CHARTA LEARNING · LESSON NOTES

The cost of capital: debt, equity and WACC

Corporate Issuers

1 A story: who paid for the bakery?

- Bakery needs $40,000 of funding
- Bank lends some, owners put in the rest
- Each source wants a different return
- The business must beat the average

IN THE LESSON

- Picture a small bakery.
- The owner needs forty thousand dollars for ovens and a shop.
- Part comes from a bank loan.
- Part comes from the owner's own savings and from a friend who becomes a part owner.
- Now ask a simple question.
- What does that forty thousand dollars cost?
- The bank wants its interest.
- The friend wants a share of the profits, and a decent one, because the bakery might fail and the friend could lose everything.
- These two do not ask for the same thing.
- So the bakery does not have one cost of money.
- It has a cost for each source, and an average of them all.
- That average is what the business must beat, or it is destroying value.

2 The plan: three steps to one number

- 1. Price debt, after tax
- 2. Price preferred and common equity
- 3. Weight and add: the WACC
- WACC is built from steps 1 and 2

IN THE LESSON

- Here is the plan.
- Step one, we price debt, the money borrowed.
- We will see that the right price is what borrowing costs today, and that tax makes it cheaper.
- Step two, we price equity, the money owners provide.
- There are two kinds.
- Preferred shares, which promise a fixed dividend, and common shares, which promise nothing at all.
- Step three, we weight these costs by how much of each the company uses, and add them up.
- The result is the weighted average cost of capital, which people shorten to W A C C.
- Debt and equity come first because W A C C is built out of them.
- You cannot average numbers you have not found yet.

3 Debt: what does borrowing cost today?

- Old loan: 3% (agreed five years ago)
- Borrowing today would cost 7%
- Cost of capital = what the NEXT $ costs
- Use today's rate, never the old coupon

IN THE LESSON

- Start with debt.
- Suppose you borrowed money five years ago at three per cent.
- Rates have since risen, and a bank would now lend to you only at seven per cent.
- Which one is your cost of debt?
- The cost of capital is about the next dollar you raise, so the answer is seven per cent, the rate you would pay today.
- The three per cent is history.
- It describes what you agreed to in the past, not what funding costs now.
- This is the most common error, so say it again: use the current market rate, never the old coupon.
- The coupon is the fixed interest rate printed on a bond.
- It was set on the day the bond was issued and never changes.

4 Yield to maturity: the rate the market charges

Bond: $50 coupon, $1,000 face value, 10 years (example)

Price of the bond today	what investors pay	**$926.40**
Coupon each year	5% of $1,000	**$50**
Years until repaid	then $1,000 comes back	**10**
Yield to maturity	found on a calculator	**6.00%**

IN THE LESSON

- So how do we find today's rate?
- If the company has a bond that trades, we use its yield to maturity.
- This is the single yearly return an investor earns if they buy the bond at today's price and hold it until it is repaid.
- Here is an example.
- A bond pays a fifty dollar coupon every year, on a face value of one thousand dollars, and repays that thousand in ten years.
- It trades today at nine hundred and twenty six dollars forty.
- Investors paying that price earn six per cent a year, once the coupons and the repayment are counted.
- You find it with a financial calculator, not by hand.
- Six per cent is the pre-tax cost of debt.

5 No bond? Look at the neighbours

- No traded bond? Use comparable issuers
- Same credit rating, similar maturity
- Weaker rating = higher yield
- This yield is the PRE-tax cost of debt

IN THE LESSON

- What if the company has no bond that trades, perhaps because it borrows only from a bank?
- Then we estimate.
- We look for similar borrowers.
- Comparable companies with the same credit rating, which is a grade of how likely a borrower is to repay, and with a similar time until repayment.
- We use the yield on their bonds.
- Think of pricing a house that has never been sold.
- You look at what similar houses on the same street have fetched.
- The same two ideas matter here.
- A weaker credit rating means a higher yield, because lenders want more for the risk.
- And a longer maturity usually means a higher yield too.
- Match both, and you have a fair estimate.

6 The tax shield: a discount from the government

- Interest is deductible: it cuts taxable profit
- Dividends are NOT deductible
- Tax saved by the interest = the tax shield
- Higher tax rate = cheaper debt

IN THE LESSON

- Now the twist.
- Interest a company pays is usually deductible.
- That means the company subtracts it from its profit before working out the tax.
- Dividends paid to owners are not deductible.
- Think of it like a coupon at the till.
- You pay the full price for the interest, but the tax office hands back part of it, by taxing you on a smaller profit.
- The tax you save is called the tax shield, because the interest shields part of your profit from tax.
- So the true cost of borrowing is lower than the rate on the loan.
- The exact saving depends on the tax rate.
- The higher the rate, the more the deduction is worth, and the cheaper debt becomes.

7 The tax shield, in dollars and cents

Profit before interest and tax $1,000, tax rate 25% (example)

Case	Tax paid
No interest: tax on $1,000	$250
With $60 of interest: tax on $940	$235
Tax saved by the interest	$15
Net cost: $60 less $15	$45

IN THE LESSON

- Let us see it in numbers.
- A company earns one thousand dollars before interest and tax, and the tax rate is twenty five per cent.
- First case, no interest.
- Taxable profit is a thousand, so tax is two hundred and fifty.
- Second case, the company borrowed a thousand dollars at six per cent, so it pays sixty dollars of interest.
- Taxable profit falls to nine hundred and forty, and tax falls to two hundred and thirty five.
- It paid fifteen dollars less tax.
- So of the sixty dollars of interest, fifteen came back as a tax saving.
- The net cost was only forty five dollars.
- On a loan of one thousand dollars, that is four point five per cent, not six.

8 After-tax cost of debt

After-tax cost of debt = rd × (1 − t)

After-tax cost of debt	What the firm really bears
Pre-tax cost of debt, rd	Yield to maturity today
Tax rate, t	Company's tax rate, as a decimal

IN THE LESSON

- Here is the formula, which captures what we just saw.
- The after-tax cost of debt equals the pre-tax cost of debt, times one minus the tax rate.
- Take each piece.
- The pre-tax cost of debt is the yield to maturity we found, the rate before any tax effect.
- The tax rate is the company's rate on its profit, written as a decimal, so twenty five per cent is zero point two five.
- One minus the tax rate is the share of the interest the company really bears.
- With a tax rate of twenty five per cent, it bears seventy five per cent.
- The other twenty five per cent is paid by the tax office.
- It is this after-tax figure that goes into the W A C C.

9 Example 1: the after-tax cost of debt

Yield to maturity 6%, tax rate 25%

Pre-tax cost of debt	yield to maturity	**6.00%**
1 − tax rate	1 − 0.25	**0.75**
Pre-tax cost × (1 − tax rate)	6.00% × 0.75	**4.50%**
After-tax cost of debt	goes into the WACC	**4.50%**
Trap: old 5% coupon × 0.75	wrong: it is history	**3.75%**

IN THE LESSON

- Example one.
- We found a yield to maturity of six per cent, and the tax rate is twenty five per cent.
- Step one, one minus zero point two five is zero point seven five.
- Step two, six per cent times zero point seven five is four point five per cent.
- So debt costs this company four and a half per cent after tax.
- Now the trap.
- Suppose the old bond was issued with a five per cent coupon.
- Many people would use five per cent times zero point seven five, which is three point seven five.
- That is wrong, because the coupon is history.
- The market yield is six, and four and a half is the answer.

10 Equity: owners are promised nothing

- Lenders: promised interest and repayment
- Owners: promised nothing, paid last
- Higher risk = higher required return
- Dividends are not deductible: no tax shield

IN THE LESSON

- Now the owners.
- Equity is the money shareholders provide, and it is different in a key way.
- A lender is promised interest and the money back, in writing.
- A shareholder is promised nothing.
- If the company does well, they gain.
- If it struggles, they are paid last, after the lenders.
- So shareholders take more risk, and they need a higher return to be willing.
- Because there is no contract, we cannot read the cost of equity from a loan agreement.
- We have to estimate what shareholders require.
- Also, dividends are not deductible, so there is no tax shield.
- Together, the higher risk and no shield make equity the more expensive source.
- There are two kinds, preferred and common, so let us take preferred first.

11 Cost of preferred equity

Cost of preferred = Dp ÷ Pp

Cost of preferred, rp	Return at today's price
Preferred dividend, Dp	Fixed yearly dividend in dollars
Preferred price, Pp	What the share trades at now

IN THE LESSON

- Preferred shares are a hybrid.
- They pay a fixed dividend every year, with no end date, and the dividend must be paid before common shareholders get anything.
- Because the payment is fixed and goes on forever, the cost is a simple perpetuity.
- A perpetuity is a payment that continues for ever.
- The cost of preferred equity equals the preferred dividend divided by the current price of the preferred share.
- The dividend is the fixed annual amount in dollars.
- The price is what the share trades at now, not the price it was first sold at.
- This is the return a buyer earns at today's price.
- No tax adjustment is made, because dividends are not deductible.

12 Example 2: the cost of preferred

Preferred shares, fixed dividend (example)

Dividend each year	fixed, no end date	**$4.00**
Price today	not the original price	**$50.00**
Cost of preferred	$4 ÷ $50	**8.00%**

IN THE LESSON

- Example two.
- A company has preferred shares that pay a fixed dividend of four dollars a year.
- They trade today at fifty dollars each.
- The cost of preferred is four divided by fifty, which is zero point zero eight, or eight per cent.
- Notice what happens when the price changes.
- If the price fell to forty dollars, the same four dollar dividend would be a ten per cent return, so the cost rises.
- A lower price means a higher cost.
- Also see that eight per cent is higher than the four and a half per cent we found for debt after tax, which fits the idea that preferred ranks behind lenders and has no tax shield.

13 Cost of common equity: the CAPM

Cost of common equity = rf + β × equity risk premium

Cost of common equity, re	Return owners require
Risk-free rate, rf	Safe government return
Beta	How much it swings with the market
Equity risk premium	Extra return for owning shares

IN THE LESSON

- Common shares are harder, because they promise no dividend at all.
- The first method is the capital asset pricing model, which people call the C A P M.
- It says the required return equals the risk-free rate, plus beta times the equity risk premium.
- The risk-free rate is what a safe government loan pays.
- The equity risk premium is the extra return investors require for holding the market of shares rather than the safe loan.
- Beta measures how strongly this particular share moves with the market.
- A beta of one means it moves with the market.
- A beta above one means it swings more, so it needs a larger premium.
- A beta below one means it swings less.

14 Example 3: the CAPM in numbers

Risk-free 3%, equity risk premium 5%, beta 1.2 (example)

Beta × equity risk premium	1.2 × 5.0%	**6.00%**
+ Risk-free rate		**3.00%**
Cost of common equity	3.0% + 6.0%	**9.00%**

IN THE LESSON

- Example three.
- The risk-free rate is three per cent.
- The equity risk premium is five per cent.
- The company's beta is one point two.
- Step one, multiply beta by the premium.
- One point two times five is six per cent.
- This is the extra return for this share's risk.
- Step two, add the risk-free rate.
- Three plus six is nine per cent.
- So shareholders require nine per cent.
- Compare that with debt at four and a half after tax, and preferred at eight.
- Common equity is the most expensive of the three, as we expected.
- A common mistake is to forget to add the risk-free rate and stop at six.
- Another is to use the market return itself instead of the premium.

15 Another route: dividends and growth

Cost of common equity = D1 ÷ P0 + g

Cost of common equity, re	Return owners require
Next dividend, D1	Dividend expected next year
Share price today, P0	What the share trades at now
Growth rate, g	Steady yearly dividend growth

IN THE LESSON

- The second method starts from the value of a share.
- A share is worth the present value of its future dividends.
- If dividends grow at a steady rate for ever, rearranging that idea gives a neat result.
- The cost of common equity equals next year's dividend divided by today's share price, plus the growth rate.
- The first part is the dividend yield, the cash return each year.
- The second part is the growth, the extra return from the dividend rising.
- Together they are the total return shareholders expect.
- Notice it is next year's dividend, not the one just paid.
- If you are given the dividend just paid, multiply it by one plus the growth rate first.

16 Example 4: the dividend method

Dividend just paid $2.00, growth 4%, price $40 (example)

Next dividend D1	$2.00 × 1.04	**$2.08**
Dividend yield D1 ÷ P0	$2.08 ÷ $40	**5.2%**
+ Growth rate		**4.0%**
Cost of common equity	5.2% + 4.0%	**9.2%**

IN THE LESSON

- Example four.
- A company has just paid a dividend of two dollars a share.
- Dividends are expected to grow at four per cent for ever.
- The share trades at forty dollars.
- Step one, find next year's dividend.
- Two dollars times one point zero four is two dollars and eight cents.
- Step two, divide by the price.
- Two point zero eight divided by forty is zero point zero five two, a dividend yield of five point two per cent.
- Step three, add the growth of four per cent.
- The total is nine point two per cent.
- The trap is using the two dollars just paid, which would give five per cent plus four, nine per cent.
- Close, but the wrong method, and sometimes the options are built to catch it.

17 A third method, and a check on all three

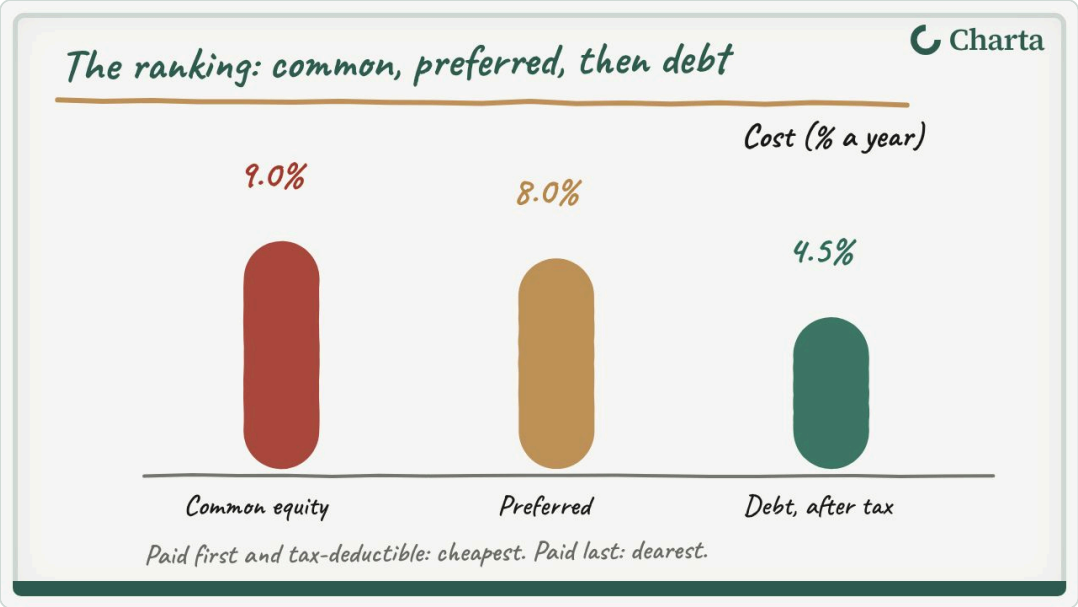
Three estimates of the cost of common equity (examples)

Method	Cost of common equity
CAPM: 3% + 1.2 × 5%	9.0%
Dividends: 5.2% + 4.0%	9.2%
Bond yield + premium: 6% + 3%	9.0%

IN THE LESSON

- There is one more way, used when the other inputs are hard to find.
- It is the bond yield plus risk premium method.
- You start from the company's own bond yield, six per cent in our case, and add a premium for the extra risk of being an owner rather than a lender.
- Analysts often use somewhere between three and five per cent.
- Say three.
- That gives nine per cent.
- Now put our three answers side by side.
- The C A P M gave nine, the dividend method gave nine point two, and this method gave nine.
- They agree closely, which is reassuring.
- In real life the estimates often differ more.
- When they do, do not just pick one.
- Ask which inputs drive the gap, and which you trust most.

18 The ranking: common, preferred, then debt



IN THE LESSON

- Here is the picture that sums up this part.
- Along the bottom are the three sources of money.
- Up the side is what each costs, in per cent a year.
- The tallest bar, on the left, is common equity, at nine per cent.
- It is paid last and is promised nothing.
- The middle bar is preferred equity, at eight per cent.
- It ranks behind lenders and has no tax shield.
- The short bar on the right is debt after tax, at four and a half per cent.
- It is the cheapest, for two reasons.
- Lenders are paid first, so they bear the least risk, and the tax shield trims the cost further.
- The higher the risk, the higher the cost.
- The order always runs common, preferred, debt, from dearest to cheapest.

19 Blending the costs: a weighted average

- Mix of funding: debt, preferred, common
- Weight each cost by its share of the total
- Weights add up to 100%
- WACC = what it costs to keep every funder happy

IN THE LESSON

- Now we can blend.
- A company rarely uses just one source.
- Think of mixing a drink.
- If you pour four parts of a cheap juice and six parts of an expensive one, the taste is closer to the expensive one.
- The cost works the same way.
- You multiply each cost by its share of the total funding, and add the results.
- That is a weighted average.
- The shares are called weights, and they add up to one hundred per cent.
- The answer is the weighted average cost of capital, or W A C C.
- It is the average return the company must earn to satisfy everyone who funded it.
- If the company earns less than that, someone is being short changed, and in the end that is usually the owners.

20 The WACC formula

WACC = wd × rd × (1 − t) + wp × rp + we × re

Debt leg	Debt share × after-tax cost
Preferred leg	Preferred share × its cost
Common equity leg	Common share × its cost
WACC	The blended hurdle rate

IN THE LESSON

- Here is the formula.
- W A C C equals the weight of debt, times the after-tax cost of debt, plus the weight of preferred times its cost, plus the weight of common equity times its cost.
- Three legs added together.
- The weight of debt is the share of funding that is debt.
- Same for preferred and common.
- In the debt leg, the cost is the after-tax cost, which is the yield times one minus the tax rate.
- Preferred and common have no tax adjustment, so they enter as they are.
- A company with no preferred shares just drops the middle leg.
- Check your weights add up to one, and your costs are all annual rates, before you start multiplying.

21 Which weights? Market values and targets

- Book values: old, recorded when raised
- Market values: what each source is worth today
- Use market values, or the target mix
- Book weights understate equity for a strong firm

IN THE LESSON

- Where do the weights come from?
- From the value of each source.
- And there is a choice.
- You can use book values, the amounts recorded in the accounts when the money was raised.
- Or you can use market values, what the debt and shares are worth today.
- Use market values.
- The question is what capital costs now, and the market reflects today's prices.
- Book values are old.
- For a successful company the share price is far above the recorded equity, so book values understate how much of the funding is equity.
- Another route is the target structure, the mix the company aims to hold over time.
- If the question gives a target, use it.
- If not, use current market weights.

22 Example 5: the capital mix (set-up)

Market values of each source of capital (example)

Source of capital	Market value
Debt (weight 40%)	$400m
Preferred (weight 10%)	$100m
Common equity (weight 50%)	$500m
Total capital	$1,000m

IN THE LESSON

- Let us build a full W A C C.
- A company has debt with a market value of four hundred million dollars, preferred shares worth a hundred million, and common shares worth five hundred million.
- The total is one billion dollars, a thousand million.
- The weights are the shares of that total.
- Debt is four hundred out of a thousand, which is forty per cent.
- Preferred is a hundred out of a thousand, ten per cent.
- Common equity is five hundred out of a thousand, fifty per cent.
- They add to a hundred.
- The costs are the ones we found earlier.
- Debt, four and a half per cent after tax.
- Preferred, eight per cent.
- Common equity, nine per cent.

23 Example 5: multiply and add

WACC = weight × cost for each source, then add

Debt: 40% × 4.50%	after tax	**1.80%**
Preferred: 10% × 8.00%		**0.80%**
Common equity: 50% × 9.00%		**4.50%**
WACC	1.80 + 0.80 + 4.50	**7.10%**

IN THE LESSON

- Now multiply and add.
- Debt first.
- Forty per cent times four and a half is one point eight per cent.
- Preferred next.
- Ten per cent times eight is zero point eight per cent.
- Common equity last.
- Fifty per cent times nine is four point five per cent.
- Add them up.
- One point eight plus zero point eight plus four point five gives seven point one per cent.
- So the W A C C is seven point one per cent.
- Look at the stacked bar.
- Common equity is only half the funding, yet it supplies nearly two thirds of the total cost.
- Debt is forty per cent of the funding but only a quarter of the cost.
- Cheap funding is where the bargain lies.

24 Example 6: book weights go wrong

Same costs; book equity $250m instead of market equity $500m

WACC with market weights	40% / 10% / 50%	**7.10%**
WACC with book weights	53% / 13% / 33%	**6.47%**
Understatement	7.10% − 6.47%	**0.63%**

Too little weight on dear equity pulls the average down

IN THE LESSON

- Why do we insist on market values?
- Let us see what happens with book values.
- The same company has the same costs, but in its accounts the common equity is recorded at only two hundred and fifty million, because most of its value has been built up since.
- Debt is four hundred and preferred a hundred, as before.
- Total book capital is seven hundred and fifty.
- Now the weights are fifty three per cent debt, thirteen per cent preferred, and thirty three per cent equity.
- Multiplying out gives a W A C C of six point four seven per cent.
- That is lower than the true seven point one.
- Why?
- Because we gave too little weight to the expensive source, equity, so the average came out too low.

25 WACC as a hurdle rate

- WACC = the hurdle a project must clear
- Return above WACC: creates value
- Return below WACC: destroys value
- It is the discount rate in a project's NPV

IN THE LESSON

- Why do we want this number?
- Because it is the hurdle rate.
- A hurdle is the bar a project must jump.
- When a company invests in a new factory or a new product, the money comes from its funders, and they collectively need the W A C C.
- So a project must earn at least that to be worth doing.
- If a project is expected to return more than the W A C C, it creates value for the owners.
- If it returns less, it destroys value, even if it makes a profit in accounting terms.
- In practice, the W A C C is the discount rate in a project's net present value, which is the sum of its future cash flows brought back to today, less the cost.

26 Example 7: accept or reject?

WACC 7.1%. Each project costs $1,000 and pays back in one year

Project A repays $1,085	return 8.5% > 7.1%	**NPV +$13**
Decision on project A		**Accept**
Project B repays $1,060	return 6.0% < 7.1%	**NPV −$10**
Decision on project B		**Reject**

IN THE LESSON

- Example seven.
- The company, with a W A C C of seven point one per cent, looks at two projects.
- Each costs a thousand dollars today and pays back in a year.
- Project A pays back one thousand and eighty five dollars, a return of eight and a half per cent.
- That beats seven point one, so accept.
- Discounting the payback at seven point one per cent gives a value of about one thousand and thirteen dollars, so the net present value is about thirteen dollars.
- Positive, as expected.
- Project B pays back one thousand and sixty, a return of six per cent.
- That is below the hurdle, so reject.
- Its net present value is about minus ten dollars.

27 A trap: one WACC does not fit every project

- WACC suits projects of AVERAGE risk only
- Riskier project: bar set too low, bad ones accepted
- Safer project: bar too high, good ones rejected
- Fix: adjust the hurdle for the project's risk

IN THE LESSON

- There is a catch.
- The W A C C describes the average risk of the whole company.
- It is the right hurdle only for projects as risky as the company itself.
- Suppose the company, which makes bread, considers a risky venture into a new country.
- If it uses the company W A C C, it sets the bar too low, and risky projects slip through.
- A safe project, like replacing an oven, faces a bar that is too high and may be wrongly rejected.
- The fix is to adjust the hurdle for the project's own risk.
- For example, add two percentage points to the seven point one per cent for a riskier project, giving nine point one.
- Project A at eight and a half would now be rejected.

28 Example 8: shifting the mix

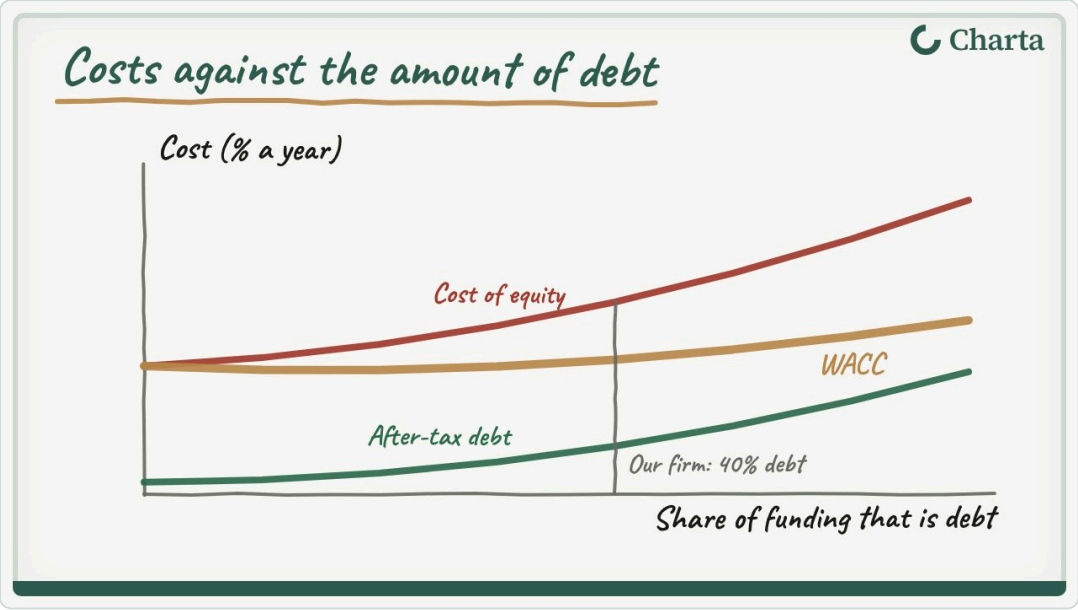
Debt and common equity only (example)

40% debt: 4.50% / 9.00%	starting mix	**7.20%**
50% debt, costs unchanged	naive: too good to be true	**6.75%**
50% debt, costs rise	5.13% / 9.90%	**7.52%**
30% debt, costs lower	4.01% / 8.26%	**6.98%**

IN THE LESSON

- What if the company changes its mix?
- Take a simpler firm with only debt and common equity.
- Forty per cent debt at four and a half after tax, sixty per cent equity at nine.
- The W A C C is seven point two per cent.
- Suppose it swaps ten points of equity for debt, fifty fifty, and the costs stay the same.
- The W A C C falls to six point seven five.
- That looks like a free gift.
- But it is not, because more borrowing makes everyone nervous.
- Lenders raise their rate, and shareholders, bearing more risk, raise theirs.
- With the costs rising, at fifty per cent debt the W A C C is actually seven point five two.
- Move the other way, to thirty per cent debt, and it is six point nine eight.

29 Costs against the amount of debt



IN THE LESSON

- Here is the picture of that story.
- Along the bottom is the share of funding that is debt, from none up to seventy per cent.
- Up the side is the cost, in per cent a year.
- The green line is the after-tax cost of debt.
- It starts low and bends up, because the more a company borrows, the more it must pay to attract lenders.
- The red line is the cost of common equity.
- It climbs too, because heavy debt makes the owners' profits riskier.
- The gold line is the W A C C.
- At first it falls, as cheap debt replaces dear equity.
- Then the rising costs win, and it turns up.
- The marked point, forty per cent debt, is our example, at seven point two.
- The lowest point of the gold line is the best mix.

30 Four mistakes to avoid

- 1. Old coupon instead of today's yield
- 2. No tax adjustment on debt, or tax on equity
- 3. Book weights instead of market weights
- 4. One WACC for projects of every risk

IN THE LESSON

- Before we finish, four mistakes that cost marks.
- One.
- Using the old coupon as the cost of debt.
- The cost of capital is today's market yield, not what was agreed years ago.
- Two.
- Forgetting the tax adjustment on debt, or, worse, applying it to preferred or common equity.
- Only interest is deductible.
- Three.
- Using book values for the weights when market values are available, which understates the expensive equity and pulls the W A C C down.
- Four.
- Using one company W A C C for every project.
- It suits only average risk.
- Riskier projects need a higher hurdle, safer ones a lower one, or the company will quietly back its worst ideas.

31 Recap: from costs to WACC

Debt = rd × (1 − t) Preferred = Dp ÷ Pp
Common = rf + β × ERP
WACC = wd × rd × (1 − t) + wp × rp + we × re

After-tax cost of debt	Debt: yield less the tax saving
Cost of preferred, rp	Preferred: dividend over price
Cost of common equity, re	Common: CAPM or dividends
WACC	Weighted by market values

IN THE LESSON

- Let us pull it together.
- Debt costs its yield to maturity, times one minus the tax rate.
- Preferred costs its dividend divided by its price.
- Common equity costs the risk-free rate plus beta times the equity risk premium, or alternatively next year's dividend over price plus growth, or the bond yield plus a premium.
- Then the W A C C is each weight times its cost, added up, using market values or a target mix.
- The order is always debt, preferred, common, from cheapest to dearest.
- And the W A C C is the hurdle rate for projects of average risk.
- Hold these four lines and the whole topic follows.

32 Try three quick questions

1. A bond yields 8% and the tax rate is 30%. What is the after-tax cost of debt?
   Answer: 8% × (1 − 0.30) = 5.6%. Use the market yield, then the tax adjustment.
2. Preferred pays $2.50 a year and trades at $31.25. What is its cost?
   Answer: $2.50 ÷ $31.25 = 8%. Dividend over today's price.
3. 60% equity at 10% and 40% debt at 5% after tax. What is the WACC?
   Answer: 0.6 × 10% + 0.4 × 5% = 8%.

IN THE LESSON

- Now try three quick questions yourself.
- Pause after each one.
- Question one.
- A company's bond yields eight per cent, and its tax rate is thirty per cent.
- What is its after-tax cost of debt?
- The answer is five point six per cent, eight times zero point seven.
- Question two.
- A preferred share pays two dollars and fifty cents a year and trades at thirty one dollars and twenty five cents.
- What is its cost?
- The answer is eight per cent.
- Question three.
- A company is sixty per cent equity at ten per cent and forty per cent debt at five per cent after tax.
- What is the W A C C?
- The answer is eight per cent, six plus two.
- Well done.