

Past-paper walk-through

Investment appraisal ■ 10.3

eXercise

Questions in this set

- 9609/31 N25 Q3 ■ 12 marks
- 9609/32 N25 Q3 ■ 22 marks
- 9609/33 N25 Q3 ■ 12 marks

Reading the mark scheme

- **B1** a mark that stands on its own – the point is either made or not.
- **M1** a *method* mark: the right approach, even if the number is wrong.
- **A1** an *answer* mark, and it usually needs its M mark first.
- **C1** a working mark on the way to the answer.
- **//** separates answers the examiner accepts equally.
- **ecf** = error carried forward: a later part is marked on your own earlier answer.
- **owtte** = “or words to that effect” – the wording need not match.

Question 3

9609/31 N25 ■ Q3 ■ 12 marks

- 3 (a)** Using the data in Table 1.3, calculate the payback period for PPP's proposed new machine.

Question 3

- (b)** Using the data in Table 1.3, calculate the accounting rate of return (ARR) for PPP's proposed new machine.

Question 3

(c) Evaluate whether PPP should invest in the new machine.

Solution 3

(a)

Mark scheme

- Using the data in Table 1.3, calculate the payback period for PPP's proposed new machine.
- Definition of payback: the amount of time it takes for the initial investment cost to be recovered (1 if no valid calculation)
- $(1.9) + 0.5 + 0.6 + 0.8 = 0$ payback is 3 years or 36 months (2)
- $0.5 + 0.6 + 0.8 = 1.9$ (1)
- Correct units needed for full marks – years or months.

Solution 3

(b) Mark scheme

- Using the data in Table 1.3, calculate the accounting rate of return (ARR) for PPP's proposed new machine.
- $\text{ARR} = \text{average annual profit} / \text{average investment} \times 100$ (1 if no valid calculation)
- $\text{ARR} = 0.2 / 0.95 \times 100 = 21.05\% \text{ or } 21.1\% \text{ or } 21\%$ (2)
- Use of 'old' formula $0.2 / 1.9 \times 100 = 10.53\%$ (1)
- Correct units required for full marks – %
- 2

Solution 3

- 9609/31
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Solution 3

(c) Mark scheme

- Evaluate whether PPP should invest in the new machine.
- Level
- AO1 Knowledge
- and
- understanding
- 2 marks
- AO2 Application
- 2 marks

Solution 3

- AO3 Analysis
- 2 marks
- AO4 Evaluation
- 6 marks
- 3
- 5–6 marks
- Developed evaluation in context
- ■
- A developed judgement/conclusion is
- made in the business context.

Solution 3

- ■
- Developed evaluative comments
- which balance some key arguments in
- the business context.
- 2
- 2 marks
- Developed
- knowledge of
- relevant key term(s)
- and/or factor(s) is

Solution 3

- used to answer the
- question.
- 2 marks
- Developed
- application of
- relevant point(s) to
- the business
- context.
- 2 marks
- Developed

Solution 3

- analysis
- that identifies
- connections
- between causes,
- impacts and/or
- consequences.
- 3–4 marks
- Developed evaluation
- ■
- A developed judgement/conclusion is

Solution 3

- made.
- ■
- Developed evaluative comments which
- balance some key arguments.
- Responses may include:
 - AO1 Knowledge and understanding
 - Limited knowledge
 - will be demonstrated through knowledge of one factor in investment decision / knowledge of impacts
 - of process innovation.

Solution 3

- Developed knowledge
- +
- + will be demonstrated through knowledge of two factors in the investment decision /
- impacts of process innovation.
- Knowledge of process innovation and its impacts
- Definition of process innovation: the move to new methods of production, in this case computer-controlled automation.
- Less labour required.
- Knowledge of factors in decision
- ■

Solution 3

- Investment cost.
- ■
- Availability of finance.
- ■
- Impact on employees.
- ■
- ARR and Payback results.
- ■
- Technical economies of scale possible.
- ■

Solution 3

- Reduction in average cost of production.
- ■
- Impact on quality.
- AO2 Application
- Limited application,
- applies knowledge to PPP once.
- Developed application,
- +
- applies knowledge to PPP twice.
- ■

Solution 3

- Payback of 3 years – within 4 years of estimated life.
- ■
- Return of \$800 000 over 4 year period.
- ■
- ARR of 21.05%
- ■
- Cost of machine \$1 900 000
- ■
- NCL are 6 million and gearing is 45 •
- Extra borrowing of \$1.9 m would make gearing $7.9 / 15.2 = 51.97\%$

Solution 3

- ■
- Pies have a shelf-life, therefore over-stocking inadvisable
- 9609/31
- October/November 2025
- AO3 Analysis
- Limited analysis
- – candidate shows one link in the chain of analysis.
- Developed analysis
- – candidate shows two or more links in the chain of analysis.
- ■

Solution 3

- Machine is costly, but the relatively high gearing of PPP increases risk of further borrowing
- causing cash flow
- problems for PPP
- especially if sales fail to increase at the same rate as capacity increase.
- ■
- Employee training to deal with computer automated system will result in increased cost
- , but PPP has a reputation
- for good employee training, which could be boosted by this.
- ■

Solution 3

- Automation leads to increased efficiency
- and therefore eventually increased profits
- .
- ■
- Introducing automation may cause disruption to operations in the short-term reducing output whilst it is installed
- possible damage to reputation if orders are not fulfilled resulting in lower sales.
- ■
- Automation will help PPP fulfil customer orders more quickly resulting in customer satisfaction
- and therefore an

Solution 3

- increase in sales
- ■
- Automation may result in a reduction in the number of employees engaged in production which will reduce operating
- costs
- but this will also result in redundancy payments being made
- ■
- If automation leads to excess stocks, waste may increase
- , which could lead to increased production costs.
- ■

Solution 3

- Work may become more boring for employees resulting in a reduction in motivation and therefore an increase in labour
- turnover
- increasing costs
- 9609/31
- October/November 2025
- AO4 Evaluation
- Limited evaluation
 - – limited supported judgement and/or a weak attempt at evaluative comment
- Developed evaluation

Solution 3

- – supported judgement and/or reasonable evaluative comment
- Developed evaluation in context
- – supported judgement in context and/or reasonable evaluative comment in context.
- ■
- A judgement about whether to invest in automation/process innovation.
- ■
- Elements that the evaluation/judgement might depend on:
- If automation is used, then success greatly depends on increased demand.
- How flexible might the machine be in changing from one type of pie to another?

Solution 3

- How well does automation fit with the 'social objectives' of PPP's employment practices?
- How important might the 'handmade' aspect of PPP's pies be in marketing?
- ■
- Other factors to consider e.g.
- NPV as this considers time value of money.
- Depends on availability of finance linked to relatively high gearing and interest rate.
- How long will it take to install the automated system?
- Will specialist IT employees be required and how expensive is that?
- Opportunity cost of this project.

Solution 3

- ■
- Weighing up of the factors and their relative influence on PPP's decision whether to invest in the new machine
- Accept all valid responses
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Question 3

9609/32 N25 ■ Q3 ■ 22 marks

- 3 (a)** Using the data in Table 1.2, calculate the payback period of the country C location.

Question 3

- (b)** Using the data in Table 1.3, calculate the accounting rate of return (ARR) of the country D location.

Question 3

(c) Evaluate which location KTJ should choose for its new factory.

Solution 3

(a) Mark scheme

- Using the data in Table 1.2, calculate the payback of the country C location.
- Responses may include
- Payback is in the fifth year (1)
- Year
- Net cashflow (\$m)
- Cumulative
- Cashflow
- 0

Solution 3

- (10)
- (10)

Solution 3

(b) Mark scheme

- Using the data in Table 1.3, calculate the accounting rate of return (ARR) of the country D location.
- Responses may include
- $\text{ARR} = \text{Average profit} / \text{average investment} \times 100$ (1)
- $= 2.8 / 12 \times 100 = 23.3\%$ (2)
- Answer of 23.3 or \$23.3 (1 mark only)
- Using alternative ARR equation: $2.8 / 20 \times 100 = 14\%$ (1)
- 2

Solution 3

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Solution 3

(c) Mark scheme

- Evaluate which location KTJ should choose for its new factory.
- Level
- AO1 Knowledge
- and understanding
- 2 marks
- AO2 Application
- 2 marks
- AO3 Analysis

Solution 3

- 2 marks
- AO4 Evaluation 6 marks
- 3
- 5–6 marks
- Developed evaluation in context
- ■
- A developed judgement/conclusion
- is made in the business context.
- ■
- Developed evaluative comments

Solution 3

- which balance some key
- arguments in the business context.
- 2
- 2 marks Developed
- knowledge of
- relevant key term(s)
- and/or factor(s) is
- used to answer the
- question.
- 2 marks Developed

Solution 3

- application of
- relevant point(s) to
- the business
- context.
- 2 marks
- Developed
- analysis that
- identifies
- connections
- between causes,

Solution 3

- impacts and/or
- consequences.
- 3–4 marks
- Developed evaluation
- ■
- A developed judgement/conclusion
- is made.
- ■
- Developed evaluative comments
- which balance some key

Solution 3

- arguments.
- 1
- 1 mark
- Limited knowledge
- of relevant key
- term(s) and/or
- factor(s) is used to
- answer the question.
- 1 mark
- Limited application

Solution 3

- of relevant point(s)
- to the business
- context.
- 1 mark
- Limited analysis
- that identifies
- connections
- between causes,
- impacts and/or
- consequences.

Solution 3

- 1–2 marks
- Limited evaluation
- ■
- A judgement/conclusion is made
- with limited supporting
- comment/evidence.
- ■
- An attempt is made to balance the
- arguments.
- 0

Solution 3

- 0 marks
- No creditable response.
- 0 marks
- No creditable response.
- 0 marks
- No creditable response.
- 0 marks

Solution 3

- No creditable response.
- 12
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- Responses may include:
- AO1 Knowledge and understanding
- Definition of payback / ARR / NPV (max 1 mark for definitions of any or all of these terms)
- Factors in the decision
- ■

Solution 3

- Shorter payback.
- ■
- Higher ARR.
- ■
- Capital cost.
- ■
- Revenue expenditure required.
- ■
- Quality of infrastructure.
- ■

Solution 3

- Access to labour and utilities.
- ■
- Political/legal environment.
- ■
- Quantitative and qualitative factors.
- AO2 Application
- Limited application,
- applies knowledge to KTJ once. Developed application,
- +
- applies knowledge to KTJ twice.

Solution 3

- Application is making use of relevant case information not just repeating it.
- Using data from Tables 1.1, 1.2 and 1.3
- ■
- Country D location is double the capital cost
- ■
- Country C has quicker payback by 9 months
- ■
- Country C has higher ARR by 1.7% points
- ■
- Country C may have lower wages

Solution 3

- ■
- Easier to export from Country D
- ■
- Bigger potential market in Country D
- ■
- Competition between farmers in country C
- ■
- Economies of scale in country D farming of fruit
- ■
- Mission statement regarding sustainability and ethical relationships with farmers.

Solution 3

- 9609/32
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- AO3 Analysis
- Limited analysis
 - – candidate shows one link in the chain of analysis.
- Developed analysis
 - – candidate shows two or more links in the chain of analysis or balance of argument.
- ■
- Country D is a middle-income country and therefore households will have a higher income

Solution 3

- this will result in higher
- sales of juices
- ■
- KTJ juices are a premium product so will be relatively expensive
- so juices may be less affordable in country C
- ■
- leading to lower sales
- ■
- Seaport in country D will facilitate exports of KTJ's juice resulting in higher sales
- and may therefore increase profit

Solution 3

- ■
- Reliable infrastructure in D could reduce delays and protect brand image resulting in higher sales
- .
- ■
- Lower fixed costs in C could improve cash flow reducing risk of liquidity problems for KTJ
- ■
- Economies of scale in D may reduce per-unit costs and therefore increase profit
- .
- AO4 Evaluation

Solution 3

- Limited evaluation
 - – limited supported judgement and/or a weak attempt at evaluative comment.
- Developed evaluation
 - – supported judgement and/or reasonable evaluative comment.
- Developed evaluation in context
 - – supported judgement in context and/or reasonable evaluative comment in context.
- ■
- Supported judgement as to whether country C or D is better.
- ■
- Factors that decision might depend on:

Solution 3

- –
- Ability of KTJ to raise finance for more expensive option.
- –
- Willingness to take risk – electricity supply in country C and additional capital cost in D
- –
- Fit with KTJ's CSR – small farms rather than large scale fruit production
- –
- Importance of profit. C is marginally more profitable than D.
- –

Solution 3

- Depends on KTJ's tolerance for operational risk versus willingness to commit higher capital expenditure
- –
- Country D offers greater stability and scalability but requires larger upfront investment
- –
- Country C better supports CSR positioning but may compromise operational reliability
- –
- A phased investment strategy could balance initial risk with future growth potential

Solution 3

- —
- Decision may be influenced by external factors such as currency movements, access to finance and market growth
- trends
- ■
- Questioning whether Gudaf has the necessary experience / skill to conduct this investment appraisal.
- Accept all valid responses.
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Question 3

9609/33 N25 ■ Q3 ■ 12 marks

- 3 (a)** Using the data in Table 1.1, calculate the payback period.

Question 3

- (b)** Using the data in Table 1.1, calculate the net present value (NPV) over six years discounted at 8%.

Question 3

(c) Evaluate LBM's decision to go ahead with the hot water mine.

Solution 3

(a) Mark scheme

- Using the data in Table 1.1, calculate the payback period.
- Payback period is time taken to recover the initial investment.
- OR
- Initial investment = \$320m.
- OR
- Payback in sixth year (1 mark)
- (no of months = $10/120 * 12 = 1$ month)
- Payback period is 5 years 1 month OR 5.08 years (2 marks)

Solution 3

(b) Mark scheme

- Using the data in Table 1.1, calculate the net present value (NPV) over six years discounted at 8%.
- NPV is the value today of future cash flows net of the original cost of investment.
- OR
- Total discounted net cash flows = \$307.63m
- OR
- Discounted capital cost = \$311.11m (1 mark)
- $\text{NPV} = 307.63 - 311.11 = (\$3.48\text{m})$ (2 marks)

Solution 3

- Accept 3.5
- 2
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Solution 3

(c) Mark scheme

- Evaluate LBM's decision to go ahead with the hot water test mine.
- Leve
- I
- AO1 Knowledge
- and understanding
- 2 marks
- AO2 Application
- 2 marks

Solution 3

- AO3 Analysis
- 2 marks
- AO4 Evaluation
- 6 marks
- 3
- 5–6 marks
- Developed evaluation in context
- ■
- A developed judgement/conclusion
- is made in the business context.

Solution 3

- ■
- Developed evaluative comments
- which balance some key
- arguments in the business context.
- 2
- 2 marks
- Developed
- knowledge of
- relevant key term(s)
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Solution 3

- used to answer the
- question.
- 2 marks
- Developed
- application of
- relevant point(s) to
- the business
- context.
- 2 marks
- Developed

Solution 3

- analysis
- that identifies
- connections
- between causes,
- impacts and/or
- consequences.
- 3–4 marks
- Developed evaluation
- ■
- A developed judgement/conclusion

Solution 3

- is made.
- ■
- Developed evaluative comments
- which balance some key
- arguments.
- Responses may include:
- AO1 Knowledge and understanding
- ■
- Understanding of the use of investment appraisal – payback period, NPV including advantages (quantitative, based on

Solution 3

- data, NPV factors in time value,) and disadvantages (predictions may be inaccurate as circumstances change, false
- sense of accuracy, providers of data may be biased and provide misleading data).
- ■
- Qualitative factors in investment decisions include:
- ■
- Attitude to risk.
- ■
- Impact on stakeholders e.g. environmental/social considerations, future economic changes.
- ■

Solution 3

- How well the project fits the business objectives.
- AO2 Application
- Limited application,
 - applies knowledge to LBM once.
- Developed application,
 - +
 - applies knowledge to LBM twice.
- Application is making use of relevant case information not just repeating it.
- ■
- Quantitative results (Payback 5 years 1 month; NPV –\$3.48m over 6 years).

Solution 3

- ■
- Project life span is 15 years, but cash flows are only appraised for 6 years.
- ■
- LBM has strict finance limitations (no adverse variances allowed).
- ■
- The project has local opposition.
- ■
- The hot water extraction process allows water to be used for heating local housing.
- ■
- LBM is currently losing \$2–3 million per year.

Solution 3

- ■
- Estimated 15 year life span.
- ■
- Uncertain forecasting beyond six years.
- ■
- Non-inclusion of data relating to possible extraction of other metals.
- ■
- Objective of LBM is to produce lithium.
- ■
- Decreasing supply/demand gap (after 2030 demand > supply).

Solution 3

- ■
- LBM only producer in country G.
- ■
- Test mine is the first project, next is hard rock mining.
- ■
- Government concerned to get lithium production in country G,
- ■
- LBM has the finance.
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Solution 3

- AO3 Analysis
- Limited analysis
 - – candidate shows one link in the chain of analysis.
- Developed analysis
 - – candidate shows two or more links in the chain of analysis.
- ■
- The negative NPV (-\$3.48m) over six years suggests the project does not cover its costs of capital and should be
 - rejected
 - , thus ensuring LBM does not deepen its existing losses

Solution 3

- .
- ■
- The project lifespan is 15 years, and the uncounted positive cash flows in Years 7–15, coupled with rapidly rising global
- demand for lithium, could lead to a highly positive overall NP
- , significantly increasing future revenue
- .
- ■
- If LBM experiences adverse variances, they may run out of finance, leading to project failure
- and a loss of the large

Solution 3

- initial investment ($200m+120m$)
- .
- ■
- The dual benefit of extraction and heating local housing may satisfy social objectives and reduce local opposition
- ,
- thereby lowering the risk of delays
- .
- ■
- Learning from this project will enhance performance in future projects, therefore increasing the likely success of the

Solution 3

- hard rock mining project
- ■
- The price of lithium is likely to continue to rise resulting in higher revenues in years 7–15
- .
- ■
- Other producers may appear causing lower lithium prices and therefore reduce forecast net cash flows
- .
- ■
- If other metals can be recovered the revenue figures may be higher than forecast

Solution 3

- .
- AO4 Evaluation
- Limited evaluation
- – limited supported judgement and/or a weak attempt at evaluative comment.
- Developed evaluation
- – supported judgement and/or reasonable evaluative comment.
- Developed evaluation in context
- – supported judgement in context and/or reasonable evaluative comment in
- context.
- ■

Solution 3

- Supported judgement as to whether LBM should proceed.
- ■
- Quantitative investment appraisal indicates the decision is unwise as NPV is negative but likely positive ARR, and NPV
- very close to zero mean qualitative factors may be more important.
- ■
- Factors that decision might depend on:
- —
- Reliability of the estimated cash flows for the remaining 9 years;
- —

Solution 3

- LBM's willingness to accept high financial and operational risk (local opposition, tight budget);
- –
- the importance of social benefits (heating local housing) versus financial return.
- –
- Accuracy of the discount factor and forecast cash flow. In the changing lithium market the indicators are that they
- are possibly neither, but the most likely possibility is that revenues will be higher than forecast.
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Solution 3

- ■
- the risk appears to be low and the finance is available.
- ■
- If LBM does not go ahead, it is likely to go out of business due to increasing losses.
- ■
- The decision is highly subjective due to high uncertainty beyond Year 6. Given that LBM is currently unprofitable and
- operates with tight funding, the negative NPV indicates high risk. However, strategically, LBM must establish mining
- operations to leverage the rapid revenue forecast.

Solution 3

- ■
- The project should probably be delayed or redesigned until LBM can secure sufficient finance to absorb potential
- adverse variances and until a more reliable long-term forecast can demonstrate a clearly positive NPV over the full 15
- years
- Accept all valid responses
- Exemplar L3 Evaluation
- The decision hinges on LBM's risk tolerance and belief in the long-term forecast. While the negative NPV over the

Solution 3

- appraised period suggests that rejecting the project would be financially prudent for a company currently operating at a
- loss, strategically, LBM must establish mining operations to survive and capture future revenue.
- However, the decision is contingent on securing a buffer of finance to tolerate adverse variances. Given the extremely tight
- financial limitations, LBM should consider conducting a sensitivity analysis on the cash flows for years 7–15 to demonstrate
- that the strategic gain outweighs the immediate financial risk. If LBM cannot demonstrate a substantial expected NPV over

Solution 3

- the full 15 years, or if the tight budget cannot be loosened, the project should be delayed until funding is more secure to
- protect the business from insolvency.
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