   Answer: g = 0.08 − 1.00 ÷ 20 = 3%

IN THE LESSON

- Now try three quick questions yourself, and pause after each one.
- Question one.
- A model gives thirty using a dividend of one point eight zero, a required return of ten per cent and growth of four per cent.
- The price is twenty five.
- The required return should be eleven per cent.
- What is the revised value?
- One point eight zero over zero point zero seven is twenty five point seven one, so almost the whole gap was error.
- Question two.
- Assets sell for eighty million, costs are four million, liabilities fifty million, and there are ten million shares.
- What is liquidation value per share?
- Eighty minus four minus fifty is twenty six, so two point six zero.
- Question three.
- A share costs twenty, with a dividend of one and a required return of eight per cent.
- What growth does the price imply?
- One over twenty is five per cent, so eight minus five is three per cent.
- Well done.