CHARTA LEARNING · LESSON NOTES

Fundamentals, multiples and relative value

Equity Investments

1 A story: two lemonade stands

- A multiple = price paid per unit of profit
- Similar firms can deserve different multiples
- Growth, risk and payout explain the gap
- One model links them all: constant growth

IN THE LESSON

- Picture two lemonade stands on the same street.
- Both earn one hundred dollars a year.
- A buyer offers one thousand dollars for the first stand, but only six hundred for the second.
- Why the gap?
- Perhaps the first stand sits next to a new school, so its profit is likely to grow.
- Perhaps the second depends on a lease that ends next year.
- The price paid for each dollar of profit is the multiple, and the buyer's reasons are the fundamentals: growth, risk, and how much profit is paid out rather than ploughed back.
- Every price multiple in this module can be traced to the same short list of fundamentals, and that is what we learn first.

2 The engine: the constant growth model

P0 = D1 ÷ (r − g)
g = b × ROE

Next year's dividend (D1)	Cash paid out next year
Required return (r)	What investors must earn
Growth rate (g)	Steady growth for ever
Retention ratio (b)	Share of earnings kept
Return on equity (ROE)	Earnings ÷ equity

IN THE LESSON

- All the multiples come from one simple model.
- If a company's dividend will grow at the same steady rate for ever, its value today, P zero, equals next year's dividend divided by the required return minus the growth rate.
- The required return, r, is what investors must earn to be willing to hold the share.
- Growth, g, is the steady rate at which dividends grow.
- And where does growth come from?
- From profit that is kept and reinvested.
- The sustainable growth rate equals the retention ratio, b, which is the share of earnings not paid out, times the return on equity.
- Keep a lot, earn a high return on it, and you grow fast.
- Everything on the next slides is this pair of equations, rearranged.

3 Divide by something: each multiple appears

Leading P/E = payout ÷ (r − g) P/B = (ROE − g) ÷ (r − g)
P/S = margin × payout × (1 + g) ÷ (r − g) Yield = r − g

Justified leading P/E	Payout ÷ (r − g)
Justified P/B	Above 1 only if ROE > r
Justified P/S	Margin × payout, grown
Dividend yield	Equals r − g

IN THE LESSON

- Now divide that value by something, and each multiple appears.
- Divide by next year's earnings, and the justified leading P E equals the payout ratio divided by r minus g.
- Divide by book value per share, and the justified P B equals return on equity minus g, over r minus g.
- Divide by sales per share, and the justified P S equals profit margin times payout times one plus g, over r minus g.
- The one plus g is there because that multiple uses this year's sales, while the dividend is next year's.
- Finally, turn the original equation around.
- The dividend yield, which is the dividend over the price, equals r minus g.
- Each multiple has something good on top, and r minus g underneath squeezing it.

4 Cedar Hill Foods: all four from the same inputs

ROE 12%, payout 50%, margin 8%, required return 10%

Growth g	0.50 × 12%	**6%**
Justified leading P/E	0.50 ÷ (0.10 − 0.06)	**12.5**
Justified P/B	(0.12 − 0.06) ÷ 0.04	**1.50**
Justified P/S	0.08 × 0.50 × 1.06 ÷ 0.04	**1.06**
Dividend yield	r − g = 0.10 − 0.06	**4%**

IN THE LESSON

- Cedar Hill Foods, a made-up grocer, earns a twelve per cent return on equity, pays out half its earnings, and has a net profit margin of eight per cent.
- Investors require ten per cent.
- Growth is retention, one half, times twelve per cent, so six per cent.
- The justified leading P E is zero point five divided by ten per cent minus six per cent, which is twelve point five.
- The justified P B is twelve per cent minus six per cent, over four per cent, so one point five.
- The justified P S is zero point oh eight, times zero point five, times one point oh six, over zero point oh four, which is one point oh six.
- And the dividend yield is four per cent, simply r minus g.

5 More payout, lower P/E?

Justified leading P/E

Payout 40%	**14.3**
Payout 60%	**11.5**
Payout 80%	**10.5**

Example: ROE 12% is above the 10% required return

IN THE LESSON

- Here is the payout ratio at work, as bars.
- Same Cedar Hill Foods, still earning twelve per cent on equity, with a ten per cent required return, but now we change how much is paid out.
- Each bar is the justified leading P E.
- At a forty per cent payout the bar is fourteen point three.
- At sixty per cent it falls to eleven point five.
- At eighty per cent it falls again, to ten point five.
- Surprised?
- Paying out more cash feels like it should be worth more.
- But this company earns twelve per cent on money it keeps, which is more than the ten per cent investors need.
- Every dollar paid out is a dollar that would have grown faster inside the firm.
- So the multiple goes down.

6 The payout trap: it depends on ROE against r

Justified leading P/E, required return 10%

Payout ratio	ROE 12% | 8%
40%	14.3 | 7.7
60%	11.5 | 8.8
80%	10.5 | 9.5
100% (no growth)	10.0 | 10.0

IN THE LESSON

- Now the same test on a company that earns less on equity than investors require.
- Read the table, one row per payout ratio, with the twelve per cent earner on the left and an eight per cent earner on the right.
- The twelve per cent column falls, as we saw.
- The eight per cent column rises, from seven point seven, to eight point eight, to nine point five.
- This firm reinvests at eight per cent when investors demand ten, so each dollar it keeps shrinks in value.
- Paying it out helps.
- At full payout there is no growth at all and both land on ten, which is one divided by the required return.
- So here is the exam trap: a higher payout does not always raise the P E.
- It depends on whether return on equity is above or below r.

7 Which way does each driver push?

Raise one driver, hold the rest

Driver goes up	Effect
Required return r	Multiples fall
Growth g	Multiples rise
Return on equity	P/B rises
Payout ratio	Depends on ROE

IN THE LESSON

- Here is the cheat sheet.
- When the required return goes up, every justified multiple falls, and the dividend yield, which is r minus g, goes up.
- When expected growth goes up, the multiples rise and the yield falls.
- A higher return on equity lifts the P B, because the firm earns more on the book value investors supply.
- A fatter profit margin lifts the P S.
- And payout depends on whether return on equity beats the required return.
- The exam often hands you two companies and asks which deserves the higher multiple.
- Ask which has the better fundamentals.

8 A story: let the market set the price list

- List P/E and fundamentals for many shares
- Cross-sectional: a snapshot across firms
- Regress P/E on payout, growth and beta
- The fitted equation is the market's price list

IN THE LESSON

- So far we worked out a multiple from a model.
- Here is a different idea: let the market tell you what it pays for fundamentals.
- Imagine an analyst at a made-up fund who lists one hundred and fifty shares.
- For each she writes down the P E, the payout ratio, the expected growth, and the beta, which measures risk.
- All are taken at the same moment, which is why this is called cross-sectional: a snapshot across companies, not a history of one company.
- She then runs a regression with the P E as the thing to explain and the three fundamentals as the explainers.
- The fitted equation says how much extra P E the market currently pays for a little more of each fundamental.

9 The fitted equation

P/E regressed on fundamentals, 150 shares (illustration)

Term	Coefficient
Intercept	6.0
Payout ratio	8.0
Growth, in points	1.2
Beta	−3.0

IN THE LESSON

- Here is the fitted output.
- The predicted P E equals six, plus eight times the payout ratio, plus one point two times growth, minus three times beta.
- Read each coefficient as a price.
- Each extra unit of payout ratio, meaning a move from zero to one, adds eight to the P E, so zero point one adds eight tenths.
- Each extra percentage point of growth adds one point two.
- Each extra unit of beta takes three off, because riskier shares are priced lower.
- Growth is entered in percentage points, so eight per cent goes in as eight, not zero point oh eight.
- Together the three fundamentals explain a good part of the differences in P E across the sample.

10 Predicting a P/E for one share

Payout 0.40, growth 8 points, beta 1.2, actual P/E 13.0

Payout term	8.0 × 0.40	**3.2**
Growth term	1.2 × 8	**9.6**
Beta term	−3.0 × 1.2	**−3.6**
Predicted P/E	6.0 + 3.2 + 9.6 − 3.6	**15.2**
Actual against predicted	13.0 against 15.2	**2.2 below**

IN THE LESSON

- Now use it.
- The subject is a made-up bakery chain with a payout ratio of zero point four, expected growth of eight per cent, and a beta of one point two.
- It trades on a P E of thirteen.
- The payout term is eight times zero point four, which is three point two.
- The growth term is one point two times eight, nine point six.
- The beta term is minus three times one point two, minus three point six.
- Add the intercept of six and you get a predicted P E of fifteen point two.
- The actual P E of thirteen is two point two below the prediction.
- That is the regression's way of saying the share looks undervalued, if the equation can be trusted.
- Whether it can be trusted is the next question.

11 Predicted against actual

Chart: Actual P/E vs Predicted P/E

- • D
- • B
- • Subject
- • A
- • C
- Actual = predicted

IN THE LESSON

- Here is that comparison as a picture.
- Along the bottom is the predicted P E, and up the side is the actual P E.
- The grey diagonal is the line where actual equals predicted: a share on it trades exactly as its fundamentals say.
- Shares A, B, C and D sit close to the line, which is what a well fitted regression looks like.
- Now find the subject.
- Its predicted P E is fifteen point two, but it sits lower, at thirteen.
- Below the line means the market pays less than the equation predicts, a hint of undervaluation.
- A share above the line would be a hint of overvaluation.
- Notice the word hint.
- The line itself comes from the market, and the market can be wrong.

12 Where the regression falls short

- True only for this sample and period
- Correlated drivers: single coefficients unreliable
- The line copies the market, mispricing too
- Check signs: payout +, growth +, beta −

IN THE LESSON

- The note of caution matters as much as the method.
- First, the equation is only true for the sample and the period it was estimated on.
- Next year investors may pay more for growth, and the coefficients will move.
- So out of sample, the predictions are often weak.
- Second, payout, growth and beta tend to move together across companies, which makes it hard for the regression to separate their effects.
- A single coefficient can come out with an odd size, or even the wrong sign, while the overall fit looks fine.
- Third, the line is fitted to market prices.
- If the whole sample is overpriced, the line carries that mistake, and a share sitting on it is not proven fair.
- Always check that every sign makes economic sense before you trust a prediction.

13 A story: your own price tag

- Work out the multiple the share ought to have
- Set it beside the multiple the market pays
- Trailing: last year's figure; leading: next year's
- Growth must equal retention × ROE

IN THE LESSON

- Now the other route: build a justified multiple from your own forecasts.
- The analyst forecasts the fundamentals, runs them through the constant growth model, and gets the multiple the share ought to have.
- She then sets it beside the multiple the market is actually paying.
- Think of it as a price tag you work out yourself, then compare with the tag in the shop window.
- Two details matter.
- First, trailing and leading.
- A trailing multiple divides the price by last year's figure.
- A leading multiple divides it by next year's forecast.
- They need different formulas.
- Second, the growth rate you use must agree with the return on equity and payout you have assumed.
- Growth is retention times return on equity, and nothing else.

14 Trailing P/E and price to sales

Trailing P/E = payout × (1 + g) ÷ (r − g)
P/S = margin × trailing P/E

Payout ratio	Share of earnings paid out
Growth rate (g)	From retention × ROE
Required return (r)	Required return
Profit margin	Earnings ÷ sales
Justified trailing P/E	Uses this year's EPS

IN THE LESSON

- Here are the two formulas we have not yet put on the board.
- Start with the trailing P E.
- The leading P E divides the price by next year's earnings.
- The trailing one divides by this year's, which are smaller by the growth factor.
- So we multiply the leading formula by one plus g: the trailing P E equals payout times one plus g, over r minus g.
- Leave out the one plus g and you have quietly built a leading multiple.
- The price to sales ratio then falls out.
- Earnings are the profit margin times sales, so the justified P S equals the profit margin times the trailing P E.
- The payout, the growth and the required return are the same ones as before, and they must tell one consistent story.

15 Brightwell Tools: value from the P/E

EPS 3.00, ROE 15%, payout 60%, required return 11%, price 34

Growth g	0.40 × 15%	**6%**
Next year's EPS	3.00 × 1.06	**3.18**
Justified trailing P/E	0.60 × 1.06 ÷ 0.05	**12.72**
Value from the P/E	12.72 × 3.00	**38.16**
Market P/E	34.00 ÷ 3.00	**11.33**

IN THE LESSON

- Meet Brightwell Tools, a made-up maker of hand tools.
- Last year it earned three dollars a share.
- Return on equity is fifteen per cent, payout is sixty per cent, and investors require eleven per cent.
- The share price is thirty four dollars.
- Growth is retention, zero point four, times fifteen per cent, so six per cent.
- Next year's earnings are three times one point oh six, which is three point one eight.
- The justified trailing P E is zero point six times one point oh six, over eleven per cent minus six per cent, so twelve point seven two.
- Times last year's three dollars, that gives a value of thirty eight dollars sixteen cents.
- The market P E is thirty four over three, eleven point three three.
- It is below the justified level, so far the share looks cheap.

16 Brightwell Tools: the other two routes

Book value 21.20 and sales 40.00 a share

Justified P/B	(0.15 − 0.06) ÷ 0.05	**1.80**
Value from the P/B	1.80 × 21.20	**38.16**
Profit margin	3.00 ÷ 40.00	**7.5%**
Justified P/S	0.075 × 12.72	**0.954**
Value from the P/S	0.954 × 40.00	**38.16**

Market: P/B 34 ÷ 21.20 = 1.6; P/S 34 ÷ 40 = 0.85; 34 ÷ 38.16 − 1 = −11%

IN THE LESSON

- Now the other two routes, with book value at the start of the year of twenty one dollars twenty, and sales of forty dollars a share.
- The justified P B is fifteen per cent minus six per cent, over five per cent, which is one point eight.
- Times twenty one twenty gives thirty eight sixteen again.
- For the price to sales, the profit margin is three dollars over forty, seven point five per cent.
- Times the trailing P E of twelve point seven two, the justified P S is zero point nine five four.
- Times forty gives thirty eight sixteen a third time.
- That agreement is your check: consistent inputs give one price.
- The market multiples, P B one point six and P S zero point eight five, are each below justified, so thirty four looks about eleven per cent too low.

17 Mistakes so far

- More payout always means higher P/E: no
- Leading formula with trailing EPS, or reverse
- Dropping 1 + g: 12.0, not 12.72
- Growth that clashes with ROE and payout
- Regression used without a sign check

IN THE LESSON

- Time to pause on the traps.
- One.
- Assuming a higher payout always raises the P E.
- Paying out more leaves less to reinvest and lowers growth, so the answer turns on return on equity against the required return.
- Two.
- Mixing up trailing and leading.
- A leading formula needs next year's earnings.
- A trailing one needs this year's and carries the extra one plus g.
- For Brightwell, leaving it out gives twelve, not twelve point seven two.
- Three.
- Using a growth rate that does not match your return on equity and payout.
- Four.
- Applying a regression equation mechanically, without asking whether the signs make sense, whether growth went in as points, and whether the sample still describes today's market.
- Check these before you check your arithmetic.

18 A story: the bakery bargain

- A low P/E can still be dear if growth is poor
- PEG = P/E ÷ expected growth, in points
- The price paid per point of growth
- Lower PEG = cheaper for the growth

IN THE LESSON

- Suppose you are shopping for a bakery.
- One asks twenty four times its profit, another only fifteen.
- The cheaper one looks like the bargain, until you learn that its profit barely grows, while the pricey one is growing quickly.
- Paying a high multiple for fast growth can be fairer than paying a low multiple for none.
- The P E G ratio puts that idea into one number: the P E divided by the expected growth rate.
- It tells you how many units of P E you are paying for each point of yearly earnings growth.
- Analysts like it because it lets them set companies with different growth side by side, which a plain P E cannot do.

19 The PEG ratio

PEG = P/E ÷ expected EPS growth (in points)

PEG ratio	Price per point of growth
P/E ratio	Price ÷ earnings
Growth, in points	10% growth goes in as 10

IN THE LESSON

- The formula is short.
- The P E G ratio equals the P E divided by the expected earnings growth rate, where the growth rate is written in percentage points.
- A P E of twenty with ten per cent growth gives a P E G of two.
- Notice the units.
- Ten per cent goes in as ten, not zero point one.
- Divide by zero point one by mistake and you get two hundred, which is nonsense.
- How to read it: a lower P E G means you pay less for each point of growth, so the share looks cheaper relative to its growth.
- The ratio assumes P E and growth sit on a straight line, so use it to compare companies, not as a verdict on its own.

20 Three companies, three PEGs

PEG ratio

Company A	**1.5**
Company B	**2.5**
Company C	**1.2**

A: 24 ÷ 16. B: 15 ÷ 6. C: 18 ÷ 15

IN THE LESSON

- Here are three made-up companies as bars.
- The height of each bar is the P E G ratio.
- Company A has a P E of twenty four and expected growth of sixteen per cent, so a P E G of one point five.
- Company B has the lowest P E, fifteen, but growth of only six per cent, so its P E G is two point five, the tallest bar.
- The cheapest looking P E turns out to be the dearest per point of growth.
- Company C has a P E of eighteen and growth of fifteen per cent, a P E G of one point two, the lowest bar.
- On paper, C is the best value.
- But that is not the end of the story, because the P E G ratio has blind spots, and the next slide shows them.

21 The blind spots, in numbers

C: 15% for 2 years then 5%. A: 16% for 5 years

Earnings after 5 years, C	$1.15^2 \times 1.05^3$	**1.53 times**
Earnings after 5 years, A	1.16^5	**2.10 times**
Beta, C against A	1.8 against 1.0	**riskier**
Growth entered as decimal	24 ÷ 0.16	**150: wrong**

IN THE LESSON

- Now the blind spots.
- Suppose C's fast growth lasts only two years, after which it slows to five per cent, while A's sixteen per cent lasts five years.
- Compound it.
- C's earnings after five years are one point one five squared, times one point oh five cubed, which is one point five three times today's.
- A's are one point one six to the fifth power, two point one oh times today's.
- The P E G used one growth number for both and could not see that difference.
- Next, risk.
- C has a beta of one point eight against one for the others, and higher risk justifies a lower P E, so C's lower P E G may just be fair pay for its risk.
- And the slip to avoid: entering growth as a decimal gives a ridiculous one hundred and fifty.

22 A story: where does the forecast stop?

- Forecast a few years in detail
- Then one number: the share's value at the end
- Terminal value = multiple × fundamental
- Discount it back with the dividends

IN THE LESSON

- Imagine you plan to sell a rental flat in four years.
- You can forecast the rent for those four years with care.
- But the biggest part of your answer is the price you will get for the flat at the end.
- Valuing a company over several stages is the same.
- An analyst forecasts dividends for a few years, say four, in detail.
- After that she cannot forecast year by year, so she needs one number for the value of the share at the end of the horizon.
- That number is the terminal value.
- One way to set it is to apply a multiple to a forecast fundamental at the horizon, such as a P E times earnings per share.
- The terminal value is then discounted back, together with the dividends.

23 Terminal value from a multiple

TV = multiple × EPS
Value today = PV of dividends + TV ÷ (1 + r)^n

Terminal value at year n	A value at the end of year n
Chosen P/E multiple	Peer or justified P/E
Forecast EPS	Year n if trailing, else n + 1
PV of dividends, years 1 to n	Discount each at r
Years to horizon (n)	Discount TV for n years

IN THE LESSON

- Here is the recipe.
- The terminal value at the end of year n equals a P E multiple times earnings per share.
- Which earnings?
- Match the multiple to the timing.
- A trailing P E is applied to the earnings of year n itself.
- A leading P E is applied to the earnings of year n plus one.
- Both produce a value at the end of year n.
- Then the value today equals the present value of the dividends for years one to n, plus the terminal value divided by one plus r, raised to the power n.
- Both versions are discounted n years, not n plus one, because both are values at the end of year n.
- The same idea works for firm value, with an E V to E B I T D A multiple times forecast E B I T D A.

24 A four-year forecast, two terminal values

Dividends 1.00, 1.20, 1.40, 1.60; year 4 EPS 4.00; r 10%

PV of four dividends	discounted at 10%	**4.05**
TV, peer trailing P/E 14	14 × 4.00	**56.00**
TV, peer leading P/E 13.3	13.3 × 4.20 (year 5)	**55.86**
Value, peer multiple	4.05 + 56.00 ÷ 1.1^4	**42.29**
Value, justified P/E 12.6	4.05 + 50.40 ÷ 1.1^4	**38.47**

IN THE LESSON

- Dividends of one dollar, one twenty, one forty and one sixty are forecast for years one to four, and year four earnings per share are four dollars.
- The required return is ten per cent.
- Discount the dividends and they are worth four dollars and five cents today.
- Peers trade on fourteen times trailing earnings, so the terminal value is fourteen times four, fifty six dollars.
- A leading multiple of thirteen point three on year five earnings of four twenty gives fifty five eighty six, nearly the same, and still a value at the end of year four.
- Discount fifty six by one point one to the fourth power, add the dividends, and the share is worth forty two twenty nine.
- The analyst's own view is a sixty per cent payout and five per cent growth, so the justified trailing P E is twelve point six, the terminal value is fifty point four oh, and the share is worth thirty eight forty seven.

25 The multiple decides the answer

Value per share

Dividends only	**4.05**
Peer P/E value	**42.29**
Justified P/E value	**38.47**

Terminal value is about 90% of each total

IN THE LESSON

- Here are the answers as bars.
- The first bar is just the present value of the dividends, four dollars and five cents, the same in both methods.
- The second bar is the value using the peer multiple, forty two twenty nine.
- The third uses the justified multiple, thirty eight forty seven.
- Look how small the first bar is.
- About nine tenths of each answer comes from the terminal value, so the single multiple you choose at the horizon matters far more than the four years of careful forecasting before it.
- A peer multiple is grounded in the market, but if the peers are overpriced, that error flows into your valuation.
- A justified multiple is consistent with your discount rate but depends on your growth view.
- A peer trailing P E of fourteen implies stable growth of about five and a half per cent, above the analyst's five.
- That is the three dollars eighty two gap.

26 A story: the low price tag

- Compare with peers, sector or own justified value
- Below benchmark, same fundamentals: cheap?
- Above benchmark, same fundamentals: dear?
- Growth, risk or accounting gaps can explain it

IN THE LESSON

- You see a coat on sale at half the price of the same looking coats next door.
- A bargain?
- Perhaps.
- Or perhaps the seams are weak.
- A low multiple is that low price tag.
- It might mean the market has overlooked the share.
- It might mean the market has seen something you have not.
- To judge, you compare the share's multiple with a benchmark: the peer average or median, the sector, or the share's own justified multiple.
- Below the benchmark, with similar fundamentals, points to undervaluation.
- Above it points to overvaluation.
- The key phrase is with similar fundamentals.
- If growth, risk or accounting differ, the multiple can differ for good reason, and the comparison is only a question, never an answer.

27 A cheap bank? Test it

Bank: P/B 0.9, ROE 8%. Peers: P/B 1.4, ROE 12%. r 10%, g 4%

Discount to peers	0.9 ÷ 1.4 − 1	**−36%**
Justified P/B, bank	(0.08 − 0.04) ÷ 0.06	**0.67**
Justified P/B, peers	(0.12 − 0.04) ÷ 0.06	**1.33**
Bank against its own	0.9 ÷ 0.67	**1.35 times**
Peers against their own	1.4 ÷ 1.33	**1.05 times**

IN THE LESSON

- A made-up bank trades on nine tenths of book value and earns eight per cent on equity.
- Its peers have a median P B of one point four and a median return on equity of twelve per cent.
- The required return is ten per cent for all, and long-run growth is four per cent.
- Against the peers, zero point nine over one point four, minus one, is a discount of thirty six per cent.
- It looks cheap.
- Now justify.
- The bank's own P B is eight minus four, over ten minus four: zero point six seven.
- The peers' is twelve minus four, over six: one point three three.
- The bank trades at zero point nine over zero point six seven, one point three five times its justified level, so thirty five per cent too high.
- The peers are at one point oh five times theirs, close to fair.

28 Low P/B is not the same as cheap

Chart: P/B (times book, up to 3) vs ROE (up to 25%)

- • Bank
- • Peers
- Justified P/B
- P/B = 1

IN THE LESSON

- Here is the same story as a picture.
- Along the bottom is return on equity, and up the side is price to book.
- The grey line is the justified P B at a ten per cent required return and four per cent growth.
- It starts at zero, where return on equity equals growth, and rises as return on equity increases, crossing one when return on equity equals the required return.
- Find the peers: twelve per cent and one point four, sitting just above the line.
- Now the bank, at eight per cent and zero point nine.
- It sits well above the line.
- Its P B is low, but for an eight per cent earner the justified level is lower still.
- Read the picture this way: compare each point with the line beneath it, not with the other points.

29 Reading the verdict

A low or high multiple is a question, not an answer

Situation	Verdict
Low P/E, same growth and risk	Cheap?
Low P/E, weaker growth or risk	May be fair
Cheap against a dear peer group	Not proven
Low P/B, ROE below r	Not cheap

IN THE LESSON

- Here is a guide to reading the verdicts.
- A low P E with the same growth and risk as peers points to undervaluation.
- A low P E with weaker growth or higher risk may simply be fair.
- A high P E backed by stronger growth or lower risk may be fair too.
- A share that looks cheap against a peer group that is itself expensive may still be overvalued, because the verdict is relative, not absolute.
- And a low P B alongside a return on equity below the required return is not a bargain at all, as the bank showed.
- To control for the differences, use tools like the P E G ratio for growth, or read the P B next to return on equity.
- Above all, ask why the multiple is low, and let the answer decide your verdict.

30 Recap: five ideas to keep

- Multiples: set by r, g, payout, ROE, margin
- Regression P/E: one sample, check the signs
- Justified multiples: consistent inputs, 1 + g
- PEG = P/E ÷ growth points; blind to risk, time
- TV = multiple × EPS; ask why a multiple is low

IN THE LESSON

- Let us pull it together.
- One.
- Every justified multiple comes from the constant growth model: it rises with growth, payout where return beats r, return on equity and margin, and falls as the required return rises.
- Two.
- A cross-sectional regression gives a predicted P E, but only for its sample, with correlated drivers and signs to check.
- Three.
- Justified multiples need consistent inputs, with one plus g in the trailing ones.
- Four.
- P E G is P E over growth in points, and it ignores how long growth lasts and risk.
- Five.
- A terminal value is a multiple times the fundamental, discounted n years, and a low multiple is a question to investigate before you call a share cheap.

31 Try three quick questions

1. Payout 60%, ROE 10%, r 12%. Justified leading P/E?
   Answer: g = 4%; 0.60 ÷ (0.12 − 0.04) = 7.5
2. P/E of 30 and expected growth of 20%. PEG?
   Answer: 30 ÷ 20 = 1.5 (growth enters as 20)
3. Year 5 EPS 2.50, trailing P/E 12, r 10%. PV of TV?
   Answer: 12 × 2.50 = 30; 30 ÷ 1.1^5 = 18.63

IN THE LESSON

- Pause after each question.
- Question one.
- A company pays out sixty per cent of earnings, earns ten per cent on equity, and investors require twelve per cent.
- What is the justified leading P E?
- Growth is zero point four times ten per cent, four per cent.
- Then zero point six over twelve minus four per cent, which is seven point five.
- Question two.
- A share has a P E of thirty and expected growth of twenty per cent.
- What is the P E G?
- Thirty divided by twenty is one point five.
- Question three.
- Year five earnings are two dollars fifty, the trailing P E at the horizon is twelve, and r is ten per cent.
- What is the terminal value today?
- Twelve times two fifty is thirty at year five.
- Divide by one point one to the fifth, about eighteen dollars sixty three.