Free cash flow to the firm and to equity

Equity Investments

1 A story: how much could the baker take home?

- Cash you could take out without hurting the business
- Left after costs, tax and keeping the business running
- Free means free to pay to whoever funded it
- Who counts: the owner alone, or the bank too?

IN THE LESSON

- Picture a small bakery.
- At the end of the year the owner asks one simple question.
- How much money could I take home without hurting the bakery?
- Not the profit on paper.
- Real cash.
- She has paid for flour, wages and tax.
- She must also replace the tired old oven and buy ingredients for next season.
- Whatever is left over is cash she could safely hand out.
- Finance people call that free cash flow.
- Free, because it is free to be paid to the people who funded the business.
- The only open question is who those people are.
- Is it the owner alone, or the bank as well?

2 Two groups funded the firm

- FCFF: cash for lenders and shareholders together
- FCFE: cash left for the common shareholders alone
- Both are after tax and after investment
- FCFE is also after the lenders' share

IN THE LESSON

- A company is paid for by two groups.
- Lenders lend money and are promised interest.
- Shareholders put in equity and own whatever is left.
- Free cash flow to the firm, written F C F F, is the cash available to both groups together.
- It comes after operating costs, after tax, and after investment in fixed capital, such as machines and buildings, and in working capital, such as stock and money owed by customers.
- Free cash flow to equity, written F C F E, is what remains for the common shareholders alone, after the lenders have been dealt with: interest paid, debt repaid, and any new borrowing brought in.

3 From the business to the shareholders

Cash the business creates

Sales less costs and tax →
Less fixed and working capital → FCFF

Then the lenders take their share

FCFF →
Less after-tax interest, plus net borrowing →
FCFE

IN THE LESSON

- Here is the chain, drawn left to right.
- The top row starts with sales less operating costs and tax, which is the cash the business throws off.
- Next we take out the money spent on fixed capital and on working capital, because a business that does not reinvest soon stops earning.
- What is left in the third box is free cash flow to the firm.
- The second row carries on from there.
- Take free cash flow to the firm, subtract the interest paid to lenders, after the tax saving that interest brings, and add any new borrowing, since borrowed cash is cash in hand for owners.
- The last box is free cash flow to equity.

4 Match the cash flow to its discount rate

Each cash flow has its own discount rate

Cash flow and rate	Result
FCFF at the WACC	Firm value, less debt
FCFE at cost of equity	Equity value
FCFE at the WACC	Too high
FCFF at cost of equity	Too low

IN THE LESSON

- Each cash flow belongs to a group, and each group wants its own return.
- Free cash flow to the firm belongs to lenders and shareholders, so we discount it at the weighted average cost of capital, the W A C C, which blends the after-tax cost of debt and the cost of equity by their weights.
- That gives the value of the whole firm, and we then subtract the market value of debt to reach equity.
- Free cash flow to equity belongs to shareholders alone, so it is discounted at the cost of equity and gives equity value directly.
- The last two rows are the trap.
- Mixing a cash flow with the wrong rate gives a meaningless answer.

5 Example 1: Kestrel through FCFF

Kestrel Packaging, $m: FCFF 245, growth 4%, WACC 8.9%

Next year's FCFF		**245**
WACC minus growth	8.9% − 4%	**4.9%**
Firm value	245 ÷ 0.049	**5,000**
Less debt	market value	**−1,000**
Equity value	5,000 − 1,000	**4,000**

IN THE LESSON

- Meet Kestrel Packaging, a made-up firm we will use throughout.
- Priya Rao, an analyst, forecasts next year's free cash flow to the firm at two hundred and forty five million dollars, growing at four per cent a year for ever.
- Kestrel's W A C C is eight point nine per cent.
- The gap between the rate and growth is four point nine per cent.
- Two hundred and forty five divided by zero point zero four nine gives a firm value of five thousand million.
- Kestrel has debt of one thousand million at market value.
- Take that away and the equity is worth four thousand million dollars.

6 Example 1: the same firm through FCFE

Debt 1,000 at 6%, tax 25%, cost of equity 10%

After-tax interest	1,000 × 6% × 0.75	**45**
Net borrowing	1,000 × 4%	**40**
FCFE	245 − 45 + 40	**240**
Cost of equity minus growth	10% − 4%	**6%**
Equity value	240 ÷ 0.06	**4,000**

IN THE LESSON

- Now value the same equity directly.
- Kestrel's debt of one thousand million carries six per cent interest and the tax rate is twenty five per cent.
- Interest is sixty million, and after the tax saving it costs forty five million.
- Debt grows with the firm at four per cent, so Kestrel borrows another forty million.
- Start from free cash flow to the firm of two hundred and forty five, take away forty five, add forty, and free cash flow to equity is two hundred and forty.
- The cost of equity is ten per cent, so we divide by six per cent, the gap to growth.
- The answer is four thousand million again.
- Right rate, right flow, same value.

7 What a mismatch does to the answer

Equity value ($m)

Matched	**4,000**
FCFE at WACC	**4,898**
FCFF at Ke	**3,083**

Ke = cost of equity

IN THE LESSON

- Now see what happens if you mix them up.
- The first bar is the correct equity value, four thousand million.
- Next, use free cash flow to equity but discount it at the W A C C.
- The W A C C is pulled down by cheap debt, so the gap to growth is small and the value balloons to about four thousand nine hundred.
- That is more than twenty per cent too high.
- The last bar uses free cash flow to the firm at the cost of equity and then subtracts debt.
- The lenders' cash is discounted at the shareholders' high rate, so the value falls to about three thousand one hundred, more than twenty per cent too low.
- Neither mistake warns you.

8 Which one should you choose?

- FCFF when FCFE is negative
- FCFF when leverage is about to change
- FCFE when leverage is stable: one step to equity
- FCFF always ends with debt taken off

IN THE LESSON

- Both routes give the same equity value when the inputs agree, so the choice is practical.
- Free cash flow to the firm is often preferred when free cash flow to equity is negative.
- A young company that borrows heavily to build factories can have a sensible firm cash flow and a negative equity cash flow, and a negative number is awkward to discount.
- It is also preferred when leverage is about to change, because borrowing and repayments would have to be forecast every year for the equity route, while the firm cash flow is largely untouched by financing.
- Free cash flow to equity is simpler when leverage is steady, because it values equity in one step with no debt to subtract.

9 Whose point of view? The owner who decides

- FCFE: what could be paid out, after all needs
- Dividends: what the board chooses to pay
- A small holder receives only the dividends
- A controlling owner can direct the whole FCFE

IN THE LESSON

- Now to the second question.
- Think of an orchard.
- The owner can leave the apples to rot, buy more trees, pay off the bank, or carry the whole harvest home.
- She decides.
- Free cash flow to equity values the company from that kind of owner's seat.
- It is what the company could pay its shareholders after meeting every obligation and every needed investment, whether or not it actually does so.
- Dividends are different.
- A dividend is just what the board chooses to pay out.
- Someone who owns a handful of shares cannot make the board pay more.
- Someone who controls the company can.
- So F C F E is the owner who can decide where the cash goes.

10 Minority holder versus controlling owner

- Minority view: dividends are all you get
- Control view: the owner can release the whole FCFE
- So FCFE suits takeover analysis
- A minority stake may be worth less than its slice

IN THE LESSON

- This split gives F C F E a control flavour.
- A minority investor sees only dividends, so a dividend model is her honest view.
- A controlling shareholder can order the board to distribute the free cash flow, change the dividend policy, or use it for something else.
- For that reason a free cash flow to equity value is generally taken to reflect a control perspective.
- It is the natural measure for takeover analysis, where a bidder buys the power to decide.
- It also explains why a minority stake can be worth less than its simple share of the F C F E value.
- If dividends sit far below F C F E, the cash that piles up is out of the minority holder's reach.

11 Same company, four numbers

Value per share ($)

Dividend value	**$10**
Market price	**$12**
Bid for control	**$17**
FCFE value	**$20**

IN THE LESSON

- Let us put numbers on it.
- Kestrel has two hundred million shares.
- Free cash flow to equity is two hundred and forty million dollars, so one dollar twenty a share.
- The board pays out half, sixty cents a share.
- Required return is ten per cent and growth is four per cent.
- The first bar is the dividend value, ten dollars.
- That is the minority view.
- The market price is twelve dollars, the second bar.
- A bidder offers seventeen dollars for control, the third bar.
- The tall bar is the F C F E value, twenty dollars, which is what a controlling owner could extract.
- Notice how the offer sits above the price but below the control value.

12 Example 2: minority value against control value

Per share: dividend 0.60, FCFE 1.20, r 10%, g 4%, price 12, bid 17

Dividend value	0.60 ÷ 0.06	**$10.00**
FCFE value	1.20 ÷ 0.06	**$20.00**
Premium of the bid	17 ÷ 12 − 1	**41.7%**
Left for the bidder	20 − 17	**$3.00**

IN THE LESSON

- Here are the calculations.
- The dividend is sixty cents next year, and the gap between the required return and growth is six per cent, so the dividend value is sixty cents over zero point zero six, which is ten dollars.
- The free cash flow to equity per share is one dollar twenty over the same gap, which is twenty dollars.
- The bidder offers seventeen dollars against a market price of twelve.
- Seventeen over twelve, less one, is a premium of about forty one point seven per cent.
- And twenty less seventeen leaves three dollars a share on the table for the bidder, if the retained cash can be released.
- That is what controlling the cash is worth.

13 The trap: dividends need not equal FCFE

- Dividends are a choice, FCFE is a capacity
- Equal only when the board pays out all the FCFE
- Low payout does not mean low value
- Ask what happens to the cash that is kept

IN THE LESSON

- The common trap is to assume dividends and free cash flow to equity must be the same.
- They almost never are.
- A company can pay out more than it generates, funding the gap by borrowing, or less, building up cash.
- When a firm pays out roughly its free cash flow to equity, the dividend model and the F C F E model give similar values.
- When it pays out far less, the two diverge, and the right choice depends on whose view you take.
- Do not conclude that a low payer is worth little, either.
- Ask what happens to the cash it keeps.
- If the money is invested well, it raises future flows.
- If it sits idle, the minority holder loses and a bidder gains.

14 The ladder: many starting rungs, one top

- Net income: after interest and after tax
- EBIT: before interest, after tax not yet taken
- EBITDA: before depreciation as well
- CFO: includes non-cash items and working capital

IN THE LESSON

- Next topic.
- In a vignette you are rarely handed free cash flow.
- You get an income statement, a cash flow statement and some notes, and you must climb to free cash flow from whichever rung you are given.
- There are four common starting lines.
- Net income, which is after interest and after tax.
- E B I T, earnings before interest and tax.
- E B I T D A, which is E B I T before depreciation and amortisation as well.
- And cash flow from operations, the C F O in the cash flow statement.
- Each sits a different distance from free cash flow, and each needs its own adjustments.
- The test of a correct climb is that every starting point lands on the same free cash flow to the firm.

15 FCFF from net income

FCFF = NI + NCC + Int(1 − t) − FCInv − WCInv

Net income	Profit after interest and tax
Non-cash charges	Depreciation, impairments
After-tax interest	Interest × (1 − tax rate)
Fixed capital investment	Spending less sale proceeds
Working capital investment	Rise in working capital

IN THE LESSON

- Start with net income.
- Free cash flow to the firm equals net income, plus non-cash charges, plus interest times one minus the tax rate, minus fixed capital investment, minus working capital investment.
- Go term by term.
- Net income is profit after everything.
- Non-cash charges, such as depreciation, amortisation and impairments, reduced profit without any cash leaving, so they are added back.
- Interest after tax goes back too, because net income is what is left after paying lenders, but F C F F is the cash available before lenders.
- Then take away the two investments.
- Fixed capital investment is capital spending less sale proceeds.
- Working capital investment is the rise in operating working capital.

16 Why interest goes back after tax

- Add interest back after tax: interest × (1 − t)
- Interest saved tax, and that cash stays in the firm
- Working capital leaves out cash and short-term debt
- A rise in working capital uses cash

IN THE LESSON

- Two details cause most of the lost marks.
- First, interest.
- It is a payment to lenders, and F C F F is the cash before lenders are paid, so we add it back.
- But interest also saved tax, because it reduced taxable profit.
- That saving is real cash for the firm, and the lenders do not receive it.
- So we add back only the interest after tax, interest times one minus the tax rate.
- Interest of sixty at twenty five per cent tax becomes forty five.
- Second, working capital.
- It means operating current assets less operating current liabilities, so cash and short-term debt are left out.
- If this working capital rises, cash is tied up in stock and debtors, and it is a use of cash, not a source.

17 FCFF from EBIT and EBITDA

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

EBIT	Before interest and tax
EBITDA	Before depreciation too
Depreciation	Non-cash, but cuts tax
Tax rate, t	Taxes the operating profit
Both investments	Fixed plus working capital

IN THE LESSON

- Starting higher up the income statement is easier, because interest was never taken out.
- From E B I T, multiply by one minus the tax rate, which taxes the operating profit, then add depreciation back and subtract the two investments.
- From E B I T D A there is a catch.
- If you tax the whole of E B I T D A, you tax a profit that depreciation has not yet reduced.
- But depreciation is deductible, so it saves tax equal to depreciation times the tax rate.
- So after taxing E B I T D A at one minus t, we add back depreciation times t.
- Forget that last term and you understate free cash flow.

18 From cash flow from operations, and on to FCFE

FCFF = CFO + Int(1 − t) − FCInv
FCFE = FCFF − Int(1 − t) + Net borrowing

Cash flow from operations	Includes working capital change
After-tax interest	Interest × (1 − tax rate)
Fixed capital investment	Spending less sale proceeds
Net borrowing	New debt less repayments

IN THE LESSON

- The last rung is cash flow from operations.
- It already includes the non-cash items, because it starts from net income and adds them back, and it already includes the change in working capital.
- So we need only two adjustments.
- Add interest after tax, if interest paid was deducted inside it, and subtract fixed capital investment.
- That gives free cash flow to the firm.
- To move on to equity, subtract the after-tax interest again, since lenders are paid first, and add net borrowing.
- The two steps cancel the interest, so free cash flow to equity equals cash flow from operations, less fixed capital investment, plus net borrowing, when interest sits inside it.

19 Example 3: Kestrel's income statement

Kestrel next year, $m. Interest 60, tax 25%, depreciation 120

EBITDA		**560**
EBIT	560 − 120	**440**
Net income	(440 − 60) × 0.75	**285**
CFO (US GAAP)	285 + 120 − 25	**380**
Both investments	fixed 180, working 25	**205**

IN THE LESSON

- Back to Kestrel, for next year, in millions of dollars.
- E B I T D A is five hundred and sixty.
- Depreciation is one hundred and twenty, so E B I T is four hundred and forty.
- Interest is sixty.
- Taxable profit is three hundred and eighty, and at twenty five per cent tax, net income is two hundred and eighty five.
- Fixed capital investment is one hundred and eighty, working capital investment is twenty five, so both together come to two hundred and five.
- Finally, under U S G A A P, cash flow from operations is net income plus depreciation less working capital investment, which is three hundred and eighty.
- Net borrowing is forty.
- Now climb.

20 Four starting lines, one finishing line

Amount ($m)

Net income	**285**
EBIT	**440**
EBITDA	**560**
CFO	**380**
FCFF	**245**

IN THE LESSON

- Here is the picture.
- Each bar is a starting figure from Kestrel's statements, and the last bar is where we must end up, free cash flow to the firm of two hundred and forty five.
- The gap between a bar and the last bar is the work you have to do.
- Net income, at two hundred and eighty five, is already after interest, so it needs the interest put back.
- E B I T, at four hundred and forty, needs the tax taken off and depreciation put back.
- E B I T D A, at five hundred and sixty, is the furthest away.
- Cash flow from operations, at three hundred and eighty, needs the fewest adjustments, because it has done most of the work already.

21 Example 3: four climbs, one answer

Every route must give the same FCFF ($m)

From net income	285 + 120 + 45 − 180 − 25	**245**
From EBIT	330 + 120 − 180 − 25	**245**
From EBITDA	420 + 30 − 180 − 25	**245**
From CFO	380 + 45 − 180	**245**
FCFE	245 − 45 + 40	**240**

IN THE LESSON

- Now do the four climbs.
- From net income: two hundred and eighty five, plus depreciation one hundred and twenty, plus interest after tax forty five, less fixed capital one hundred and eighty, less working capital twenty five.
- That is two hundred and forty five.
- From E B I T: four hundred and forty times zero point seven five is three hundred and thirty, plus one hundred and twenty, less one eighty and twenty five, again two hundred and forty five.
- From E B I T D A: five sixty times zero point seven five is four twenty, plus depreciation times tax, thirty, less the investments, two hundred and forty five.
- From cash flow from operations: three eighty plus forty five less one eighty, two hundred and forty five.
- Finally, equity: two forty five less forty five plus forty is two hundred and forty.

22 Watch where interest paid is classified

- US GAAP: interest paid sits inside CFO
- Add interest back, after tax, exactly once
- IFRS may put interest paid in financing
- Then CFO is before interest: add nothing back

IN THE LESSON

- There is one more catch with the cash flow from operations route, and it is about accounting rules.
- Under U S G A A P, interest paid is an operating item, so it is already deducted inside cash flow from operations.
- That is why we add it back after tax.
- Under I F R S, a company may choose to show interest paid under financing activities instead.
- Then cash flow from operations is already before interest, and there is nothing to add back.
- Adding it again would count the interest twice.
- Always check the classification in the notes before you use this route.
- If you are unsure, the net income or E B I T route is safer, because they do not depend on it.

23 Example 4: the same CFO under two rules

Dunmore Foods, $m: CFO 300, interest 30, tax 25%, FCInv 120

US GAAP: interest inside CFO	300 + 22.5 − 120	**202.5**
IFRS: interest in financing	300 − 120	**180**
IFRS with a wrong add-back	300 + 22.5 − 120	**202.5**

IN THE LESSON

- Dunmore Foods, another made-up firm, reports cash flow from operations of three hundred million.
- Interest is thirty and the tax rate is twenty five per cent, so interest after tax is twenty two point five.
- Fixed capital investment is one hundred and twenty.
- Case one: Dunmore reports under U S G A A P, so interest is inside the figure.
- Three hundred plus twenty two point five, less one twenty, gives two hundred and two point five.
- Case two: Dunmore reports under I F R S with interest in financing, so the figure is already before interest.
- Three hundred less one twenty is one hundred and eighty.
- Adding the interest anyway would give two hundred and two point five, an overstatement of twenty two point five.

24 Common mistakes so far

- Mixing measure and rate: FCFE at the WACC
- Forgetting debt on FCFF, or subtracting it on FCFE
- Thinking dividends must equal FCFE
- Adding interest back before tax
- Ignoring where interest paid is classified

IN THE LESSON

- Time to pause and collect the slips we have met.
- One: pairing a cash flow with the wrong rate, F C F E at the W A C C or F C F F at the cost of equity.
- Two: finishing an F C F F valuation and forgetting to subtract debt to reach equity, or the reverse, subtracting debt from an F C F E value, where debt has already been dealt with.
- Three: assuming dividends and F C F E are the same thing.
- Four: adding interest back before tax instead of after tax.
- Five: using the cash flow from operations route without checking whether interest paid is already inside it.
- These five are the traps examiners like best.

25 Building the calculation, piece by piece

- Non-cash: add depreciation, impairments; deduct gains
- Fixed capital = capital spending − sale proceeds
- Working capital = rise in assets − rise in liabilities
- Interest after tax; net borrowing = new debt − repaid

IN THE LESSON

- Now we put it all into a routine for working out free cash flow.
- First, gather the non-cash charges: depreciation, amortisation and impairments are added back, but a gain on selling an asset is deducted, because the gain is in net income yet the cash from the sale belongs under investment.
- Second, fixed capital investment is capital spending less the proceeds from asset sales.
- Third, working capital investment is the rise in current assets excluding cash, less the rise in current liabilities excluding short-term debt.
- Fourth, interest after tax.
- Fifth, net borrowing, which is new debt less debt repaid.
- Put them into the formula and check by a second route.

26 FCFE, straight from net income

FCFE = NI + NCC − FCInv − WCInv + Net borrowing

Net income	Profit after interest and tax
Non-cash charges	Add back, deduct gains
Fixed capital investment	Spending less sale proceeds
Working capital investment	Rise in working capital
Net borrowing	New debt less repayments

IN THE LESSON

- For free cash flow to equity there is a shorter road.
- Free cash flow to equity equals net income, plus non-cash charges, minus fixed capital investment, minus working capital investment, plus net borrowing.
- Notice that interest has vanished from the list.
- Net income is already after interest, and equity holders really do bear it, so there is nothing to add back.
- The only financing item is net borrowing.
- This is exactly the long way round, free cash flow to the firm less interest after tax plus net borrowing, with the interest terms cancelling.
- The two forms must agree, and agreement is your check that you made no slip.

27 Example 5: Marlow Tools, the data

Marlow Tools, $m. Interest 30, tax 25%, net borrowing 35

Net income		**210**
Non-cash charges	depreciation 80, impairment 10	**90**
Gain on sale	in net income, pre-tax	**25**
Capex and sale proceeds	150 spent, 60 received	**150 / 60**
Working capital	assets +45, liabilities +20	**45 / 20**

IN THE LESSON

- A harder case, with all the details a vignette can throw in.
- Marlow Tools is another made-up firm.
- Net income is two hundred and ten million.
- Depreciation is eighty and there is an impairment of ten.
- Net income includes a gain on selling old equipment of twenty five before tax.
- Capital spending is one hundred and fifty, and sale proceeds are sixty.
- Current assets excluding cash rose by forty five, and current liabilities excluding short-term debt rose by twenty.
- Interest is thirty, the tax rate is twenty five per cent, and the company borrowed a net thirty five.
- We have to find free cash flow to the firm and to equity.

28 Example 5, step 1: the four adjustments

Step 1: the pieces ($m)

Non-cash, net	80 + 10 − 25	**65**
Fixed capital investment	150 − 60	**90**
Working capital investment	45 − 20	**25**
Interest after tax	30 × 0.75	**22.5**

IN THE LESSON

- Step one, the adjustments.
- Non-cash items: depreciation eighty plus impairment ten is ninety, less the gain of twenty five, so a net sixty five.
- We deduct the gain because it flatters net income, and the cash from the sale shows up in the next line.
- Fixed capital investment: capital spending one hundred and fifty, less sale proceeds sixty, so ninety.
- Working capital investment: rise in operating assets forty five, less rise in operating liabilities twenty, so twenty five, and because it rose, it is a use of cash.
- Last, interest after tax: thirty times zero point seven five, twenty two point five.

29 Example 5, step 2: FCFF and FCFE

Step 2: put the pieces together ($m)

FCFF	210 + 65 + 22.5 − 90 − 25	**182.5**
FCFF check from CFO	250 + 22.5 − 90	**182.5**
FCFE from FCFF	182.5 − 22.5 + 35	**195**
FCFE direct	210 + 65 − 90 − 25 + 35	**195**

IN THE LESSON

- Step two, assemble.
- Free cash flow to the firm is net income two hundred and ten, plus sixty five, plus twenty two point five, less ninety, less twenty five.
- That is one hundred and eighty two point five.
- Free cash flow to equity is that figure, less interest after tax of twenty two point five, plus net borrowing of thirty five, which is one hundred and ninety five.
- Now the check, by the direct formula: two ten, plus sixty five, less ninety, less twenty five, plus thirty five, again one hundred and ninety five.
- And by the cash flow from operations route: that figure is two ten plus sixty five less twenty five, two hundred and fifty, and two fifty plus twenty two point five less ninety is one eighty two point five.
- All routes agree.

30 Example 5, step 3: what the slips cost

Marlow's FCFF, correct and with a slip ($m)

Correct		**182.5**
Interest added pre-tax	30 instead of 22.5	**190**
Gain left in	non-cash 90, not 65	**207.5**
Working capital rise as source	+25 instead of −25	**232.5**

IN THE LESSON

- Finally, see what the classic slips do to Marlow's free cash flow to the firm.
- The correct answer is one hundred and eighty two point five.
- Slip one: add interest back before tax, thirty rather than twenty two point five.
- The answer rises by seven point five, to one hundred and ninety.
- Slip two: treat the rise in working capital as a source of cash.
- The twenty five is added instead of subtracted, a swing of fifty, and the answer becomes two hundred and thirty two point five.
- Slip three: leave the gain in, so the non-cash items are ninety instead of sixty five.
- That adds twenty five, giving two hundred and seven point five.
- Each looks small on the page, and each moves the value.

31 Recap

- FCFF at the WACC, then take off debt
- FCFE at the cost of equity: equity directly
- FCFE: the owner's view; dividends: the board's
- Every route gives the same FCFF: interest after tax

IN THE LESSON

- Let us gather it up.
- F C F F is the cash available to lenders and shareholders together, discounted at the W A C C to give firm value, from which we subtract debt.
- F C F E is the cash left for shareholders after the lenders, discounted at the cost of equity to give equity value directly.
- F C F E takes the view of an owner who can decide what happens to cash, so it reflects control, and it is not the same as dividends.
- To climb from net income, E B I T, E B I T D A or cash flow from operations, make the right adjustments once each, and every route must agree.
- Interest goes back after tax, and a rise in working capital is a use of cash.

32 Try three quick questions

1. EBIT 200, t 30%, dep 50, FCInv 60, WCInv 20. FCFF?
   Answer: 200 × 0.7 + 50 − 60 − 20 = 110.
2. FCFF 300, interest 40, t 25%, net borrowing 20. FCFE?
   Answer: 300 − 40 × 0.75 + 20 = 290.
3. FCFE 1.80, dividend 1.00, r 9%, g 3%. Control value?
   Answer: 1.80 ÷ 0.06 = $30.00 (minority: $16.67).

IN THE LESSON

- Now try three quick questions.
- Pause after each one.
- Question one.
- E B I T is two hundred, tax is thirty per cent, depreciation is fifty, fixed capital investment is sixty and working capital investment is twenty.
- What is free cash flow to the firm?
- Two hundred times zero point seven is one forty, plus fifty, less eighty, one hundred and ten.
- Question two.
- Free cash flow to the firm is three hundred, interest is forty, tax is twenty five per cent and net borrowing is twenty.
- What is free cash flow to equity?
- Forty times zero point seven five is thirty.
- Three hundred less thirty plus twenty is two hundred and ninety.
- Question three.
- Free cash flow to equity per share is one eighty, the dividend is one dollar, required return nine per cent and growth three per cent.
- What is the value to a controlling owner?
- One eighty over zero point zero six is thirty dollars, against sixteen sixty seven for the minority.