

INSTITUTE AND FACULTY OF ACTUARIES

EXAMINERS' REPORT

April 2017

Subject SA5 – Finance Specialist Applications

Introduction

The Examiners' Report is written by the Principal Examiner with the aim of helping candidates, both those who are sitting the examination for the first time and using past papers as a revision aid and also those who have previously failed the subject.

The Examiners are charged by Council with examining the published syllabus. The Examiners have access to the Core Reading, which is designed to interpret the syllabus, and will generally base questions around it but are not required to examine the content of Core Reading specifically or exclusively.

For numerical questions the Examiners' preferred approach to the solution is reproduced in this report; other valid approaches are given appropriate credit. For essay-style questions, particularly the open-ended questions in the later subjects, the report may contain more points than the Examiners will expect from a solution that scores full marks.

The report is written based on the legislative and regulatory context pertaining to the date that the examination was set. Candidates should take into account the possibility that circumstances may have changed if using these reports for revision.

Luke Hatter
Chair of the Board of Examiners
July 2017

A. General comments on the *aims of this subject and how it is marked*

1. The aim of the Finance Specialist Applications subject is to instil in successful candidates the ability to apply knowledge of the United Kingdom financial environment and the principles of actuarial practice to the financial management of clients' affairs.
2. The SA5 exam generally requires bullet point form or short form essay style answers that apply general principles to directly address specific circumstances. The answers given below are the most suitable but are just one possible set of acceptable answers.
3. Candidates are awarded marks for all reasonable answers including different but still reasonable numerical solutions.
4. Candidates' answers are made up of a series of points. For example, a point can be stating a valid type of risk and then another point for describing the type of risk, if so asked. The available marks give a general guide to the level of detail students' answers are expected to cover.
5. Where a question sets out a specific scenario, candidates are expected to tailor their solutions to the circumstances described. Offering a more general ("standardised") solution in a case like that would score fewer marks.

B. General comments on *student performance in this diet of the examination*

1. The paper covered a fairly normal range of topics, including capital projects, market environment, mergers and acquisitions and financial risk management.
2. While the paper did contain some more difficult sub-questions, overall students performed better on this paper than previously.
3. The paper has less evidence of students giving generic answers which ignore the scenario set in the question (and typically score lower marks). It is probable that the sub-questions addressed quite detailed aspects, which limited the scope for general answers.
4. Some students missed out on marks by presenting solutions in unreadable handwriting.
5. This paper had no calculation sections however marks would be awarded for workings in the case of numerical answers.

C. Pass Mark

The Pass Mark for this exam was 57.

Solutions

Q1

- (i) Project finance is *debt* supported by a project and not by the project's sponsoring companies [1]

Typically, the debt is supported not just by the project's assets but also by a variety of contracts and guarantees provided by customers, suppliers and local governments (as well as by the project's owners) [1]

Common features of project finance include:

- The project is established by a separate company set up for the purpose
- The contractors who will develop the project, and the company that will operate it, become major shareholders in the project (and thus share in the risk of the project's failure).
- The project company enters into a series of contracts that distribute risk among the contractors, the operator, the suppliers and the customers
- These contracts ensure that each risk is borne by the party that is best able to measure and control it.
- Where appropriate, national or local government may be required to provide guarantees in respect of statutory restrictions or adverse market conditions.
- The detailed contractual arrangements and government guarantees allow a large part of the capital for the project to be provided in the form of bank debt or other privately placed borrowing.
- ... however a government or similar guarantee is not itself a distinguishing (or indeed necessary) feature of project finance
- The term of the project finance would be set so as not to exceed the duration of the project itself
- The senior debt may be provided by groups of major international banks, but government and international funds and agencies will often provide junior debt.

[½ mark each bullet unless stated]

[Max 4]

This was bookwork and answers were expected to be close to the Core Reading. Students were expected to say more than "Project finance is finance raised for a project"!

(ii)

- Construction is not completed
- Completion of construction (and therefore use of stadium) is delayed
- Poor quality of construction
- Cost overruns
- Design error (including realising areas of unsuitability for intended purpose)
- Design changes part-way through construction
- Contractor failure
- Fraud by contractor
- Catastrophe risk / physical risk to stadium
- Political / legal challenge to the stadium build
- Foreign exchange risk for any materials or services purchased from overseas contractors/suppliers
- Injury/death of construction workers
- Injury/death of anyone else on/near to the site
- Environmental damage, pollution, improper waste disposal
- Damage to neighbouring land/properties caused by construction activity

[½ mark each bullet]

[Max 3]

This was a "creative" question expecting students to think about a range of possible issues.

Additional valid points not listed above would have scored marks.

Most students achieved high marks.

(iii)

- Ensure that build contracts have a guaranteed maximum price
- Ensure that build contracts have a guaranteed completion date.
- Ensure that build specifications are clear and thorough...
- ... and have been checked by experts including for technical accuracy and compliance with local building codes.
- Ensure that there are periodic inspections of build quality...
- ... and break/compensation clauses in build contracts if these are failed.
- Contingency reserves outside of construction contracts can be established,
- E.g. as a certain percentage of the total construction costs.
- Have margins in the implementation timetable, e.g. schedule the first use of the stadium a few months after the expected completion date.
- Penalise the contractor for delays.
- Select well known contractors / gain references / perform careful due diligence.
- A contractor can obtain a letter of credit for the issuer's benefit to overcome some concerns.
- Take out an insurance policy to cover costs of errors / issues
- E.g. employer / public / professional / pollution liability
- E.g. catastrophe insurance (flooding, earthquakes etc.)
- Ensure that health & safety mechanisms are put in place and followed.

- Have robust disaster planning.
- Put robust overall project management in place.
- Ensure that possible objections are dealt with before build commences.
- Have a legal team in place to defend against any regulatory or local challenges
- Plan for appropriate environmental impact, cleanup, waste disposal etc.
- Subcontract areas of risk to specialists
- Engage with local community or regional leadership/government
- Any foreign exchange risk could be managed/mitigated using currency forwards
- Put stadium project into a separate company, legally remote from the club

[½ mark each bullet]

[Max 6]

A follow-on question to (ii) expecting students to think more deeply about their suggestions.

As above additional valid points not listed above would have scored marks.
Students performed comparatively poorly compared to their answers in (ii).

- (iv) The holding company has two largely independent sources of revenue (dividends/profit share from Club plus dividend/profit share from stadium) from which it could meet its debt obligations [1]

The Stadium Company would be set up as a special purpose entity ... [½]

... which is bankruptcy remote, i.e. it will not be consolidated with the club or the holding company in the event of bankruptcy. [½]

Having separated cashflows will make it easier to assess and monitor the different cashflows more easily. [½]

This structure means that separate contracts can be entered into with each entity... [½]

... and any revenues that go to the Stadium Company are “trapped” and cannot be used by the Club without explicit inter-company agreements or contracts. [½]

If HoldingCo goes bankrupt, investors would have a claim on all of HoldingCo's assets which includes shares in Club as well as shares in StadiumCo [½]

Note that HoldingCo debtholders may or may not have a claim on the stadium itself – this is a matter of contracting – HoldingCo does not own the stadium, it owns shares in StadiumCo and unless the stadium has been explicitly pledged as collateral to HoldingCo., any other debtors of StadiumCo would have first claim on this asset..

The delineation of revenues between the entities means that the issuer will likely get a higher credit rating. [1]

StadiumCo will have no operating history on which to base a credit rating *however* Club probably does and HoldingCo may - i.e. the proposed structure gives several reference points for establishing a credit rating which StadiumCo on its own would not be able to provide [½]

HoldingCo may have an existing debt issuance programme which would make new issues easier. [½]

The separation of entities and individual contracts mean that each of the entities will try to ensure that the revenues tied to them are high enough to meet the debt covenants. [½]

The revenues linked to the Stadium Company are likely to be contractually obligated... [½]

... which protects against the potential volatility in the club revenue which is associated with the club performance. [½]

Similarly Club could continue to operate even if StadiumCo fails [½]

The structure simplifies the negotiation of various contracts... [½]

... such as those of naming rights, media rights etc. [½]

Since the Stadium Company is a separate special purpose entity, it may have Independent Directors who must agree with bankruptcy filing. This means that if the club declares bankruptcy, it is not guaranteed that the Stadium Company will also agree to be declared bankrupt [½]

[Max 4]

Students performed poorly on this question.

Those who did well recognised that the holding company (the debt issuer) had two streams of income to rely on, and two separate assets (shares in the club and in the stadium) for meeting debt payments which would enhance credit quality.

(v) Additional risks include the following:

- Anticipated increase in demand for season tickets does not materialise or is lower than expected.
- Anticipated increase in sponsorship and media revenues does not materialise or is lower than expected.
- Poor team performance which impacts sponsorship and ticket sales
- Financial mismanagement at Club – e.g. overspending on player salaries
- Concentration risk: revenues may be too dependent on match-days
- General volatility of stadium revenues
- Risk that revenues outside of match-days / the football season will be insufficient because of an inability to host other events.
- If revenues are split contractually between the stadium and the other entities, this could in theory cause liquidity issues if the cash is not available in the correct legal entity where it is needed
- If naming rights expire and these take too long to renegotiate, there may be a period where the Stadium Company struggles to pay their contractual obligations.
- Possible liquidity issues from early-years interest payments before stadium operational and earning revenue

- Fall in land values where stadium has been built reduces NAV of StadiumCo and/or value of shares held in StadiumCo.
- Revenue interruption due to stadium damage / terrorism / catastrophe
- Inability to find sufficient investors / insufficient market demand...
- ... at an acceptable price
- Cost of placing the funding in the market is greater than expected
- If the debt is fixed coupon debt it may lock in an unattractive interest rate
- Debt holders may not have direct recourse to the assets of the subsidiaries (StadiumCo and Club) and may demand higher coupons to compensate

[½ mark each bullet]

[Max 4]

An unexpectedly difficult question that required some lateral thinking about financial issues that could adversely impact on the ability to repay the loan. Most students scored a handful of marks but few excelled.

(vi) These risks could be mitigated in the following ways:

- Insurance to cover catastrophe risk, terrorism, business interruption and property risk.
- A separate reserve fund could be setup which can cover periods where the revenue stream is insufficient to meet the contractual obligations.
- The design of the stadium could be such that it includes restaurants and apartments which can generate revenues outside of match-days.
- The design of the stadium could be such that it will be easy to hosts other events such as concerts or other sporting events.
- Further feasibility studies carried out by a wider range of 3rd parties could be looked at before determining the expected level of demand for season tickets etc.
- The results of the feasibility study could be validated using other information such as historic attendance...
- ... and analysis of market demand by using surveys / focus groups.
- Contractual debt service coverages or other covenants could be put in place.
- Make debt more attractive to purchasers.
- Improved marketing of the debt.
- Secure bank overdraft facility to cover initial liquidity strain
- Agree long-term sponsorships/media deals now or offer multi-year season-ticket incentives to generate predictable revenue early on
- Include a callable feature in the debt (in the event that the company believes current interest rates may fall)
- Issue floating rate debt (including potential innovative coupon links like interest being a function of match revenue or the Club's sporting success)
- Try to secure lower borrowing costs
- ... e.g. offer additional security interest (like shares in Club)
- ... e.g. arrange 3rd party guarantees (perhaps from local government or a sports association)

- Have a planned coupon payment holiday early on

[½ mark each bullet]

[Max 3]

A follow-on from (v) which was similarly poorly answered by most students.

Q2 (i)

- trading volumes act as a proxy for market size and depth
- therefore if observed trading volumes are reduced, this may indicate the underlying market is becoming less efficient [1]
- so companies will be less likely to be able to raise more funds...
- ... quickly...
- ... and at a fair price
- ... in the required size
- Reduced volumes are likely to result in higher price volatility which issuers may find unattractive (i.e. may wish to avoid their debt securities subject to high secondary market price volatility)
- Reduced volumes may be an indication there are fewer buyers of debt (buyers being most relevant from the perspective of a new issuer)
- the reduced volumes may therefore reduce the attractiveness of seeking to list new securities in this market [1]
- companies may therefore prefer to list securities elsewhere (i.e. on other exchanges or non-UK markets)

[½ mark per point unless stated]

[Max 4]

Most students scored some marks for this.

The question was specific to the relationship between debt trading and debt issuance. No marks were awarded where students ventured off topic into equity issuance for example.

(ii) Environmental factors

- UK may have better infrastructure for issuing the debt (notwithstanding the reduced trading volumes)
- ... including established and experienced brokers
- ... and better access to potential investors/buyers of the debt
- Trading volumes may have fallen everywhere, making the UK no more or less attractive *relatively* than it was before
- UK governance regime or listing rules may be easier to comply with than elsewhere
- company may be more familiar with the listing process in the UK ...
- ... hence lower internal cost of dealing with the issue
- local presence of rating agencies may enable quicker/cheaper rating for any bonds to be issued

- financial information needed by debt investors may be easier to produce in the UK
- stable UK political, legal and financial environment gives predictability to companies
- current low level of UK interest rates may be attractive (although many other major markets also have low levels of interest rates at the moment so there may be limited advantage)

Factors specific to the company

- for companies based in the UK, local market brings easier access to advisers and bankers
- company may have existing debt listed there already, to which it can add new or similar tranches...
- ...thereby simplifying the listing process (e.g. ratings, legal documents)

Factors specific to the debt

- currency: the UK debt market likely to be the primary place for issuing GBP-denominated debt
- comparable debt may exist already, enabling easier pricing
- bonds may be marketed on a hold-to-maturity basis so liquidity not as important...
- ...e.g. unusual infrastructure or real estate debt
- trading volumes may not have fallen for this particular type of debt
- debt may include terms of particular interest to UK investors (e.g. linkage to a UK index or favourable UK tax treatment)

[½ mark per point]

[Max 6]

The question included some pointers about the topics students should consider although not all appeared to have noted this and concentrated their answers on a narrow range of issues.

The question was not concerned with what the proceeds of the debt issue would be used for – and hence comments about the attractiveness or otherwise of the UK as a place to invest or start new projects were not relevant.

(iii)

- debt capital markets effectively set the price of new debt
- thereby markets “specify” the required return for new projects...
- ... especially (in this case) those funded by new debt
- a volatile market means that price discovery is more uncertain / less reliable...
- ... and results in constantly changing required returns
- ,, and probably a higher overall interest rate due to a higher risk premium demanded by investors
- the uncertainty created thereby may discourage companies from proceeding with projects

- ... until there is a more stable environment
- ... especially for long-term projects...
- ... or projects with a long lead time
- ... for example because the company may be unable to raise project finance on terms as planned at start of project due to large market movement in the meantime
- capital market movements may also have adverse implications for (or increase the volatility of) the company's normal revenue cashflows...
- ... e.g. increased cost of servicing debt raised for other purposes (if on variable terms)
- companies may not wish to undertake a new project in those conditions as it may not feel confident that it will be able to support the project revenue and/or fund the servicing costs for any project finance raised
- or it may feel that it needs to keep management focus on the core business rather than start new projects
- the value of retained earnings or invested reserve capital set aside for a project may have fallen as a result of the movements, so that the project is no longer affordable using those reserves

[½ mark per point]

[Max 5]

Another poorly answered question. The idea that debt capital markets effectively set the price of new loans should be familiar, and that volatility in loan pricing is therefore likely to cause uncertainty (deferral or cancellation) of projects.

(iv)

- dark pool transactions are not transparent since they take place without publication of prices/volumes or any compliance with disclosure rules
- indeed they explicitly promote and value anonymity of the transaction and counterparties
- ... whereas transparency is a key principle of UK government macro framework...
- it is also not clear that dark pools are compatible with the accountability and responsibility principles [1]
- dark pools provide no investor protection...
- trading in dark pools takes place without any oversight by the FCA (or any other regulator) [1]
- hence there is opportunity for investors or issuers to be adversely selected against (e.g. through front-running)...
- ... which is contrary to fair trading principles
- dark pools may allow investors to (temporarily at least) circumvent restrictions like takeover rules

- dark pools do however increase competition for trades which may result in keener pricing on public markets (public market traders may respond to the dark pool by making their quotes more attractive / smaller bid-offer spreads / etc. as a way to regain lost trading business)
- but overall, they are not compatible

[½ mark per point unless stated]

[Max 4]

A lateral question which was well answered.

Most students recognised that a lack of oversight and transparency could be harmful to investors and contrary to stated government objectives.

(v)

- promote competition among market participants
 - e.g. encourage more debt brokers to set up
 - e.g. by using tax incentives...
 - ... both leading to reduction in brokerage or similar costs
 - ... which in turn encourages execution
- widen field of market participants
 - e.g. encourage the development of non-traditional players in the debt capital markets...
 - ... such as shadow banks...
 - ... or retail investors
 - ... or foreign investors (perhaps where a restriction existed before),,
 - ... or the government itself (as an investor/issuer or as a broker)
 - e.g. allow foreign brokers to access market more easily
 - ... leading to greater depth of orders
- reduce (external) transaction costs
 - e.g. reduce stamp duties or other frictional levies
 - ... encouraging trading itself as portfolios can be rebalanced more easily
- improve regulatory capital treatment of bonds in hands of e.g. banks
 - e.g. require bank to hold less capital against portfolio of bonds
 - ... encouraging more buyers
- encourage new listings of bonds
 - e.g. simplify listing requirements or subsidise the cost
 - e.g. standardise listing requirements
 - e.g. make tax treatment more favourable to issuer
 - ... all leading to greater supply / greater market cap of securities
- reduce financial disincentives for dealers or investors
 - e.g. reduce regulatory compliance or corporate structure burden (like forced separation of corporate functions) on dealers or issuers
 - ... leading to greater number of market participants
 - e.g. abolish (capital gains) tax for individuals on bonds
 - ... leading to greater demand for securities
 - ... or less hindrance to rebalancing portfolios

force alternative marketplaces to publish trading information, e.g. publish volume traded...

... and prices achieved

... leading to greater transparency of non-traditional execution

[1 mark per point]

[Max 6]

A creative follow-on question to (iv) with a large number of potential solutions (and others not listed above additionally possible).

Marks were similar to (iv).

Q3 (i)

- Valuation based on accounting multiples: construct a valuation range based on the multiples that comparable listed companies are trading at
- Valuation based on accounting multiples: construct a range based on what multiples buyers paid in the past for control of similar businesses
Discounted cashflow: present value of the future cash flows it expects the firm to generate (including the impact of integration costs and synergies)
- Dividend discount model (DDM): projecting forward future dividend payouts and discounting to obtain a present value.
- Leverage buyout value: how much would a private equity firm pay if they want to achieve a minimum level of returns.
- Break-up value: the “sum-of-the-parts value” from analysing each business segment separately.
- Start with the firm’s current market capitalisation to get a market value and add a premium reflecting the likely cost for gaining control.
- Accounting value or book value i.e. from the balance sheet, adding the capital invested in the business plus retained profits built up over time.

[1 for each bullet point]

[Max 4]

A relatively straightforward question, with most students scoring reasonable marks.

(ii) Typically ranking highest to lowest would be:

- DCF with synergies (this will include expected benefits of the transaction and hence probably be the highest) Accounting multiples transaction comparables (this will include average expected benefits from other, similar transactions which may understate the full benefits of this transaction)
- DCF / DDM, accounting multiples trading comparables (similar to the one before, but now looking at current market comparables rather than specifically estimating the full benefits of this transaction and ignoring any control premium payable)

- Break-up value or “sum-of-the-parts value” (this will ignore any synergies resulting from the transaction, but may value some assets above book value if there is a ready market for them)
- Book value (depending on age of business etc.) (this will also ignore any synergies resulting from the transaction and be based on the lesser of historic and market values)
- LBO (this will deliberately try to understate the value of the company such that the purchase price is lower and hence the amount of debt taken on in an LBO is lower)

Current market capitalisation could be anywhere but likely to be above the LBO value

Note: these rankings are not formulaic and a sensibly-reasoned alternative highest or lowest result is fine and would score equivalent marks

[½ for sensible choice of highest, ½ for sensible reason for it, ½ for sensible choice of lowest, ½ for sensible reason for it]

[Max 2]

A follow-on to (i) expecting students to rank their answers in (i).

Students who understood the "motive" for the valuation – e.g. an LBO typically seeks to undervalue the company as much as possible, to reduce its purchase cost – had an advantage over others.

- (iii) A leveraged buyout (LBO) is a transaction where a company is purchased with a combination of equity and significant amounts of debt. [1]

It is structured in such a way that the target's cash flows or assets are used as the collateral to secure and repay the debt. [½]

Since the debt has a lower cost of capital than the equity, the returns on the equity increase as the amount of borrowed money does until the optimal capital structure is reached. As a result, the debt effectively serves as a lever to increase returns on investment. [1]

“Strip” financing is often used, i.e. the debt is held in approximately equal proportions to the equity. [½]

Securities commonly subject to strip practices are often called “mezzanine” financing, and include securities with priority superior to ordinary shares yet subordinate to senior debt.

Strip financing, and the allocation of equity in the deal, helps to limit conflicts of interest and bankruptcy costs. [½]

LBOs can have many different forms such as a management buyout (MBO). [½]

LBO typically relies on one or more (syndicate) banks providing debt financing

[½]

The LBO acquiror typically expects to exit the company by selling the shares at a profit over a relatively short timeframe (say 5 years)

[½]

[Max 3]

Students who understood that an LBO is a debt-heavy acquisition where the debt is supposed to be repaid using the target's cash flows had an advantage in their answers.

Most students scored reasonable marks with well-prepared candidates getting near full marks.

- (iv) Given the high levels of leverage, there is likely to be significant value from the tax shield on interest payments

Shareholder value is likely to rise as the debt is repaid with operational cashflow

Operational or other improvements leading to margin expansion and thus a higher enterprise value; given the high levels of debt there will be pressure to extract these as far as possible.

[1 mark per description]

[Max 2]

Most students scored reasonable marks with well-prepared candidates getting near full marks.

- (v) Cheap i.e. low valuation or attractive purchase price (helps to generate high returns)

Potential for improvement (ability to add value from making operating or other improvements to increase value)

Good management (a highly geared company does not have much margin for error in how it is operated)

Stable (or growing) business history (LBOs have high interest payments which require stable (or growing) cash flows to service, and ideally not too sensitive to the economic environment)

Firms with substantial free cashflow (in order to service the debt)

Good visibility on future cashflows / long term contractual nature of cashflows (e.g. ideally long term contracts in place with customers)

Quality (tangible) assets that could be used as collateral for debt

Low capital expenditure / research & development requirements (as most cash will get used to service debts, ideally the target firm should not require high or increasing levels of capex or R&D)

Future catalysts for exit (opportunity to exit the firm after say 3–5 years)

Relatively low fixed costs (fixed costs create substantial risk for Private Equity firms because companies still have to pay them even if their revenues decline)

Relatively limited existing debt (the LBO works because the private equity firm adds more debt to a company's capital structure, and then the company repays it over time, resulting in a lower effective purchase price; which may not be possible if the company has a large amount of existing debt)

Note that being profitable is arguably less important - cash flow is what matters. A company which is profitable on paper but generates small cash flows is an unattractive LBO candidate.

[½ mark each (note it is **not** necessary to include the bracketed explanation for each to gain the half mark)]

[Max 4]

This question was relatively poorly answered.

Students who recognised that a good target company is one that can bear the heavy debt load (because of strong cashflows, or undervalued assets) had an advantage.

(vi) (a)

The trade-off theory of capital structure balances the added value provided by tax savings against the additional costs generated by financial distress in order to maximise shareholder value.

The optimal capital structure will vary from firm to firm. Companies holding plenty of safe, real assets and generating plenty of taxable profits should have high gearing ratios, while unprofitable companies (or those with risky, intangible assets) should rely primarily on equity financing. Earnings volatility will be a key issue to consider.

Frictional costs of adjusting capital structure will then mean that individual firms may not have their “optimal” structure in place at all times. Thus we may find that companies operating in the same industry, and subject to the same influences, but with differing financial structures at any given time.

Borrowing is often preferred to equity issuance as it is cheaper, easier and quicker to get, relatively passive and term-flexible.
Equity is considered to be more permanent and will be raised when it is considered to be cheap (relative to debt) or when debt is unavailable or would create inappropriate leverage.

Note that the trade-off theory does not concern the weighted average cost of capital – it addresses the trade-off between tax savings and financial distress.
[1 per point]

(b)

As financial sponsors of the LBO increase their returns by employing very high leverage, they have an incentive to employ as much debt as possible to finance an LBO acquisition. [1]

According to the trade-off theory, this will generate excessive tax savings but introduce significant risk of financial distress [1]

In practice this has led to many situations, in which companies were “over-leveraged”...
... meaning that they did not generate sufficient cash flows to service their debt...
... which in turn led to insolvency...
... or to debt-to-equity swaps in which the equity owners lose control over the business and the debt providers assume the equity.
... and where any expected tax savings never materialised.
[½ per point unless stated]
[Max 5]

Answers were satisfactory for this question.

Many students appeared to have a vague recollection of the trade-off theory (which is strictly trading off the tax savings on debt against the risk of bankruptcy) and presented answers about more general capital structure optimisation; these students scored fewer marks.

(vii) Asymmetric information is the term used to indicate that some stakeholders in an enterprise will know more about the business than others. [½]

In particular, managers typically know more than outside investors. [½]

Such asymmetry influences financial choices. [½]

And leads to a pecking order theory of finance:

- internal finance and retained earnings
- debt issues
- equity [1]

Thus, profitable firms borrow less since they do not need recourse to external funding. Since the funds used could otherwise have been paid out to shareholders, the internal financing choice reduces gearing. [1]

Next, borrowing is used thereby increasing gearing. The motive is either to avoid the costs of issuing equity or to avoid having to issue new stock at a deep discount to existing share prices (thereby diluting the position of existing shareholders). The latter may be particularly concerning when finance for a new venture is being considered, since equity investors will be uncertain about the potential return on the venture. [1]

Finally, equity is issued when levels of gearing are felt to be too high and the costs of additional borrowing are consequently too great. Also, covenants on existing debt may be in danger of being breached. [1]

A corollary of the pecking order theory is that financial slack has a value. Ready access to liquid funds and borrowing facilities aids raising new finance, when needed. However, it may enterprises retaining unneeded funds which would better have been returned to shareholders. [1]
[Max 4]

Answers were satisfactory for this question.

Most students understood that insiders would have better information about the company and that the existing capital structure would influence the choice of subsequent capital raising.

- (viii) LBOs typically pay off existing debt and usually replace this with much larger levels of external borrowing, but typically do not look to raise additional equity (unless through warrants from mezzanine finance etc.). There is typically less appetite for financial slack in an LBO. [1]

To align stakeholders like company management who know more about the business than outside investors, it would make sense to have their equity stake roll into an equity stake in the new LBO capital structure. [1]

Information asymmetry means that external stakeholders need to do a lot of due diligence on a company and its characteristics before deciding to engage in an LBO, given that internal stakeholders with superior knowledge of the company may have conflicting motives. [1]
[Max 2]

Answers were poor, with numerous students scoring zero.

Q4

- (i)
- A risk review takes place at key stages through the life of a project [½]
 - It involves systematically identifying risks, entering them in a risk register and evaluating them to determine their likelihood, impact and any relationships between them. [1]
 - Where appropriate, mitigation measures are identified to avoid, reduce or transfer risk – these measures are incorporated into a risk mitigation strategy. [½]
 - For those risks which remain, an investment model is used to estimate to overall riskiness and viability of the project. [½]
 - Assuming the project is not aborted, a risk response plan is then agreed. [½]
 - A risk process manager and risk review team is likely to be established. [½]
- [Max 3]

The question was addressing a specific sub-part of the project process.
Marks were generally high.

- (ii)
- Policy data is not copied across correctly to the new system or some other system integration failure
 - Some policy data is not copied across (e.g. freeform notes on a policy record)
 - The new administration system does not provide the outputs required for downstream processes (e.g. management information, accounting systems, actuarial systems).
 - Links between records are not carried across to the new system (e.g. claim records with the core policy record, linked policies with the same policyholder are disaggregated).
 - Staff are inadequately trained on the new system.
 - Service standards are not able to be met by the new system.
 - Failure of the outsourcer
 - Costs of undertaking the data transfer exceed expectations
 - Time taken to perform the data transfer is much longer than expected thus delaying the start of the agreement.
 - Key administrative staff are not happy about the transfer and leave, thus losing valuable expertise
 - Poor morale and thus performance amongst remaining staff, who may believe that their roles are also at risk of being outsourced.
 - Confidential data may be leaked during the transfer

[½ mark per point]
[Max 3]

The question had a large range of possible answers.

Marks were very high for this question – even students who struggled elsewhere scored highly here.

(iii)

- Example of a scoring system might be to rate each of the likelihood / frequency and impact/severity of a risk from 1–4 with 1 being the highest. Marks for any other sensible system (e.g. red, amber, green). [1]
 - Scores could be multiplied together to give an overall rating. [½]
 - Scores may be shown pre and post-mitigants [½]
 - Target scores may also be given to reflect the fact that some risks cannot be completely eliminated. [½]
- [Max 2]

Most students understood that a simple scoring system using a ranking would most likely be used. Few students extended this into how risk mitigants might affect the rank/score.

(iv) Other columns expected in a risk register would be:

- A numeric identifier for the risk
 - A description of the nature of the risk / its causes
 - High level classification of the risk e.g. operational
 - Relationships with other risks
 - Timeframe for the emergence of the risk e.g. short/medium/long term
 - Which company divisions are affected by the risk
 - The date that the risk was raised
 - The person responsible for managing the risk
 - The risk mitigants proposed to reduce the risk
 - The expected date by which the mitigants will be in place
 - The status of the activity
 - The date that the activity was completed
 - Date of next review of data (equivalently date of expiry of data)
- [½ mark per point]
[Max 3]

Most students were able to list several additional columns.

(v)

- AMA framework must include internal loss data, external data, scenario analysis and analysis of business environment and internal control factors [1]
- The first step is to derive a distribution separately for frequency and severity for each of the operational risks. [1]
- This should be done, as far as possible, by fitting to observed losses ... [½]
- ...although in this case the insurer is unlikely to have much data to use. [½]
- The combined frequency/severity distribution can be derived using mathematical techniques or through a simulation approach. This should define the loss distribution for the risk. [½]
- Each of the separate risks then needs to be combined together with the aim of deriving an aggregate loss distribution. [½]
- To do this a copula will need to be used to aggregate the risks. [½]

- The aggregate distribution would be found through Monte Carlo simulation. [½]
 - A result is then taken at the required confidence level. [½]
 - Alternatively, the aggregate capital can be assessed at a particular level of probability and combined using a correlation matrix that defines the inter-relationships between each risk at a particular level of probability. [½]
- [Max 3]

Students who couldn't recall what the AMA means were at a disadvantage.

Note that Value-at-Risk is not applicable here – VaR deals with market risk not operational risk.

Marks were polarised.

(vi)

- Operational risk is added after other risks have been considered in the capital requirements calculation. [1]
- The operational risk model amendments need to include both the reduction in the risks already allowed for ... [1]
- ... due to passing control for these operational risks to the outsourcer... [1]
- ... plus the creation of the new risks... [1]
- ... that arise from entering into the outsourcing relationship. [1]
- The first step will be to identify the material additional risks. The risk register can be used as a source of this information. [1]
- The risk register is likely to lack certain information required for the modelling of the risk so more information will need to be obtained on these aspects. [1]
- In particular:
 - The risk register is not necessarily calibrated to any particular level of loss. [1]
 - The risk register only typically contains one point for the likelihood and one point for the severity. This is insufficient to parameterise most distributions. [1]
- The impact of risk reduction through the transfer of risk in the outsource agreement is unlikely to be reflected in the risk register as it usually only deals with potential sources of increased risk. [1]
- The current operational risk calculation will therefore need to be decomposed back to the underlying risks... [1]
- ... and, where risks have been fully or partially transferred, the exposure will need to be adjusted. [1]
- The impacts of the altered risks will then need to be assessed, in terms of at least the expected impact and the variance/standard deviation of that impact (i.e. two moments)... [1]
- ... in order for the probability distributions to be parameterised. [1]
- Parameters should be set, where possible, using historic observations/data. [1]
- Industry data may be used if internal data is not available or sufficiently credible... [1]
- ... however this may not be directly relevant to this company. [1]
- For risks where no relevant data exists, there will be a need to involve experts within the business to carry out the assessment. [1]

- This is typically done via workshops with the group of relevant people to derive the estimates. [1]
 - Depending on the timeframe of the capital projection, trends may need to be allowed for. [1]
 - Once the estimates are available a distribution needs to be chosen that is appropriate for the risk. [1]
 - In particular the behaviour of the distribution in the tail will be important for assessing capital if the loss level at which it is assessed is extreme. [1]
 - The new risks will then need to be correlated against each other and the pre-existing risks in order to determine the level of dependence. [1]
 - Correlation factors or dependency coefficients therefore also need to be estimated for the new and adjusted risks. [1]
 - The aggregate operational risk capital can then be computed pre and post-diversification. [1]
 - It is often useful to compare the diversification benefit achieved as an overall check that the dependency of risks has moved appropriately. [1]
 - It should be noted that the high reliance on expert judgement in the work gives a potentially high volatility in the resulting capital requirements. [1]
 - It will be important therefore to understand:
 - The key risks to which the calculation is sensitive [1]
 - The sensitivity of the calculation to the distributions chosen [1]
 - The key correlations between risks which affect the overall total risk. [1]
- [Max 9]

A difficult question which was generously loaded with available marks.

Most students understood there was a reduction in risk by transferring to an outsourcer which is then offset by an increase in risk due to possible failure of the outsourcer (failure to deliver agreed work or by going out of business).

Few students explored how the revised risk profile might be "mathematically" assessed.

(vii)

- In order to calculate the return on risk-based capital, the change in capital required will need to be computed at the appropriate level of probability consistent with the company's economic risk appetite. [1½]
- This should include all of the risks that are affected by the transaction, including the operational risk capital. [1½]
- An economic profit measure will need to be defined where profit is adjusted to allow for the risk taken ... [1½]
- ...by, for example, allowing for the cost of the risk capital employed in generating that return. [1½]
- In this case with an operational outsourcing project "profit" will be in the form of cost reduction rather than revenue generation. [1½]
- If not directly available, a suitable proxy may be employed. [1½]
- The return is then the ratio of the additional economic profit generated by the project to the additional risk-based capital required for it. [1½]

- i.e. $RAPM = (\text{Revenues} - \text{costs} - \text{"expected" losses}) / \text{Risk-adjusted capital}$ [½]
 - Note that the return could be considered on a marginal basis as well as on the change in the total return. [½]
- [Max 2]

Most students offered the "RAPM" formula but few explored what profit or the risk capital would be before vs after the outsourcing.

END OF EXAMINERS' REPORT