9.3 Investment appraisal

Name: _____ Class: _____ Date: _____ **Total: 12 marks**

KEY WORDS net present value • internal rate of return

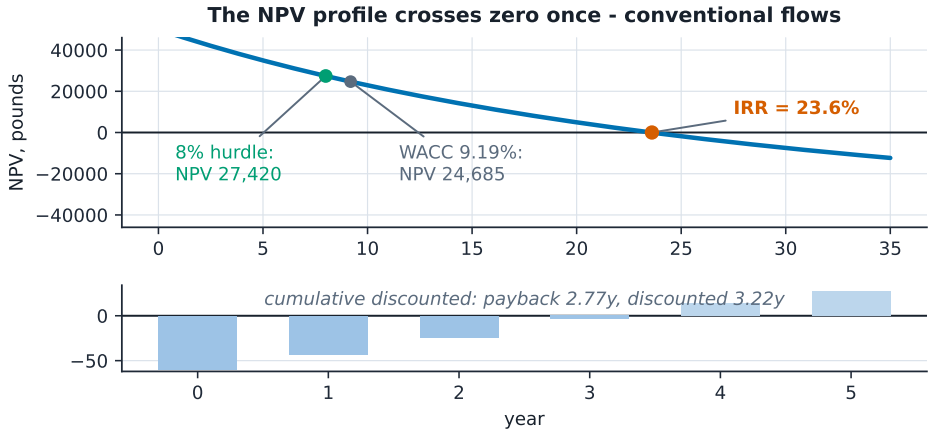
Objective

Compute NPV, IRR and payback with correct conventions; rank projects by NPV; state what each rule answers.

1 Key knowledge and worked examples

■ The referee and the commentary

NPV decides (pounds today); IRR summarises (a rate); payback notes exposure (years). Rank mutually exclusive projects by NPV – IRR ignores scale.



The profile crosses zero once

■ Worked example. The second site

NPV@8% 27,420; @9.19% 24,685; IRR 23.6%; payback 2.77y, discounted 3.22y ✓ – all three quoted, NPV decides.

2 Practice

A bakery oven: −28,000; +9,000; +11,000; +12,000; +10,000 (years 1–4). The firm's cost of capital is 10%.

2.1 Compute the NPV at 10% (nearest pound). [3]

2.2 The IRR is 18.0% and payback is 2.67 years – verify the payback, showing the cumulative recoveries. [3]

2.3 A rival project needs −6,000 and returns 2,400 a year for four years: NPV 1,608, IRR 21.9%. Which project does the firm choose if only one fits, and which rule says so? [3]

2.4 In one line each: what question does each of the three rules answer? [3]

Solutions

2.1

- 9,000/1.1 + 11,000/1.21 + 12,000/1.331 + 10,000/1.4641.
- = 8,182 + 9,091 + 9,016 + 6,830 = 33,119.
- NPV = 33,119 − 28,000 = £5,119.

2.2

- Cumulative: 9,000; 20,000; 32,000 – 20,000 < 28,000 < 32,000.
- Payback = 2 + 8,000/12,000 = 2.67 years.

2.3

- Both positive NPV; the oven's 5,119 beats the rival's 1,608.
- Choose the oven – NPV says so (pounds of value).
- IRR prefers the rival (21.9%) – IRR ignores scale.

2.4

- NPV: how much richer, in pounds today?
- IRR: what rate of return?
- Payback: how long is the money exposed?

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