Corporate Finance

Curated undergraduate study track (not accredited, no external exam). Original explanations and practice only, following the reviewed course handout.

One raise, five years, one habit

- Nimbus Kitchen raises 60,000 for the second site - one project runs the course.
- The habit - a pound today is not a pound tomorrow; **every comparison at one date**.

Time value: four movements, one rate

Four movements, one rate: 8%

DISCOUNT

10,000 in year 3 — **7,938 today**

$PV = FV/(1+r)^n$

ANNUITY

4,000 a year, 5 years — **15,971 today**

$C[1-(1+r)^{-n}]/r$

COMPOUND

6,000 today — **6,998 in year 2**

$FV = PV(1+r)^n$

PERPETUITY

2,400 a year, for ever — **30,000 today**

C/r

monthly rests: 8.30% effective

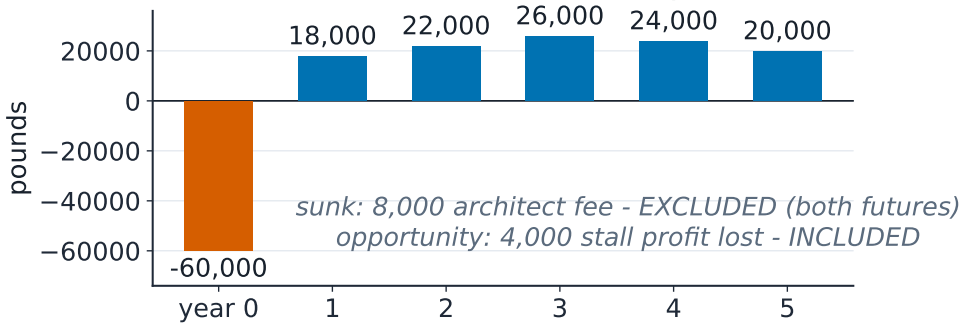
Discount, compound, **annuity** and **perpetuity** at 8%.

Time value in action: the mortgage trap

1. **Quote** 8% nominal, 12 rests: monthly 0.667% - the borrower hears 8.
2. **Truth** $(1 + 0.08/12)\hat{}12$ - $1 = 8.30\%$ effective - roughly 180 a year of extra interest on 60,000.
3. **Rule** Match the rate to the frequency - monthly cash, monthly rate - or convert the rate once and stay consistent.

Cash flows: the list is the craft

Incremental cash flows: because of the project, after tax, in cash

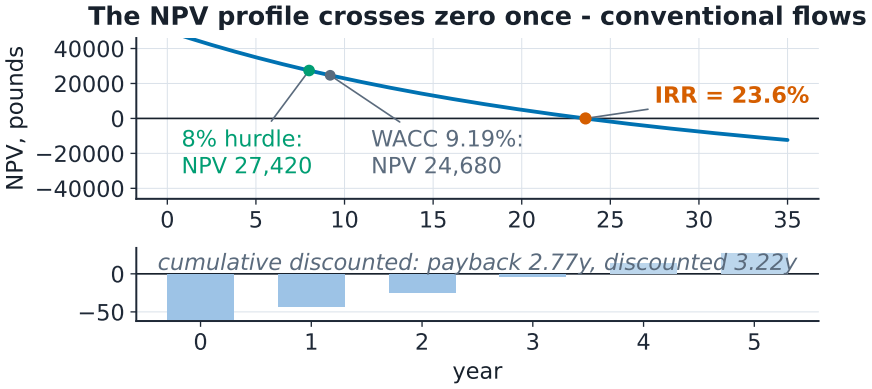


Relevant flows: sunk fee out, **opportunity cost** in, working capital returned.

Cash flows in action: the architect grief

1. **Both** The 8,000 appears with the site AND without it - it differences to zero.
2. **NPV** Include it and the NPV falls by exactly 0 - grief is not a cash flow.
3. **Enter** The 4,000 stall profit (lost) and the 1,200 festival diversion (lost) - the because-of cash is in, negative.

Appraisal: NPV is the referee

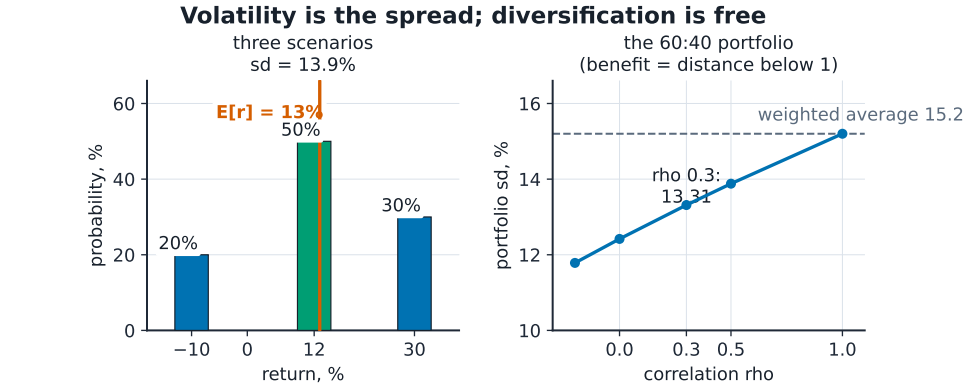


IRR 23.6%; NPV 27,420 at 8% and 24,680 at the 9.19% WACC.

Appraisal in action: the scale lesson

1. **Rank** IRR prefers C (26.6 beats 23.6) - the percentage looks better.
2. **Decide** NPV prefers A: 27,420 pounds beats 1,204 pounds - and pounds are the value.
3. **Why** IRR has no memory of scale: a higher rate on 5,000 loses to a lower rate on 60,000.

Risk: the free lunch and its knife



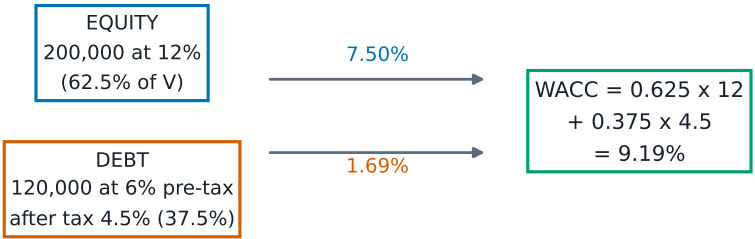
E[r] 13.0%, sd 13.9%; **diversification** shrinks as correlation rises.

Risk in action: pricing the second site

1. **Feel** The founder bears everything - the chef, the lease, the location. It feels like a big premium.
2. **Portfolio** A diversified investor holds many sites: the **specific risk** sheds, and only the systematic slice remains.
3. **Price** The market pays for the slice it cannot shed - which is why the hurdle is the WACC, not the site total.

Cost of capital: the honest hurdle

The hurdle is a blend of market values



previously assumed 8%: every NPV was 2,740 too fat;
the proxy working: k_e = 4 + 1.1 x 6 + 1.4 private

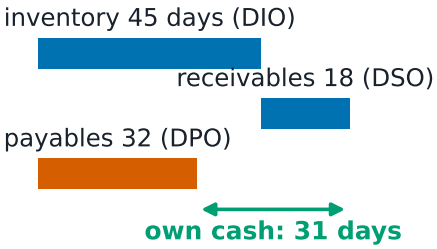
Equity 12% and after-tax debt 4.5% at 62.5/37.5 give WACC 9.19%.

Cost of capital in action: the U-curve

1. **Fall** More debt lowers the blend at first - at D = 240,000 the WACC reads 7.91%.
2. **Rise** But equity beta climbs toward 1.5 and the next tranche prices at 8% - the curve turns.
3. **Bottom** The minimum of the U is the right amount of debt - a balance-sheet fact, not a borrowing maximum.

Working capital: the cash the growth eats

The 31-day bridge of own cash



CCC = 45 + 18 - 32 = 31 days of sales tied up

Overtrading, one table

sales	100	**160**
NWC/sales	20%	**25%**
NWC	24,000	**48,000**

NWC DOUBLES
(1.6 x 1.25)

sales +60%, not +60% cash

A 31-day cash cycle; 60% growth doubles working capital.

Working capital in action: the rescue pack

1. **Fast** DSO 18 to 12: releases 4,200. DPO 32 to 35 honestly: releases 2,100.
2. **Slow** Permanent capital: the mix 24,000 debt at 4.5 + 36,000 equity at 12 = 9.0 blended, terms matched.
3. **Lesson** Profitable and insolvent at once is not a paradox - it is the cycle times the growth times the ratio.

The project sheet, reproducible

1. **Flows** -60,000; +18,000; +22,000; +26,000; +24,000; +20,000 - sunk out, opportunity in, WC both ends.
2. **Verdicts** NPV 27,420 at 8, 24,680 at 9.19; IRR 23.6; payback 2.77 / 3.22; E[r] 13.0 sd 13.9; WACC 9.19; CCC 31.
3. **Standard** A reader with a calculator can check any number - that is the bar.

Check yourself

- The four movements at 8%? (7,938 / 6,998 / 15,971 / 30,000.)
- The NPV and the IRR? (27,420 at 8%; 23.6%.)
- E[r] and sd of the scenarios? (13.0% and 13.9%.)
- WACC and the cycle? (9.19%; 31 days, doubling to 48,000 on growth.)