

MARK PLAN AND EXAMINER'S COMMENTARY

This report includes:

- a summary of the scenario and requirements for each question
- the technical and skills marks available for each part of the requirement
- a description of how skills should be demonstrated
- detailed points for a full answer
- examiner's commentary on candidates' performance

The information set out below was that used to mark the questions. Markers were encouraged to use discretion and to award partial marks where a point was either not explained fully or made by implication.

Question 1 – Demm plc

Scenario

Demm produces paper packaging products used to protect goods during distribution.

Demm sold its plastic division on 1 January 2021 (ie, at the beginning of the year) for £100m and the board is now seeking to use these funds to invest in its paper packaging activities.

A possible investment is in new production machinery controlled by artificial intelligence (AI) to improve the efficiency of paper packaging production. The board is still to decide on this potential investment, as it is concerned about risk and it is unsure of the best timing for the investment. One risk is a potential new market entrant.

Another potential opportunity is a choice between two mutually exclusive sales contracts with major distribution companies.

Demm is concerned about its environmental impact and is considering having an environmental audit performed by an external assurance provider.

Requirements	MARKS (Max) (Headroom)	Skills assessed
<p>1.1</p> <p>(a) Explain and evaluate the benefits and risks of investing in the new AI machinery (Exhibit 3A). Provide a reasoned recommendation that takes account of relevant financial and non-financial issues. Show supporting calculations, including the probability of generating a negative NPV.</p> <p>Ignore the possibility of a new market entrant (Exhibit 3B).</p> <p>(b) Explain how your evaluation in (1)(a) would change when Demm becomes aware of the possibility of Hagg as a new market entrant (Exhibit 3B). Provide reasoned advice to the directors about the decision they should now take regarding the investment in the new AI machinery. Show revised calculations.</p> <p>(c) Assume that Demm invests in the new AI machinery on 1 January 2022, at a cost of £95 million and Hagg enters the market in December 2022.</p> <p>Explain the financial reporting treatment of the AI machinery in Demm’s financial statements for the year ending 31 December 2022. Show supporting calculations. State any assumptions.</p>	<p>27 (31)</p>	<ul style="list-style-type: none"> • Assimilate and structure available data. • Demonstrate an understanding of the information and data provided. • Analyse and assimilate the data in a structured manner (eg, a table). • Carry out data analysis to identify key differences in the relative performance. • Use judgement to distinguish the causal factors for differences in performance. • Demonstrate skills of professional presentation and appropriate language. • Address and articulate the key issues succinctly. • Assimilate new information to provide a reasoned and revised conclusion. • Assimilate and select relevant information to set out and explain the financial reporting treatment consistent with assumptions. • Use judgement and data to assess the need for an impairment loss allowance.

<p>1.2</p> <p>Provide reasoned advice to the Demm board regarding which of the two mutually exclusive sales contracts should be accepted (Exhibit 4). Consider financial and non-financial factors. Show supporting calculations which evaluate returns and risks.</p>	<p>15 (17)</p>	<ul style="list-style-type: none"> • Use judgement to identify and select key issues for each contract. • Demonstrate a clear understanding of the characteristics of the two contracts. • Demonstrate a clear understanding of key risk issues. • Set out structured calculations. • Use judgement to critically appraise each contract. • Understand and assimilate the non-financial information provided to assess the implications for each contract. • Provide a reasoned recommendation.
<p>1.3</p> <p>In respect of Demm’s environmental activities:</p> <p>(a) explain the benefits of the proposed environmental audit engagement for Demm;</p> <p>(b) identify and justify KPIs for Demm to measure its environmental impact; and</p> <p>(c) set out assurance procedures that would reliably evidence these KPIs.</p>	<p>13 (15)</p>	<ul style="list-style-type: none"> • Use judgement to identify and select the key environmental benefits and risks. • Demonstrate a clear understanding of environmental audit issues. • Understand and assimilate the information provided to identify and justify KPIs. • Use judgement to critically appraise the key issues of environmental audit. • Set out structured assurance procedures evidencing each KPI.
<p>Maximum marks</p>	<p>55</p>	
<p>Headroom</p>	<p>63</p>	

Requirement 1**AI machinery calculations (Exhibit 3A and 3B)****3A No new entrant**

	p	£m	EV
Optimistic	0.3	180	54
Most likely	0.5	120	60
Pessimistic	0.2	90	18

PV **132**

Investment

High	0.6	95	57
Low	0.4	75	30

EV outlay **87**

NPV 45

3B New entrant

	p	£m	EV
Optimistic	0.3	117	35.1
Most likely	0.5	78	39
Pessimistic	0.2	58.5	11.7

PV **85.8**

EV outlay **87**

NPV -1.2

		Investment	
		low	high
		0.4	0.6
Optimistic	0.3	0.12	0.18
Most likely	0.5	0.2	0.3
Pessimistic	0.2	0.08	0.12

		Investment	
		Low	high
		0.4	0.6
Optimistic	0.3	0.12	0.18
Most likely	0.5	0.2	0.3
Pessimistic	0.2	0.08	0.12

	PV	Investment outcomes	
		low	high
		75	95
Optimistic	180	105	85
Most likely	120	45	25
Pessimistic	90	15	-5

	PV	Investment outcomes	
		low	high
		75	95
Optimistic	117	42	22
Most likely	78	3	-17
Pessimistic	58.5	-16.5	-36.5

(a) If Hagg does not enter the market (Exhibit 3A)

There is an ENPV of **£45m** if Hagg does not enter the market.

There is a 12% probability of eventually making a negative NPV of **£5m**

A key risk factor is the scale of the project relative to the size of the company. The expected PV is £132m. While this is generated over a five-year period, the scale is significant in comparison to Demm’s profit before tax of £49m in the year ended 31 December 2021.

Aside from scale and the risk of a negative NPV, there are also risks in variations in cash inflows and in the initial investment.

There are also non-financial factors to consider.

Competitive advantage – the use of AI machinery may be part of a learning exercise in expanding the use of AI production more widely in the company. This may have benefits beyond the scope of the cash flows identified for this investment in extending learning into other activities using AI. This may, over time, improve efficiency in production and use of scarce resources.

Environmental targets – could be more easily achieved by the use of AI for more efficient packaging and reduced usage of paper through more bespoke and efficient packaging. Reduce use of virgin paper enhances the sustainability of this natural resource. Reduced use of recycled paper increases the availability of this more environmentally friendly material, making more of it available to substitute for the use of virgin paper.

Conclusion – unless the directors are extremely risk averse to the 12% probability of a negative NPV then, based on the financial and non-financial considerations, this project seems favourable with a £45m ENPV. It also has other strategic and environmental benefits. Based on the information initially available to the project team, it should therefore be accepted.

(b) If Hagg enters the market in 2022 (Exhibit 3B)

There is a negative ENPV of **(£1.2m)** on this project for Demm if Hagg does enter the market in 2022.

There is a 50% probability (0.30 + 0.12 + 0.08) of eventually generating a negative NPV if Hagg does enter the market in 2022. In these circumstances, the negative NPV could be as high as £(36.5)m based on the estimates provided.

The probability of Hagg entering the packaging market in 2022 is 25%. Therefore, if Demm invests in AI machinery on 1 January 2022, the ENPV is:

$$(0.75 \times £45m) + (0.25 \times -£1.2m) = £33.45m$$

There is now a reduced, but still positive, NPV for the investment decision on 1 January 2022, but there are also significant risks.

The risk of a negative NPV is:

$$(0.75 \times 12\%) + (0.25 \times 50\%) = 21.5\%$$

This is a significant increase on the 12% probability before the possible entrance of Hagg was known. This may or may not be acceptable, depending on the directors' risk appetite.

More generally there are now two levels of risk:

- (a) That Hagg enters the market in 2022 after Demm has invested in new machinery on 1 January 2022.
- (b) There is a range of possible outcomes (with or without Hagg entering the market) arising from future variability in packaging market size and variability in the initial outlay.

Advice

The initial advice of making the investment on 1 January 2022 now needs to be reconsidered in light of the new information about the possibility of Hagg entering the market.

Whilst an investment decision at 1 January 2022 still gives a positive NPV, it now needs to be compared with an alternative decision to keep the real option to delay investment until 1 January 2023. This is a policy to 'wait and see' if Hagg enters the market in 2002 and then make the investment decision.

If Hagg does enter the market in 2022, then the advice would be not to invest at 1 January 2023, as there would be a negative NPV.

If Hagg decides not to enter the market in 2022, then the advice would be to invest at 1 January 2023 (or up to that date if Hagg's decision not to enter the market becomes known earlier than 1 January 2023) as the NPV is £45m.

As £45m is much greater than £33.45m, this is the preferred option.

An alternative view is that, at 1 January 2022, the expected value of the delaying the decision to 1 January 2023 can be determined as:

$$(75\% \times £45m) + (25\% \times \text{nil}^*) = £33.75m$$

* ie, the investment will be rejected at 1 January 2023 if Hagg does enter the market in 2022, so the ENPV is nil.

As £33.75m is greater than £33.45m, if only marginally, then keeping the real option and delaying the investment decision until 1 January 2023 is the revised advice. The

real option can then be exercised and the investment decision taken on that date in the knowledge of whether Hagg has, or has not, decided to enter the market.

(c) Impairment

In accordance with IAS36, the entry of Hagg into the packaging market in 2022 can be considered as an indicator of impairment for Demm’s AI machinery in its financial statements for the year ending 31 December 2022.

An assessment therefore needs to be made at 31 December 2022 whether the recoverable amount of the AI machinery has fallen to less than its carrying amount.

The recoverable amount is the higher of:

- its fair value less costs of disposal; and
- its value in use.

As the AI machinery is specialist and has a negligible disposal value, the recoverable amount will be its value in use.

As the AI machinery is operated separately from Demm’s other production activities its costs and revenues are able to be separately identified and this is indicated by the PV estimates for the investment decision. Also, the initial planning horizon is 5 years which is a reasonable period for determining value in use per IAS 36.

At 1 January 2022, the value in use can therefore be calculated in accordance with IAS36 as.

	£m	Probability	EPV
Optimistic	117	0.3	35.1
Most likely	78	0.5	39.0
Pessimistic	58.5	0.2	11.7
Total EPV			85.8

If Hagg entered the packaging market in December 2022 the expected returns on the investment in new machinery occur over the remaining four-year horizon.

Assume:

- there have been no changes forecast market size.
- cash flows occur evenly over the five-year planning horizon.

The annual cash inflow during the four-year period from 1 January 2023 can be calculated at 8% pa annuity as:

$$£85.8m / (AF 5 yrs 8\%)$$

$$= \text{£}85.8\text{m}/3.993$$

$$= \text{£}21,487,603$$

IAS 36 requires the application of the market risk free rate to discount to determine value in use.

$$\begin{aligned} \text{Thus value in use} &= \text{£}21,487,603 \times \text{AF } 4 \text{ yrs } 2\% \\ &= \text{£}21,487,603 \times 3.808 \\ &= \text{£}81,824,792 \end{aligned}$$

The carrying amount at 31 December 2022, before any impairment, is the depreciated cost which is:

$$\begin{aligned} \text{Carrying amount} &= \text{£}95\text{m} \times (4/5) \\ &= \text{£}76\text{m} \end{aligned}$$

Therefore, as the carrying amount is less than the recoverable amount, no impairment charge is needed.

Requirement 2 (Exhibit 4)

$$\underline{\text{Zambesi}} - \text{NPV of contract 1} = \text{£}3\text{m} - \text{£}2.5\text{m} = \text{£}0.5\text{m}$$

$$\underline{\text{Nile}} - \text{NPV of contract 2} = \text{£}4\text{m} - \text{£}3.4\text{m} = \text{£}0.6\text{m}$$

The Nile contract has the higher NPV and, at first sight, it may therefore be seen as preferable.

However, the Nile contract has the higher risk with a standard deviation (SD) of £1.5m compared with a SD of only £0.75m for the Zambesi contract.

It is, however, difficult to interpret the SD without considering its size relative to the size of the PV. The standard deviation may be larger simply because the values of the data driving the PVs in the Nile contract are higher.

A more meaningful measure of relative risk is the coefficient of variation (CoV), which relates the standard deviation to the size of the mean PV. CoV is calculated as the SD divided by the mean PV. Thus:

$$\text{CoV Zambesi} = \text{£}0.75\text{m}/\text{£}3\text{m} = 0.25$$

$$\text{CoV Nile} = \text{£}1.5\text{m}/\text{£}4\text{m} = 0.375$$

It can be seen that, not only does the Nile contract have a higher SD compared with the Zambesi contract in absolute terms, it also has a higher SD relative to the PV generated.

Moreover, the two NPVs have been calculated at the same discount rate of 8% per annum so this has not been adjusted for the relative risks of the two projects. A higher discount rate for the Nile project would reduce the NPV. We do not know the impact of any adjustment in the discount rate or the timing of cash flows, so we do not know the extent to which the NPV of the projects could be affected, but it could conceivably be sufficient to give the Zambesi project the higher NPV.

As Demm is a listed company a more rigorous analysis would be to consider the impact on systematic risk of the two projects by considering the correlation of the SDs with Demm's existing projects and with market returns.

Avoidance of a negative NPV

One of the concerns of the directors is to avoid a negative NPV.

The PV of cash inflow estimates approximate to a normal distribution for both projects and are therefore symmetrical.

Zambesi

There is a 50% probability that the PV of estimated cash inflows will be between £2.5 million and £3.5 million. There is therefore a 25% probability that the PV cash inflows will be below the initial outlay of £2.5m. Therefore, there is a 25% probability that there will be a negative NPV.

Nile

There is a 50% probability that PV cash inflows will fall between £3 million and £5 million. There is therefore a 25% probability that the PV cash inflows will be below £3m.

The initial outlay is £3.4m. Therefore, there is more than a 25% probability that there will be a negative NPV.

Tutorial note: This probability of a negative NPV for Nile can be calculated using normal distribution tables, but this will not be in the syllabus until 2022 so it was sufficient just to identify there is a higher probability of a negative NPV without determining the precise amount.

Renewal of contract

Comparison of NPVs is valid if the contracts are one-off, even though one is a 4-year contract and the other is a 3-year contract.

However, if the contracts are to be renewed every 3 or 4 years then the NPV generated per year is relevant. To determine this, it is necessary to divide by the annuity factors.

Zambesi – NPV/AF (8% for 3 yrs) - Contract 1 = £0.5m/2.577 = £0.194m pa

Nile – NPV/AF (8% for 4 yrs) - Contract 2 = £0.6m/3.312 = £0.181m pa

On this basis, the Zambesi contract generates a higher NPV per annum over the period of the contract. However, there are some underlying assumptions.

It assumes the contracts are going to be renewed on the same terms. It may be that the contract will be renewed, but on different terms which will not generate the same PVs or SDs in future renewal periods.

Also, to compare like with like, they need to be renewed over comparable periods. This could be for indefinite renewal or, more realistically, over comparable total periods, for example 12 years (ie 4 renewals each of 3 years for Zambesi; and 3 renewals each of 4 years for Nile).

Non-financial factors

Beyond the financial calculations above (of return and risk) there are other factors to consider.

Capacity constraints – may be important and in accepting a contract this may reach capacity and prevent acceptance of other contracts creating an opportunity cost. Acceptance of the Zambesi contract may be a problem as there are only two paper mills in the US and Zambesi wants all its products made from recycled paper. This may put pressure on the recycling capacity of the two US mills. However, the average revenue per paper mill is £727m (£4,361m/12) so these contracts are relatively small compared with capacity.

Probability of renewal – the returns from renewal have been calculated, but the probability of renewal is unknown. This may depend on the service level delivery and other non-financial factors. Also, if Zambesi is growing it is more likely to renew contracts and perhaps more likely to renew on favourable terms than Nile which is gradually declining.

Environmental factors – could be a relevant non-financial factor. Zambesi requires packaging made from wholly recycled paper and is therefore more consistent with an improved environmental policy for Demm than Nile, which requires equal amounts of virgin and recycled products.

Advice

Although it is a close judgement in selecting between the two contracts, the Zambesi contract seems preferable as it provides better annualised returns, has lower risk, has better opportunity for future growth, and has a better fit with Demm's environmental policy.

Requirement 3 (Exhibit 5) – Environmental impact

(a) Environmental audit

An environmental and sustainability audit could address:

- an appraisal of Demm’s environment policies and procedures (*processes*)
- an evaluation of how well Demm is reducing its environmental impact and improving the sustainability of natural resource use (*achievements*)
- assessing compliance with external laws and regulations and with internal policies and practices with respect to the environment (*compliance*)
- attesting to the truth and fairness of mandatory and voluntary disclosures by Demm including an environmental report (*public disclosures*)

Key benefits for Demm arising from these audit activities include:

- Builds public trust regarding environmental impact. Attestation of processes and policies enhances trust that Demm is acting in the public interest and attested claims are more believable than self-assessment alone. The paper industry generally is the subject of public scrutiny in respect of environmental issues, so public trust is significant.
- An audit can highlight possible environmental risks (eg, water pollution from paper manufacture). This can enable Demm to take preventative actions and reduce the risk of an environmental event and thereby saving consequent financial costs and avoiding reputation damage.
- Assists regulatory compliance and therefore avoids fines and other regulatory costs from non-compliance (eg, corrective action costs). Demm has paper mills in Europe and the US which cut across regulatory boundaries making compliance difficult to monitor itself.
- Costs can be saved (eg, from more efficient design and use of paper packaging, or lower energy costs).
- Improves transparency for global stakeholders.

(b) KPIs

KPI	Justification
Proportion of recycled paper as a percentage of total paper resources used.	Demm’s recycled paper has a lower environmental impact than virgin paper as it is a reusable resource and avoids cutting down trees which are a natural resource. Currently 40% of paper usage is still virgin for Demm. Only 23% is required by regulation for food use, so a gap exists and can be measured.

Amount of paper used (eg, paper weight per package).	This encourages more efficient use of paper to reduce resource use and decrease costs. Demm's proposed bespoke packaging partnerships can help achieve more efficient use of paper as packaging is designed for purpose.
Recycle time	Demm's current recycle time is 20 days. If this can be reduced, more recycled paper can be made available more quickly to reduce the need for virgin paper.
Number of times recycled	Paper can be recycled a number of times without reducing quality, but ultimately it cannot be used indefinitely. The number of times paper can be recycled increases the use of recycled paper and reduces the need for virgin paper.
Energy and other resources used	Demm's paper mills require power to operate which includes the use of natural resources. More efficient production methods reduce energy use, which in turn reduces environmental impact. Water use is also a key resource in the industry and is a scarce natural resource.
CO ₂ and other greenhouse gas emissions	Demm's paper mills use a manufacturing process which requires power which emits CO ₂ if fossil fuels are used. Measuring CO ₂ and other greenhouse gas emissions may encourage the greater use of renewable energy sources. Demm's CO ₂ emissions include transport as Demm is global also with more demand in the US than US production. Distance to markets could be a measure of transport-based CO ₂ use.
Replanting of trees (ratio of new planting to trees cut down)	Monitoring Demm's suppliers in the supply chain as a measure of sustainable resource use for virgin paper.
Expenditure on environmental policies	Expenditure can be measurable and could include machinery but also training. It can

	<p>also include monitoring internally and up the supply chain.</p> <p>However attributing expenditure which is partly commercial and partly environmental may be difficult. Environmental Management Accounting (EMA) or Environmental Activity-Based Costing may therefore be needed.</p> <p>Aspects of Demm’s proposed new investments, are examples of costs that could be included as environmental costs.</p>
Amount of waste (tonnes)	<p>Reducing waste saves resources and reduces environmental impact. In the paper packaging industry waste can be minimised by the possibility of recycling or selling waste paper.</p> <p>Residual waste can be measured to assess the changing efficiency of Demm’s waste management processes.</p>

(c) Assurance procedures

KPI	Assurance procedures
Proportion of recycled paper as a percentage of total paper resources used.	<ul style="list-style-type: none"> • Inspect and verify records of total paper production (eg, agree to production schedules). • Inspect and verify records of recycled production as a proportion of the total (eg, agree to schedules recording the use and production of recycled products) • Examine internal controls over production records. • Examine disclosures on proportion of recycled products and agree to supporting production documentation • Inspect records of weight of total production and number of packages produced. • Inspect changes in technology and package types produced.
Amount of paper used (eg paper weight per package).	
Recycle time	
Number of times recycled	

	<ul style="list-style-type: none"> • Seek information and explanations from management about compliance with laws and regulations.
Energy and other resources used	<ul style="list-style-type: none"> • Inspect energy usage policies. • Inspect documentation (eg invoices) from energy suppliers. • Inspect payments for energy.
CO ₂ and other greenhouse gas emissions	<ul style="list-style-type: none"> • Examine disclosures made by Demm comparing with fuel consumed and any CO₂ captured. • Inspect supporting evidence from management experts. • Enquire if there is participation in a carbon trading scheme. • Seek assistance from auditor experts if appropriate.
Replanting of trees (ratio new planting to trees cut down)	<ul style="list-style-type: none"> • Examiner records of replanting (internal and external). • Inspect documents of partnership agreement. • Inspect board minutes for evidence of changes in policy. • Review compliance procedures with environmental regulations.
Expenditure on the environmental	<ul style="list-style-type: none"> • Examine evidence of environmental expenditure. • Inspect any Environmental Management Accounting (EMA) procedures or Environmental Activity-Based Costing to attest allocations of costs to environmental activities and other activities. • Attest to supporting evidence.
Amount of waste (tonnes)	<ul style="list-style-type: none"> • Inspect records of total production. • Inspect records of waste v recycled production. • Examine controls over recording waste.

Examiner's comments1.1 Investing in the new AI controlled production machinery

Most candidates performed reasonably well on the first part of this requirement, with a significant number correctly calculating the expected values and the ENPV of the investment in AI machinery as £45m with no new entrant. A minority failed to deduct the correct amount of the investment. The calculations on the probability of a loss were normally correctly carried out by better candidates. However weaker candidates produced a range of incorrect answers or made no attempt at this calculation. Some weaker candidates attempted to spread cash flows over the five-year period, despite being given the present value in the question.

There was some good discussion on the qualitative aspects of the investment which, in many cases, was linked with Demm's overall strategy and the relevant data. This demonstrated an ability to assimilate information of various types from different parts of the question.

The calculations on the expected ENPV if Hagg entered the market varied. Better answers produced the correct calculations. However, other candidates did not see the issues and provided confused calculations, including some candidates who had, in the first part of the requirement, correctly calculated the ENPV without the new entrant. The discussion in better answers was of a good standard in considering the benefits and risks of delaying the initial investment, given the uncertainty about Hagg's entrance, but few noted the concept of the real option.

The answers to the financial reporting part of the question were generally poor. Many candidates just produced the journal entries for recording depreciation and failed to consider impairment at all. Many of those that did consider impairment, only did so in qualitative terms, without any calculations. Only a small minority of candidates attempted to determine a value in use figure to determine the impairment. However, stronger candidates did set out some reasonable calculations to illustrate the impairment issue. The weakest candidates just discussed the AI controlled production machinery as an intangible asset.

1.2 Two mutually exclusive sales contracts

There was some variability in the answers to this requirement. Some good answers were produced, with candidates correctly calculating the NPVs and the co-efficient variant. A majority also referred to the numbers in the question such as linking the standard deviations provided and the relative risks of each contract. Weaker answers produced few calculations and failed to refer the numbers in the questions.

Relatively few candidates considered the difference between the three-year and four-year contracts and even fewer considered annualised values if the contracts were

renewed. Those that did, normally just divided the NPVs by the number of years of the contracts. Although this is wrong, some credit was given for at least considering the issue of differential contract periods where there could be contract renewals.

The non-financial factors discussion produced a range of answers. Some of these were very generic, discussing geographical issues, distribution and exchange rate risk in general terms, instead of focusing on the issues with each of the specific contracts.

Weaker answers tended to polarise between: those with calculations, but little discussion; and those with discussion, but few calculations. Better marks could have been earned in many cases with a more even balance between calculations and discussion.

1.3 Environmental activities

The benefits of an external environmental audit produced some very generic answers which focused on reputation and confidence of stakeholders in broad terms. These answers frequently failed to link these issues to the paper packaging industry in the scenario and to Demm's desire to reduce environmental impact, improve sustainability and that regulatory compliance would ensure Demm's international operations are complaint.

Weaker answers normally did not go into detail about the specific benefits of an environmental audit and instead just referred to the benefits of the underlying environmental activities.

The explanation of the KPIs was generally well done with candidates producing a range of environmental measures around paper usage, recycling time and emissions. However, weaker answers did not then go on to justify why the KPIs were appropriate to Demm and therefore only partially answered the requirement. Some weaker answers merely provided statements of intent and not true KPIs.

The assurance procedures were often not linked to the related KPIs directly. Weaker answers tended to be very generic, for example checking the number of trees replanted and the amount of waste produced, without being specific to the earlier part of the candidate's answer.

Question 2 – Rudder plc

Scenario

Rudder plc is a listed construction company.

It has an opportunity to purchase a prime piece of land for development at a reasonable price. The Rudder board is considering how the land purchase might be financed, but it needs to use borrowing. Five different borrowing methods have been identified by Rudder and the selection of an appropriate mix of these methods is required to finance the land purchase.

A further matter is the dividend decision for 2021. Some of Rudder's directors believe that the planned dividend should be cancelled to provide part of the finance for the land purchase. Other directors want to maintain the dividend at the same level as last year.

A potential ethical issue has arisen regarding possible public disclosures by the marketing director, including his personal trading in Rudder shares.

Requirements	MARKS (Max)	Skills assessed
<p>2.1</p> <p>Advise the board on how Rudder should raise £120 million to finance the purchase of the new land (Exhibit 2) by selecting a mix of borrowing from the five available methods (Exhibit 3). In so doing:</p> <p>(a) Evaluate each method of borrowing by:</p> <ul style="list-style-type: none"> • calculating the annual effective interest rate (where possible) and explaining the cost of borrowing; • assessing the risks; and • setting out and explaining the financial reporting treatment in Rudder’s financial statements for the year ending 31 December 2022. <p>(b) Recommend and justify the most appropriate mix of borrowing to raise the £120 million. Select two or three of the five available borrowing methods.</p>	<p>27</p> <p>(35)</p>	<ul style="list-style-type: none"> • Assimilate and structure available data. • Demonstrate an understanding of the information and data provided. • Analyse and assimilate the data in a structured manner for each loan. • Carry out calculations to determine effective interest rates. • Use judgement to identify key risks for each loan. • Use judgement to distinguish the causal factors for differences in relative risks. • Assimilate data and set out and explain the financial reporting treatment for each method of borrowing. • Assimilate information to provide a reasoned conclusion.

<p>2.2</p> <p>Provide reasoned advice for the Rudder board on whether the 2021 dividend should be cancelled (Exhibit 4). In so doing, evaluate the comments of the operations director and the finance director. Use all relevant available information.</p>	<p>10 (12)</p>	<ul style="list-style-type: none"> • Use judgement to identify and select key issues for and against dividend payment. • Demonstrate a clear understanding of the funding issues relating to a dividend payment in the relevant financing situation. • Use judgement to critically appraise the impact on each stakeholder group. • Understand and assimilate the information provided to assess the implications of each choice. • Assimilate information to relate the dividend decision to the overall financing position of the company, including financing need for the land purchase. • Provide a reasoned recommendation for each proposal.
<p>2.3</p> <p>Set out any ethical issues for Rudder and Matt Tarkle, the marketing director, arising from the matters described by the CEO (Exhibit 5). Recommend the actions that the CEO should take depending on whether Matt is deemed to have acted legally or illegally.</p>	<p>8 (9)</p>	<ul style="list-style-type: none"> • Use ethical language and principles. • Use judgement to identify key ethical issues presenting a balanced approach to interpreting the facts and incentives. • Identify confidentiality, self-interest and honesty as key issues. • Use judgement to distinguish business issues and ethical issues. • Identify key ethical issues for individual directors and their legal duties. • Set out the actions to be taken by the CEO.
<p>Maximum marks</p>	<p>45</p>	
<p>Headroom</p>	<p>56</p>	

Requirement 1 - Borrowing

Method 1: Loan – Alsopp Bank

Effective interest rate

Interest cover for 2021 is currently 3.29 (£46m/£11.2m). This would enable a 4% pa borrowing rate from Alsopp Bank for 2022. However, the loan interest on £120m with any mix of borrowing methods would take Rudder's interest cover below 3 as profits are likely to be constant for the next two years and the landbank will not be developed in that time to generate additional earnings. Interest rates would therefore rise to 4.5% for the final three years of the Alsopp loan.

The effective annual interest rate can be approximated by:

$$[(1.04)(1.045)^3]^{1/4} = 4.374775\% \text{ (approximately } \mathbf{4.375\%})$$

*Tutorial note: other methods of approximation are acceptable or could use =IRR in spreadsheet to give more precise **4.367%***

Risks

- Fair value risk – the risk with fixed rate loans is that if market interest rates fall, then the fair value of the loan instrument will rise as market yields decrease (and vice versa). The market value of the loan is therefore subject to the risk of market interest rate changes.
- Refinancing risks – at the end of four years the loan will need to be refinanced and there are unlikely to be significant cash inflows over the loan term from the new landbank investment, as it will not even commence development until the end of 2024.
- Covenant breach - there may be a number of covenants and a breach may mean the bank, will not only increase the interest rate, but can demand immediate repayment. This may lead to insolvency risk if the repayment cannot be refinanced.
- Cash flow risk - servicing the debt (along with other existing and other new debt) may put pressure on cash flows as the cash balance at 31 December 2021 is estimated to be only £8m.

The fair value risk could be hedged with a Pay-Variable; Receive-Fixed swap, but part of the merit of this method is that it is a different type of risk from the Method 3 variable rate loan.

Financial reporting treatment

The loan would be measured at amortised cost over its term of four years.

If it is reasonably certain from inception of the loan, that the covenant will apply for 2023 then the (approximate) averaged effective annual interest rate would be used in the financial statements for the year ending 31 December 2022:

Interest charge to profit or loss (approximate) = £40m x 4.375% = £1.75m

A non-current liability would be recognised in SFP = £40m + £1.75m – (£40m x 4%)
= £40.15m

Method 2: Loan – Swiss BankEffective interest rate

The nominal interest rate for interest payments only is **1.2%**.

However, risks of changes in exchange rates impacting on the £ equivalent of CHF48m need to be considered, but are unknown at the inception of the loan (see below).

Risks

If the investment is financed with a four-year loan, denominated in CHF, there must be a plan for refinancing at the end of the loan period. However, due to movements in the £:CHF exchange rate over four years, it is not known at inception what this amount will be in £s.

Interest rate parity theory predicts that currency markets will be in equilibrium, so expected differences in relative foreign currency movements would compensate for interest rate differences. If Swiss interest rates are lower than UK rates, then the CHF is likely to strengthen against the £ over the four years to compensate. While Rudder may gain the advantage of lower annual interest payments, the £ equivalent of the CHF48m nominal value of the bond in four years time is likely to be higher than £40m. The risk is that the redemption value is uncertain as it depends on future exchange rate movements. However, this is not a random risk, in efficient markets, the CHF is expected to strengthen against the £ and the redemption value would therefore be greater than £40m.

FOREX hedging is possible, but over a long period of four years it is likely to be difficult and expensive to hedge effectively and fully.

As a result, interest rates and currency movements need to be considered jointly.

Rudder has no Swiss operations generating revenue to naturally hedge the CHF payments.

In addition, the refinancing risks, fair value risks and covenant risks will also apply as for Method 1 above.

Financial reporting treatment

The annual 1.2% interest paid (CHF576,000) would be translated to £s at the average exchange rate each year, per IAS21, as the £ is clearly Rudder's functional currency.

The loan is a monetary liability and so would be retranslated at the end of each financial year, per IAS21. Annual exchange differences would be recognised in profit or loss.

Method 3: Loan – Carstairs Bank

Effective interest rate

The effective interest rate at inception is expected to be **3.4%** pa

However, this is subject to change, as 10-year government bond yields (gilts) will change over the four-year period. The direction of change is uncertain.

Risks

Changes in central bank rates, government policy (eg, quantitative easing) and macroeconomic conditions will all impact on 10-year gilt yields and therefore on the variable interest rates on the Carstairs Bank loan.

There is therefore a key cash flow risk from changes in the variable interest rate. The fair value of the loan will not however change due to market interest rates (this only occurs with fixed rates).

The refinancing risks and covenant risks will also apply as for Method 1 above.

The interest rate risk could be hedged with a Pay-Fixed; Receive-Variable swap, but part of the merit of this method is that it is a different type of risk from the other fixed rate loans and therefore provides some diversification of the type of risk.

Financial reporting treatment

Interest will be recognised as incurred and may fluctuate each year over the four-year period.

A non-current liability would be recognised, which would not normally change from £40m, despite market interest rate changes.

Method 4: Bank loan repayable by instalments

Effective interest rate

The annuity factor for a four year loan is $\text{£}40\text{m}/\text{£}11.019\text{m} = 3.63$

Reading from the annuity tables, this gives an annual interest rate of **4%** over four years.

Risks

A key risk is liquidity risk, as cash repayments of both interest and capital are being made over the term of the loan rather than all the capital being repaid at the end of the loan period. These installment payments are substantial. This is concerning as the investment in the landbank will not give a return until 2025, at the earliest, and will not therefore generate any cash to help repay the loan. The other four methods repay capital at the end of the loan term.

The scale of the loan, relative to the existing company operations, is significant. For example, the first repayment is £11.019m and the current cash balance is only £8m.

Whilst there is not the same refinancing risk at the end of the loan as for other methods, this issue is brought forward by requiring annual repayments of capital as well as interest.

The covenant risks will also apply as for Method 1 above.

Financial reporting treatment

Interest charged to profit or loss	=	£40m x 4%	=	£1.6m
A liability recognised in SFP	=	£40m + £1.6m – £11.019m		
	=	£30.581m		

Method 5: Issue corporate bonds

Effective interest rate

Determined using:

- linear interpolation
- trial and error; or
- =IRR in the spreadsheet in the platform

Effective interest rate is **3.908%**

Proof (not required)

60,000			
0.98	i = 3.908%	1%	
Bal b/f	Interest	Paid	Bal c/f
58,800	2,298	600	60,498
60,498	2,364	600	62,262
62,262	2,433	600	64,095
64,095	2,505	600	66,000

Risks

There is a risk that the bond issue will not be taken up by investors. Underwriting may reduce this risk (and the underwriting fee may be included in the 2% transaction costs).

Timing is tight to take a bond issue to market in less than two months before 31 December 2021, whereas this is a reasonable horizon for a bank loan.

The refinancing risks, fair value risks and covenant risks will also apply as for Method 1 above.

Financial reporting treatment

Interest charged to profit or loss = £58.8m x 3.908% = £2.298m

A liability would be recognised = £58.8m + £2.298m - £0.6m
= £60.498m

Recommendation

£40m Method 1

£40m Method 3

£40m Method 5

Method 2 is rejected as there is high foreign currency risk element giving significant uncertainty over the redemption amount in £s.

Method 4 is rejected as there are earlier repayments of principal over the term of the loan putting further pressure on liquidity.

The mix of Methods 1, 3 and 5 gives a balance between fixed and variable interest rates and between bank loans and publicly issued bonds. Effective interest rates are similar with some uncertainty on Method 3.

Care needs to be exercised about the combination of covenants in the three methods of borrowing, in combination with covenants in existing borrowing, which may create financial inflexibility, including limiting future borrowing.

Requirement 2 – dividend cancellation

The decision of whether to reduce the dividend can be viewed through:

- (1) The general lens of long-term dividend policy and shareholder (and wider stakeholder) relationships.
- (2) The specific shorter-term financing perspective of the purchase of the new land through an increase (at the margin) of £40m debt; or a decrease of £40m equity.

Broadly, the operations director, Wendy West, takes the perspective in (1) above whereas the finance director, Henry Khan, takes the perspective in (2) above.

(1) Dividend policy and shareholder relationships (Operations Director)

The 2021 dividend of £40m, initially agreed by the board, was substantial and is greater than the profit after tax of £23m.

The dividend payout ratio is therefore 174%, which is a distribution which is significantly more than profit. Such a dividend is legally allowed as retained earnings are £247m. Wendy is however wrong to say that 'we can clearly afford to pay the dividend out of the retained earnings of £247 million'. Retained earnings are an accounting reserve and are represented by net assets, but this it does not mean that Rudder has the available cash to pay the dividend. Indeed, Rudder only has £8m cash so it would need, in large part, to debt finance any dividend in excess of this amount.

The dividend yield for 2021 would be 3.88% ($\frac{£40m}{100m \times £10.03}$). This appears reasonable but, despite being the same absolute amount of £40m, it would be an increase compared with the dividend yield for 2020 due to the fall in share price over the year. The 2020 dividend yield, based on the share price at 31 December 2020 was 3.2% ($\frac{£40m}{100m \times £12.50}$).

Nevertheless, the historic long-term pattern of increasing dividends, by approximately 3% pa, may mean shareholders could react unfavourably if dividends are unexpectedly cancelled.

It may be that there are good communications with shareholder groups, as part of good corporate governance. If shareholders are aware that dividends are to be cancelled, then any adverse reaction may already be discounted into the share price. However, as directors have not yet even made the dividend decision, having earlier made a provisional decision to maintain the dividend, it seems unlikely that shareholder groups will be aware of a dividend cancellation. However, they may have anticipated a dividend reduction following the profit warning announcement on 5 October 2021.

The unfavourable shareholder reaction may take the form of corporate governance action (eg votes through the AGM to remove directors). Shareholders are not however legally entitled to vote through a dividend where it is not proposed by directors.

An alternative adverse reaction by shareholders would be for them to sell their shares. If they do this in sufficient numbers, then share price may fall.

There are number of reasons why they may do this:

- The shareholder clientele may have chosen to hold Rudder shares because a reasonably high dividend payout policy suits their financial or tax circumstances, rather than Rudder retaining operating cash flows for reinvestment, leading to greater share price growth. For example, Rudder's pension fund shareholders (making up 46% of shareholders) may prefer dividends to give them regular cash flows to pay pensioners, rather than incur transaction costs through share sales from their portfolio to generate cash.
- Changes in dividends can signal good or bad information. If Rudder decreases its dividend this may be taken as a signal to shareholders, and financial markets generally, that Rudder is unable to sustain its dividend due to poor performance or poor liquidity. An element of this bad news signal may however have already been discounted into the share price following the profit warning announcement on 5 October 2021.

(2) Cancel dividend to help finance the purchase of the new land (Finance Director)

Cancellation of the dividend can be a contribution by equity to the finance of the new land purchase, rather than all £120m be financed through borrowing.

The choice is a question of Pecking Order in selection of finance. This is based on the impact that the amount of surplus cash paid out as dividends has on finance available for investment. Managers have a difficult decision: how much do they pay out to shareholders each year to keep them happy, and what level of funds do they retain in the business to invest in projects such as the land purchase.

However, in the case of Rudder, there is not sufficient surplus cash to meet the requirement to pay a dividend of £40m. There is only estimated to be £8m cash at 31 December 2021 so there is not sufficient cash to pay the £40m dividend in full. If the dividend of £40m were to be paid then an additional £32m borrowing would be required to debt finance the dividend. This is in addition to the finance needed for the investment in the land.

The effects of paying the dividend, or not, can be seen through the impact on gearing (D/E) immediately after buying the land on 1 January 2022.

Cancel dividend:

$$\text{Borrowing} = \frac{(351 + 120)}{497} = 94.7\%$$

Pay £40m dividend: (assume borrow £32m)

$$\text{Borrowing} = \frac{(351 + 120 + 32)}{497 - 40} = 110.1\%$$

The gearing is high at 94.1% even if no dividend is paid. However, if a dividend is paid, then gearing increases to 110.1%. This may increase the cost of debt and the cost of equity.

There may also be covenants on new and existing debt preventing gearing rising above a certain level or preventing dividend payouts when gearing is high or profits low.

There are immediate liquidity constraints on paying a dividend. This is not only the low cash balance and the need to debt finance most of a £40m dividend payment. There is also the need to refinance £190m of the existing debt in June 2024 and to finance the land purchase. This new land will take some time before it starts to be developed to generate cash to improve liquidity. There is therefore a crucial need to preserve cash.

Advice

The purchase of land has been decided, but it creates liquidity issues, so preservation of cash is needed by cancelling the dividend for 2021, and possibly future years. It is therefore recommended to cancel the dividend as a prudent financial measure to enhance Rudder's liquidity and to protect the interests of lenders, employees and other stakeholders.

As a result of the dividend cancellation, good communications are needed with major shareholder groups (the pension funds, insurance companies and private equity) and their representatives as part of good corporate governance and in order to manage their

reactions. More general shareholder communications could be sent to individual shareholders.

Requirement 3 - Ethics

Issue with financial analyst

If possible, establish the facts – the anonymous and self-interested source (financial analyst) casts doubt over the validity of the claims. Matt should not initially be the source of establishing the facts to avoid possible tipping off.

Honesty and integrity – if Matt is deliberately misleading the financial analyst this raises significant issues of his honesty and integrity.

Confidentiality - even if Matt was telling the truth to the financial analyst (or believed he was) then there is a breach of confidentiality.

Self interest - if Matt was deliberately trying to push up share price so he could sell his own shares at a higher price this is a self-interest threat.

Self-interest v fiduciary duty - directors are required to act in the interests of the company. If Matt is passing on confidential information about Rudder, this can damage the company (eg, reputational damage, share price effects) in favour of Matt's own self interests.

Share trading (ignoring issue of financial analyst)

It is legitimate for directors to trade their own shares. Directors have more information than the public to trade at the best time (eg, buying before good news is released; selling before bad news is released). Directors' trading in this way may be putting self-interest before the company's interests. Their trading may also act as a signal to financial markets.

The table of trades shows that Matt bought 27,000 shares shortly before the public announcement of the winning of the new contract in York, but after the date that this was known internally. He therefore gained from the share price rise of £1.40 on the day of announcement.

Conversely, Matt sold 32,000 shares shortly before the public announcement of a profit warning for 2021 financial year. He therefore avoided the £2.60 fall in share price on the day of the announcement.

Although Matt's share trades in 2021 were substantial he still owns 160,000 shares at 31 December 2021 so, if he has sought self-interest, he has not sought to maximum self-interest by selling all his shares. However, this may have been to avoid drawing attention to himself and avoid transparency for his actions.

Actions

Review the legal advice before challenging Matt.

Acting illegally

If the legal advice is that Matt has engaged in fraud or money laundering, then seek further legal advice on how this should be appropriately reported (eg, to SOCE). In this case, Matt should not be challenged or informed of the situation, as this may amount to tipping off.

Examine board minutes and speak to other directors to establish who knew about Matt's share trades and whether they are in breach any directors' agreement on such trades.

Check the terms of Matt's contract of employment to ascertain whether there is a contract breach.

If the shares were awarded as part of a director remunerations scheme check that Matt's actions are consistent with its terms.

Not acting illegally

If the legal advice is that Matt has not acted illegally, then seek an explanation from Matt for: (i) the claimed actions in the anonymous statement (ii) an explanation the nature and timing of his trades in Rudder shares.

Even if Matt has not acted illegally, he may have breached Stock Exchange regulations in the trades themselves or in the nature and timing of the disclosures of his trades to the Stock Exchange so the information can be in the public domain.

The share trades should be disclosed in the Directors' Remuneration Report within the Annual Report.

Summary

Matt is accountable to the board. If Matt has deliberately acted illegally or contrary to Stock Exchange regulations or breached confidentiality (legally or not) then it may be appropriate to ask him to resign.

If Matt has breached internal rules, then these should be disclosed and the board should consider any action.

If there is deemed to be lack of clarity over director share trade procedures, then the board should draw up a formal agreement setting out the conditions, approvals and disclosures required for director share trades and public information disclosures.

Examiner's comments**2.1 Raising £120m in borrowing**

Many candidates did not clearly structure their answers for this requirement. There were three key elements for each financing method: effective interest rate, risks and financial reporting treatment. Those candidates who used these headings for each borrowing method provided a clear structure to their answer, ensuring all parts of the requirement were attempted. Weaker candidates tended to mix or confuse the three elements.

Calculations on the effective annual rate of interest for each borrowing method were generally poor. Many candidates seemed to have little idea of what an effective interest rate is. Some calculated a single interest rate for the whole four-year period, rather than an annual rate. Others expressed interest, not as a rate at all, but as the cash amount of interest paid. Other produced very high rates of interest per annum (eg, over 20%) but lacked the self-reflection or self-criticism to note that this was clearly wrong.

Similarly, with the loan from Alsopp Bank (Method 1) this was a plain vanilla loan at 4%pa, with the risk that it could rise to 4.5% pa if a covenant was breached. A degree of self-reflection by candidates would indicate that the implicit annual interest rate over the four years would be somewhere between 4% and 4.5% and yet many answers were over 10%. Credit was given where candidates stated they had clearly made a mistake in their calculations and then went on to discuss the risks arising from a more realistic interest rate change.

The discussion of the risks of each borrowing method varied in quality and level of detail but there were many good answers. The higher scoring answers looked at finance and business risks relevant to the scenario. For example, considering the possibility of covenant breaches arising from all £120m new debt, not just one method alone. They also considered the impact on gearing, foreign currency, liquidity and interest rate variability of the five methods where appropriate.

The financial reporting element was generally not good. Many candidates made broad descriptive statements about amortised cost, without showing any calculations. Even where calculations were made, they were often basic. For example, regarding the bank loan repayable by instalments, many candidates just made a crude allocation of the total interest cost. Others wanted to charge the transaction costs to profit or loss on the corporate bond. Some candidates calculated the financial reporting treatment over the whole period of the loan, rather than only for the year ending 31 December 2022, as stated in the requirement. This approach did not lose marks, but it did lose time for these candidates.

The recommendation by most candidates was a selection of what they considered to be the best funding methods on an individual basis (ie, each method in turn being

considered in isolation). Few considered how the mix of selected funding methods was balanced. For example, a mix of fixed rate and variable rate borrowing could partially offset fair value risks and cash flow risks.

2.2 Dividend cancellation

A key part of this answer that was often missing was the evaluation of the comments by the operations director and finance director. Some candidates did not refer at all to the directors' comments and others briefly referenced them, whereas stronger answers used this to structure their answers.

Weaker answers to this requirement tended to be general, mainly discussing dividend signaling in general terms and how failure to pay a dividend would affect stakeholder confidence and share price. Many candidates referred to M&M and other aspects of dividend theory, but failed to relate these to the directors' comments.

Weaker candidates also made no reference to the specific data in the question. Typically, where there are numbers in the question, there should be numbers in candidates' answers.

The stronger answers used the qualitative and quantitative information in the question to calculate dividend payout ratios and dividend yield to inform their discussion on how the failure to pay a dividend may be viewed unfavourably, given historic patterns. Better candidates also linked the dividend payment decision to capital structure and the shareholder clientele groups specifically for Rudder, using the information given in the question. Better answers also linked the dividend discussion to the investment in land financing requirement as Rudder's competing needs for cash.

A key point was that Rudder did not have sufficient cash to pay the dividend and hence more borrowing would be needed to largely debt finance the dividend payment. The answers which picked this up tended to score highly as they linked back to Rudder's broader financial position including the need to borrow to purchase the land, which showed the skill to assimilate and link information from different parts of the question.

It was worrying that many candidates at Advanced Level seemed to believe that the dividend could be comfortably paid out of retained earnings, when the company had insufficient cash.

Most candidates provided a reasoned recommendation, although some weaker answers failed to do this.

2.3 Ethics

Whilst there were some answers of a very good standard to this requirement, a high number of candidates automatically assumed that insider trading had taken place.

The scenario made clear that legal advice was being taken. Despite this, many candidates came to their own legal opinion that Matt had acted illegally and jumped to the conclusion that he was guilty of insider trading and based their whole answer around this.

Better answer referred to the data in the question to support their ethical conclusion about whether Matt was acting in his own self-interest. Weaker answer made no reference to the numbers in the question.

The better answers, were also more balanced in their approach, weighing up the facts and the timeline of Matt's dealing in shares and then reflecting on actions for both the scenarios of legal and illegal behaviour.

A significant number of candidates still adopt the transparency, effect and fairness approach to questions without considering any other ethical principles relevant to the scenario.