

10.3 Investment appraisal

Name: _____ Class: _____ Date: _____

Total: 27 marks

KEY WORDS payback period 回收期 • accounting rate of return 会计回报率 • net present value 净现值
• discounting 折现 • investment appraisal 投资评估

Objective

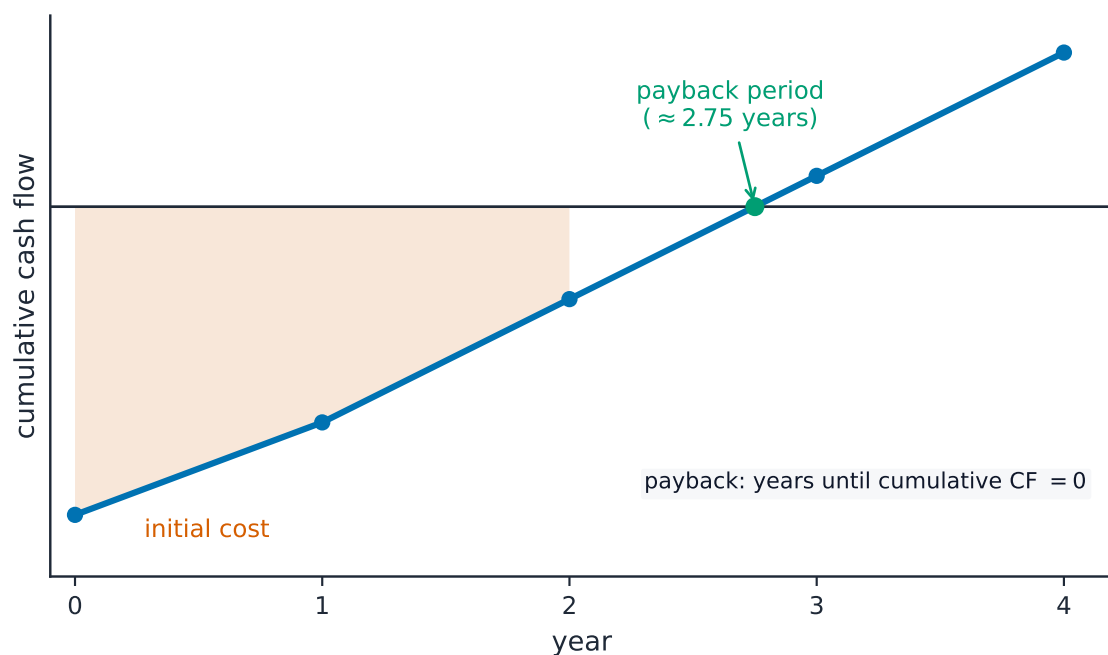
Build the skills to answer exam questions on **investment appraisal** 投资评估 — the **payback period** 回收期, the **accounting rate of return** 会计回报率 (ARR), and **net present value** 净现值 (NPV).

You must be able to:

- calculate the payback period and the ARR
- explain what NPV and discounting recognise
- analyse and evaluate which appraisal method a business should use

1 Worked examples

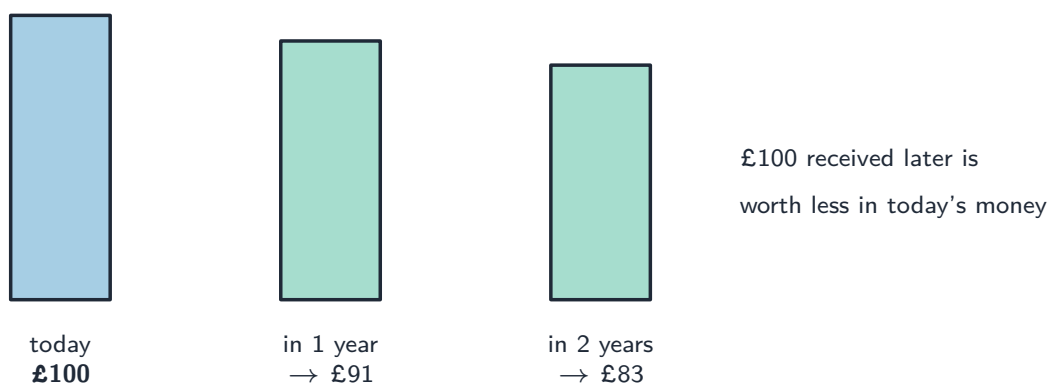
- Appraising an investment



Payback = the time for inflows to repay the initial cost

$$\text{ARR} = \frac{\text{average annual profit}}{\text{initial investment}} \times 100\%$$

- **Worked ARR:** machine costs \$100,000, average annual profit \$25,000 $\rightarrow \frac{25000}{100000} \times 100 = 25\%$.
- **Payback:** count years until cumulative inflows repay the cost; a shorter payback is safer.
- **NPV:** future money is worth less than money today, so **discounting** shrinks future cash flows; a positive NPV adds value.



Discounting (the idea behind NPV): money is worth less the longer you wait for it

Answer shapes: AO1 + AO2 + AO3 (reasoning chain) + AO4 (a supported judgement *in context*).

2 Practice

2.1 Define the term *payback period*. [2]

2.2 A machine costs \$80,000 and earns an average annual profit of \$16,000. Calculate the ARR. [2]

2.3 State what **net present value (NPV)** recognises about future money. [2]

3 Exam-style questions

3.1 Explain one benefit to a business of using the **payback** method. [3]

3.2 A project costs \$120,000 and is expected to earn cash inflows of \$50,000 each year.

(a) Calculate the payback period. [3]

(b) Analyse one limitation of using payback alone to judge this project. [3]

[12]

Solutions

Business answers are marked by **level of response** against the assessment objectives: award **AO1** knowledge, **AO2** application, **AO3** analysis and **AO4** evaluation.

2.1 the time it takes for a project's cash inflows to repay its initial cost (2 for a clear definition; 1 for a partial idea).

2.2 $\frac{16,000}{80,000} \times 100\% = 20\%$ (2; award 1 for a correct method with the wrong figure).

2.3 that money received in the future is worth less than the same money today (2 for a clear idea; 1 for a partial idea).

3.1 [3] **AO1** 1 — name a benefit (simple to calculate; focuses on risk; shows how soon cash returns). **AO2** up to 2 — develop it, e.g. a short payback returns the cash quickly → less risk that conditions change → useful for a firm short of cash (2 developed / 1 limited).

3.2 (a) after 2 years \$100,000 is repaid; \$20,000 of the third year's \$50,000 remains → $2 + \frac{20,000}{50,000} = 2.4$ years (3; award marks for correct cumulative working). (b) [3] **AO1/AO2** 1 + **AO3** up to 2 — payback ignores all cash flows **after** the payback point → a project with a slightly longer payback but much higher later returns could be wrongly rejected → it ignores total profitability.

3.3 [12] **AO1** 2 / **AO2** 2 / **AO3** 2 / **AO4** up to 6. **Payback:** simple, risk-focused — but ignores later cash and total profit. **ARR:** shows profitability and is easy to compare — but ignores the timing of cash. **NPV:** most complete (accounts for the time value of money) — but complex and needs a chosen discount rate. Judgement: no single method is best; a firm short of cash may weight payback, while a long-term project suits NPV — the best approach uses more than one method and depends on the firm's priorities.