

# INSTITUTE AND FACULTY OF ACTUARIES

## EXAMINERS' REPORT

April 2016

### **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.

F Layton  
Chair of the Board of Examiners  
July 2016

**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. Candidates are awarded marks for all reasonable answers including different but still reasonable numerical solutions. This paper had no calculation sections however marks would be awarded for workings in the case of numerical answers.
3. Candidates' answers are made up of a series of points. For example, a point can be stating a valid type of risk, describing the type of risk or (part of) a calculation.

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

1. The SA subjects are the last subjects in the sequence of formal actuarial exams. Candidates taking SA5 are expected to have at least a basic knowledge of how businesses such as banks, pension funds, insurance companies and the securities markets function.
2. Most candidates attempted answers to every question. Question 3 parts (v), (vii) and (viii) were considered difficult by many candidates and answers here were occasionally sparse. A small number of students were able to understand and respond well to all questions and scored good marks as a result.
3. As ever, candidates will benefit from practice with past papers and reading the financial press. The resulting improved depth of understanding of the application of finance in practical situations will make some questions much easier to answer.
4. Candidates are also once again reminded to read the questions *carefully* and frame their answers *to the situation described* or to the specific instruction given, rather than offer generic answers. Particularly where the context seeks to test a specific piece of understanding, generic answers may score few marks. For example, question 1 concerned a vehicle manufacturing company; generic answers related to insurance companies would not score as well as tailored answers recognising this particular company's circumstances.
5. Question 1 concerned an application of risk capital principles to a non-traditional insurance situation (a manufacturing company offering insurance-type add-on services), as well as a capital structure section about leverage and shareholder responses.
6. Question 2 was about callable bonds including a minor section on how individuals could use them. The remainder of the question was fairly typical SA5 regarding funding

alternatives available to the company and issues faced by investors in the relevant bonds.

7. Question 3 was a combination of a "standard" merger situation – with fairly typical subquestions – with a merger arbitrage section which many students found difficult.
8. The comments that follow the questions concentrate on areas where candidates could have improved their performance in individual questions.

**C. Comparative Pass Rates for the past 3 years for this diet of examination**

<i>Year</i>	<i>%</i>
April 2016	45
September 2015	46
April 2015	35
September 2014	32
April 2014	46
September 2013	44

**Reasons for any significant change in Pass Rates in current diet to those in the past:**

The Pass Rate is virtually identical to the previous diet.

**D. Pass Mark**

The Pass Mark for this exam was 56%.

## Solutions

- Q1** (i) Pre-loss financing = secured by arrangements made and costs borne in anticipation of loss; the financing burden (the premium payment / capital raised ) is incurred before the loss.

Post-loss financing = by the securement of funds after the loss  
The financing arrangements are responsive to the loss, rather than anticipatory and costs / terms of raising finance borne after the loss

Well answered by most students. Students were expected to not simply restate the terminology – so for example "obtaining finance before the loss" was insufficient to define pre-loss financing; the *anticipation* or a sense of forecasting were key.

- (ii) Any three sensible suggestions, including:
- take out an insurance policy of some kind
  - secure a line of credit from a bank
  - issue debt on the capital markets
  - raise equity capital
  - securitise some assets (e.g. a factory) and retain any cash received as a reserve
  - obtain a 3<sup>rd</sup> party guarantee (perhaps from a parent company if it exists)
  - set aside an internal reserve, e.g. from retained profits

Again, well answered by most students.

- (iii) Risk-based capital is capital held by entity which seeks to reflect the risk posed by its activities.

A more volatile portfolio (i.e. one that has the potential to generate larger losses) will require more capital.

The “risk” considered would typically be the risk of failing to achieve key business objectives...

... whether through becoming insolvent...

... or failing to meet a target rate of return.

*[Note: the answer should address risk-based capital and not simply capital in general]*

This was essentially bookwork but answers were mixed.

(iv) Strengths:

- sound theoretical principle, placing capital where it is most likely to be needed
- requires entities to quantify risk
- requires entities to recognise the capital cost of writing business
- allows comparison of potential profit with the risk of losses
- aligns with the company's objectives through the choice of appropriate risk measures / promotes good risk management
- consistent with the principle of charging a greater price for accepting risks which have a greater destabilising impact on the company
- can recognise the potential cost of risk in measuring the performance of different business units
- provides insight into the chance of failure for a given amount of capital
- for some types of company (e.g. insurance), it is consistent with the regulatory regime

Weaknesses:

- the risk component is uncertain, so it is rarely possible to verify that correct results have been calculated
- capital calculations can only be as accurate as the risk assessment and model / data they are built on
- particularly with regard to assessing the degree of dependency between individual components of risk and then assessing the aggregation of risks
- a great deal of judgement is exercised in carrying out a risk assessment and the results may reflect subjective views
- the results can be subject to influence

- particularly demanding implementation for a type of company (such as this one) which is not required to do so for regulatory purposes

This was also essentially bookwork and with many marks available, answers were generally good.

- (v) Tier 1 = share capital (as reflected in the company's books, not the market value), retained profits, disclosed reserves  
Could be used to meet “normal” (expected) warranty claims

Tier 2 = any medium or long term subordinated debt, hidden reserves (*note: not likely to include unrealised investment gains*)  
Could be used to meet “unusual” (unexpected) warranty claims, e.g. product recalls

Tier 3 = any short term, unsecured debt  
Could be used to meet “catastrophe” (extreme) warranty experience, e.g. customer injuries from malfunctions when using the cars and possible related punitive / liability damages

An application question testing understanding of the capital tiering concept. Students found this more difficult, especially relating it to the company in question. The answer should also make some attempt to relate the “tiering” of warranty claims by frequency or severity to the matching type of capital.

- (vi)
- Company will want to assess the required level of capital to withstand possible losses from warranty claims...
  - ... over a specified time interval...
  - ... with a pre-determined confidence level.
  - Capital required would be determined based on possible losses arising from "normal", "unusual" and "extreme" events (at the given level of confidence and time horizon).
  - For example 99.5% confidence over five years. *[or any sensible example]*
  - Level of capital will reflect business owners' desired return on equity because more capital ringfenced may mean reduced ability to generate profits elsewhere (noting this is not an insurance company and not subject to a minimum capital requirement in the same way).
  - Company will need to assess both the likelihood and severity of possible warranty claims.

- Ideally a probability distribution would be used for each of these measures.
- Confidence level chosen depends on risk tolerance (risk appetite) of business owners
- ... who would otherwise need to inject more capital if warranty claims become excessive
- Company could make use of guidance provided under the regulatory regime for insurance companies (e.g. Solvency Capital Requirement under Solvency II)
- For the risk measure, the company could use Value at Risk...
- ... at a specific percentile of the warranty loss distribution.
- Risk or loss in the given context is perhaps best defined as the total cost of the payments required under the warranty claims...
- ... together with any potential losses arising from reputational impact on sales...
- ... e.g. in the event of a systemic problem which receives adverse media publicity
- Company may have some internal experience data on which to base the assessment of the probability distributions, particularly for “normal” claims.
- However, for the more “unusual” and “extreme” warranty claims it may need to use external industry data
- Or from 3rd party warranty providers.
- May seek input from experts.
- Claims experience may be analysed through breakdown and consideration of the underlying risk drivers.
- Each division (cars vs trucks) is likely to have very different claims pattern / experience.
- However, any correlation between the two also needs to be allowed for...
- ... bearing in mind that correlations may vary in the “tails” of distribution (which is what risk-based capital is based on).
- Company will need to set the total amount of capital required across both businesses...
- ... but may also allocate it to the cars and the trucks business units.

- Total capital required could be affected by whether business units are in legally separate subsidiaries, or part of a single company which shares financial resources.
- The company should really intend to meet “normal” warranty claims out of revenue (otherwise it is effectively expecting its sales to be loss-making). However, these may impose a liquidity strain on the company and the risk-based capital assessment could therefore include assessment of the potential costs arising from liquidity risk in extreme conditions.

An application question testing the general principles of risk based capital. Students again found this difficult, despite the relatively large number of points they could have made.

(vii)

- Obtaining sufficient volume of data on historic warranty claims or breakdowns may be difficult...
- ... if the company has not sold vehicles like this or offered warranties like this for any length of time before.
- External data may not be available.
- Or may be costly to obtain.
- If available, may be unclear how these will need to be adjusted to reflect the specifics of the company's products...
- ... including the atypical way in which they are used (e.g. trucks in demanding environments)...
- ... and the inherent reliability of the products.
- Also would need to adjust for any anti-selection by purchasers of 3<sup>rd</sup> party warranties compared with buyers of the company's vehicles.
- Calibrating claim distributions in the “tails” is particularly difficult.
- As is setting correlation factors for extreme events.
- Company may not have sufficient in-house statistical analysis and modelling expertise and it is too expensive to obtain it.
- The outcome is subjective and prone to error.
- Past experience may be a poor guide to the future (especially for a new product)
- Past data may also need to be adjusted for any quality improvements made in the production of vehicles since then.



An application question testing practical issues and considerations when computing risk based capital. Marks were better than part (vi) but continued to suggest students were not entirely comfortable with the material.

The capital allocation methods (e.g. earnings at risk or [revenue-cost-expected losses]/VaR are mainly used when discussing capital *allocation* (e.g. among divisions); they are less helpful for determining the *total level* of capital required.

(viii)

- Short-term share price appreciation vs long-term interests of the company needs to be taken into account.
- The proposals may just be creating perceived short-term benefits for shareholders, compared to the likely longer term consequences, including for other stakeholders such as the debt holders.
- Investigate whether increasing debt enhances the value of the company.
- Modigliani and Miller propose that the value of a company is determined solely by the asset side of the balance sheet and that the choice of gearing made by the company is irrelevant.
- However, the MM proposition also assumes that the financing decision does not affect other issues such as investment and operating policies...
- ... and assumes various (possibly unrealistic) things about a perfect market, including no taxes and lending rates equal borrowing rates
- The more debt the firm adds to its capital structure, the riskier the equity becomes...
- ... and thus the higher its cost (i.e. we should consider the impact on return on equity).
- Consider the existing gearing ratio, which may already be high
- Investigate the cost of raising additional debt
- Including the potential market/level of demand for it
- Investigate legality of issuing more debt or paying large dividends
- particularly in relation to any covenants present in other outstanding bonds or loans
- Investigate impact on credit rating...
- ... and hence cost of sourcing capital for other planned projects
- Debt financing has the benefit of tax deductibility.
- However financial distress and agency costs place limits on debt usage.
- Need to balance the added value provided by tax savings against the additional costs generated by financial distress in order to maximise shareholder value. (Trade-off theory).

- 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 investigate and consider.
- For this company, there is a case to hold some debt given it will have hard assets...
- ... and its day to day operations could require financing.
- Paying dividends (one-off or by increasing the ongoing dividend) will send a signal to the market about future prospects – how will this be interpreted? (e.g. does it indicate that there is no better use for the money within the company?)
- Paying higher dividends may be popular or unpopular with shareholders, for example due to tax considerations by the receiving shareholders.
- 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.
- Investigate the need for current cash balances.
  - Paying out large cash dividends to reduce cash holdings would need to be assessed in the context of the company's cash management requirements, which involves maximising the utility associated with the liquidity of cash relative to the opportunity cost of foregoing earnings from investment, allowing for the transaction costs of moving between the asset classes.
  - The company may specifically require cash to meet claims under its (new) warranty programme.
- Investigate alternatives:
  - The company could consider alternative transactions to paying out a cash dividend such as share repurchases ("buybacks")...
  - Mainstream corporate finance theory would argue that "accounting" transactions such as these have no effect on the aggregate market value of a company.
  - However, rational investors, operating in a perfect market, should understand the practical effect of any such adjustments to the number of shares in issue and use of retained earnings and respond accordingly.
  - There may be practical factors to consider, however, which will influence market value.

A wide-ranging question covering dividend policy and debt issuance with many "standard" responses scoring marks. Students scored acceptably on average, despite many marks available.

(ix)

- reducing the amount of capital held through a share buyback, which reduces available financial resources
- seeking to produce inferior quality cars and thereby (sharply) increasing warranty claims
- materially cutting back on research & development or advertising which reduces future income or makes products uncompetitive in future
- selling assets at unrealistically low prices / fire sales which reduces available financial resources or sacrifices future profits (selling at fair price or above should however not result in financial distress)
- draining cash resources by paying excessive compensation to staff (including most probably himself as director) which also reduces financial resources
- providing a less safe work environment for employees, potentially leading to future injury claims
- speculate with the company's funds, either through high-risk projects or by investing into risky marketable securities
- remove experienced management
- (rapid) expansion into projects or lines of business which have an initial cash strain, for example due to upfront R&D or marketing costs
- make poorly considered and hence value-destroying acquisitions  
*[Marks given other valid points]*

Most students were able to score useful marks here.

- Q2**
- (i) Callable bond = bond that can be redeemed (perhaps “recalled”) at the option of the issuer in line with predetermined conditions, e.g. price and outstanding term / at particular dates.
  - (ii) (a) A residential (house) mortgage often includes a prepayment option.

- (b) Mortgage holders may seek to “redeem” early (i.e. repay their loan and replace it with a new one) once interest rates fall below a certain level compared to the rate currently being charged on their mortgage.

Mortgage holders will also seek to “redeem” early if they sell their home.

Part (ii) was specifically expecting students to identify a situation involving individuals. Most students got full marks for these parts.

(iii)

- The company will have asymmetric information about its current and future financial position.
- By issuing callable bonds, the company gains a valuable option to modify its capital structure when circumstances make it advantageous to do so...
- ... without having to seek bondholder or market co-operation at the time
- In effect the company has the option to anti-select against the bondholders of callable bonds
- For example, if market rates have reduced ...
- ... or there has been an improvement in credit rating...
- ... it could call the bond and replace it by issuing a new one at a lower coupon.
- Current market structure may mean that investors (in general) are underpricing the call options they have effectively sold to the company meaning the company can capitalise on this mispricing by issuing more callable bonds at lower coupons than might otherwise be the case.
- There may be excess demand for callable bonds at the time of issue, allowing the company to issue them at lower coupons than justified.
- The company might want to issue callable bonds for matching reasons, for example because it is funding a portfolio or residential mortgages which may be subject to prepayment.

Students scored below average marks for this section.

(iv)

- All else being equal, the company will need to pay a higher coupon (or lower issue price) for a callable bond compared with an otherwise identical non-callable bond.

- This is to compensate the holder for the option the company has to redeem the bond at a time to suit the company which probably will not suit the investor.
- The callable bond will therefore increase the required return on debt.
- WACC can be calculated as  $(\text{Debt} / \text{Debt} + \text{Equity}) \cdot r_{\text{debt}} + (\text{Equity} / \text{Debt} + \text{Equity}) \cdot r_{\text{equity}}$
- For the same proportion of debt in the capital structure, this will increase the WACC which is a linear function of the required return on debt.
- The average WACC cost including future debt could be lower if the calls were able to be made profitably in the future.

Most students recognised that the company would be paying higher coupons for callable vs otherwise equivalent non-callable bonds to compensate bondholders for the ability to select against them and redeem the bond, and that this would ultimately increase the cost of finance.

(v)

- The bond is likely to be trading above its issue price  
This is because:
- The yield on the bond will have fallen due to the fall in market rates ...
- ... and due to the improvement in the company's credit rating
- There will be some offset since the call option is now further into the money
- But this would not be sufficient to offset the gain, as bond traders will be pricing in a call at some point in the future which won't necessarily be immediately.

This was a straightforward question but several students were unable to apply basic financial mathematics.

(vi) (a)

- The company could redeem the existing callable bond and issue a new callable bond with the same remaining maturity.
- It is likely this will attract a lower coupon than the in-service coupon, so the company's coupon payments would be lower.
- The company could redeem the callable bond and replace it with one that is not callable, or otherwise modify the terms of the existing bond so as to remove the call feature.
- This is likely to attract a lower coupon still than an equivalent callable bond.

- The company could redeem the callable bond and replace it with equity
- Equity dividends (allowing for tax aspects) may be cheaper to service than an ongoing coupon
- The company could provide (or increase) security for the bond, resulting in a better credit rating.
- This will allow the company to pay a lower coupon (it will need to modify the bond terms to do so)

(b)

- the reaction of bondholders to being selected against
- in particular their future willingness to reinvest into the company's bonds
- the legal ability to do this (especially as a replacement bond would likely be issued at the same time)
- the practical ability to do this with regard to available cash resources (the redeemed bond will need to be paid out, so ready cash resources or a simultaneous new bond issue would have to take place)
- the wider likely market demand for such bonds
- the costs incurred
- including any tax aspects of calling the bond and issuing a replacement bond

Students were able to score reasonable marks by identifying "obvious" factors – like costs, market reaction etc.
--

(vii) (a)

- A callable bond is equivalent to:
  - an uncallable bond of the same remaining terms plus
  - a call option sold by the investor to the company permitting the early redemption of the bond by the company
- The investor could undo the effect of the sold call option by purchasing an equivalent call option...
- ... in the market / from a bank / etc...
- ... granting him the right to purchase a bond with terms identical to the uncallable bond.
- The investor could enter into a suitable derivatives contract that pays out if interest rates fall (e.g. an interest rate put option); in this way the investor would be hedging against a macroeconomic scenario that would cause the company to want to redeem early (and refinance)
- The investor could enter into a suitable derivatives contract that pays out if the company's credit rating rises (e.g. a CDS); in this way the investor would be hedging against a firm-specific scenario

that would cause the company to want to redeem early (and refinance at better rates)

- The investor could enter into a total return swap which effectively swaps the callable bond's cashflows for an uncallable bond's cashflows, which retaining physical ownership of the callable bond.
- The investor could adjust his remaining portfolio so that the resulting callable-adjusted duration is closer to his requirements.

(b)

- The investor may be unable to find a suitable call option to purchase
- The seller of such call option would find it difficult to hedge their position if the bond is very illiquid.
- Illiquidity may mean there is inadequate market pricing information from which to price the relevant derivative accurately
- A proxy bond (issued by another company) which is more liquid may have to be used.
- Hence or otherwise the call option may be too expensive
- Or not possess the relevant features to offset the embedded call in the bond.
- The investor may not have the necessary expertise to deal in or manage options.
- There may be structural reasons why the investor cannot own free-standing call options.
  - e.g. tax reasons
  - e.g. capital adequacy
  - e.g. risk directives

Student answers were disappointing for these sections. Not all students read the question that the investor did *not* want to sell the bond, but was looking at ways of undoing (or hedging) the effects of the call feature. In simple terms this would require the investor to sell another security or make some other financial trade that offsets the call option owned by the company.

(viii)

- The M-M proposition is that (in effect for this purpose) stakeholders can undo the capital structure decisions made by the company within their own portfolio [and hence the company's value is unchanged by the structure decision].
- If the investor is able to undo the callable bond then overall no value has been created and the proposition holds.

- However, overall some value is destroyed because of the transaction costs of selling a more complex bond by the company and for the investor of having to undo the call feature.

Answers to this question were poor. Students struggled to link the previous question (vii) which effectively gave an answer that the investor may be able to undo the company's decision and hence no value would be created overall (ignoring transaction costs).

**Q3** (i)

- Cost savings from synergies (net of expected integration costs)
- For example due to shared resources such as IT, HR, and other back office...
- ...or from reduced need for property and other fixed overheads
- ... or through increased bargaining power with suppliers...
- ...or with brokers / investment counterparties
- Increasing market share or gaining a competitive advantage.
- Potentially forming a monopoly in one or more product lines.
- XYZ may be mature and have exhausted avenues for organic growth.
- Diversifying business risk and reducing reliance from just a few products for revenue.
- For example, ABC may run funds that are linked to different asset markets...
- ... or which have different fee structures etc.
- Gaining access to scarce skills, resources, expertise etc. that XYZ does not have currently; e.g. gaining access to a star fund manager.
- Gaining access to new markets; e.g. XYZ may not have any presence in the UK but wishes to gain it...
- ... both in terms of client base and product focus along with local compliance etc. expertise.
- ABC may have a strong and very long track record of investing in certain asset classes.
- Access to new distribution channels and client segments; e.g. retail / high net worth / institutions etc.
- Access to new/cheaper sources of capital e.g. ABC may be a listed company
- Or ABC may have a strong credit rating
- Replacing leadership and addressing succession issues; e.g. the founders of XYZ may be looking to retire
- ABC may have an excellent CEO and management team.
- Taking advantage of tax benefits
- e.g. tax inversion deals or tax credits / shelters of the target company.
- Survival – ABC may be long-term viable but have near term cashflow issues and it will not survive without being acquired by a larger and healthier firm.



- If either firm is privately held, this may be an exit route for other shareholders or way to monetise their holdings.
- They may be asked by the regulator or government to merge, e.g. during the financial crisis of 2008...
- ... particularly if the companies were assessed to pose a systemic risk to the asset markets.
- XYZ may have surplus cash resources, which it is looking to deploy.
- ABC may be cheap to buy (e.g. it is trading at a depressed market price).
- ABC may wish to prevent a takeover from someone else (i.e., XYZ is acting as a white knight).
- There may be regulatory domicile advantages (either ABC or XYZ and hence possibly also the merged entity may be primarily regulated in an advantageous location).

This was a relatively easy question with many marks available and most students scored highly.

- (ii) The Prudential Regulation Authority (the PRA) is responsible for the prudential regulation of all deposit-taking institutions, insurance providers and large investment firms.

If Companies ABC or XYZ are deemed to be systematically important investment firms, or the merged entity would be so deemed...

... their merger will be mainly subject to the regulations of the PRA in the UK.

Otherwise it will mainly be subject to the regulations of the FCA.

The Financial Conduct Authority (the FCA) is responsible for regulation of conduct in financial markets (and the infrastructure that supports those markets) and the prudential regulation of financial services companies that do not fall under the scope of the PRA (e.g. insurance brokers and smaller investment firms).

Regulation will be based on the FCA and PRA handbooks of rules and guidance...

... which are based on “principles based” regulation.

In addition, company XYZ will be subject to the financial regulations of the country where it is domiciled

e.g. the SEC for the US, which may have different regulatory requirements.

The merged entity may now be subject to multiple regulators (the UK regulators and its existing regulator(s)).

Capital market regulators will try to ensure that there is a “level playing field” and that all shareholders can act on the basis of the same information.

This may prevent XYZ from retracting an offer, except in exceptional circumstances.

There will also usually be a strict timetable for divulging information.

If either firm is listed, then the firm would need to comply with the rules and requirements of the local listings authority.

e.g. the UK Listings Authority which reflects requirements that are compulsory under the relevant European Community Directives...

... as well as the additional requirements of the Financial Services and Markets Act 2000.

With respect to mergers, the rules intend to ensure that holders of listed equity securities should be given adequate opportunity to consider in advance...

... and vote upon ...

... major changes in the company's business operations and matters of importance concerning the company's management and constitution.

If XYZ is raising finance to complete the merger, it will need to comply with the relevant market rules where that finance is raised.

If tax related savings were part of the rationale for the merger, there may be further scrutiny from the local tax authorities

e.g. recently the US changed the rules to make cross border (tax inversion) mergers more difficult etc.

The merged entity may now need to consider UK taxation issues.

The merger is likely to require approval from the various regulators with respect to competition, monopolies and fair trading controls.

The competition regulator(s) may demand the merged company take certain actions to satisfy competitive concerns.

Regulatory concern is mostly aimed at protection of the interests of customers (particularly individuals) and suppliers. Regulators are normally acting under national legislation and have responsibilities to national constituencies.

On the other hand company XYZ is multinational. Potentially company XYZ may therefore argue that a takeover resulting in a high market share in one territory (UK) will not confer unacceptable pricing power because of the potential entry of international competitors. It is, of course, entirely up to the regulator as to how these arguments are treated.

The definition of the product is generally a second area of debate for competition decisions. A high market share in a narrowly defined product area (e.g. a specific and popular unit trust) may translate into a much lower share of a more widely defined product category that, the company may argue, contains supposed substitutes for the product under review. In the UK there is likely to still be plenty of competition and substitute investment products post such mergers.

Fair trading controls also aim to ensure that sellers do not exploit members of the public who may be in a weak bargaining position  
e.g. increasing the fees or decreasing the service levels of the investment funds on offer.

Fair disclosure of inside information will be regulated...  
... under the Market Abuse Directive (MAD)

MiFiD (Markets in Financial Instruments Directive)...  
... sets out the allocation of responsibility between “home” state and “host” state for companies carrying out investment business in other countries.

Firms that comply with MiFiD will, in general, have to comply with the Capital Requirements Directive (CRD). For firms not previously covered by the ISD this could mean being required to hold minimum capital amounts for the first time.

MiFiD was also set up with the aim to promote more competition.

In terms of the valuations agreed for the merger, the firms may need to be aware of appraisal rights in some jurisdictions  
i.e. the right of a dissenting stockholder to require the purchase of his or her shares at their fair market value as determined by an independent party, preventing corporations involved in a merger from paying less than the company is worth.

Accounting standards may differ between the two firms (e.g. GAAP vs IFRS)...  
... resulting in information exchange or audit complications.

Moving or laying off staff as a consequence of the merger would need to be in accordance with the relevant local employment laws.  
There may also be specific legislation relating to the treatment following the merger of any pension schemes run by the companies.

This was less well answered despite many marks again being available. Nearly all students identified competition regulations as a concern but struggled to generate many of the other points, like staffing issues, and the supervision by (possibly several) regulators post merger.

- (iii) XYZ would be required to divulge information on its holdings in ABC at some point, so it could not stay “behind the scenes” indefinitely

E.g.:

- All shareholdings above 3% or 5% to be declared to the regulators.
- Once XYZ has built up a 15% or 25% stake in a company's shares by purchase in the open market, there must be a pause before further shares are purchased.
- If XYZ acquires more than, say, 30% of a company's shares, it must then offer to buy all the remaining shares.
- Once a full bid has been formally launched, the bidder has a limited period (say, 60 days) to win control of the company (unless a rival bidder intervenes).
- If a bid fails, the XYZ cannot bid again within a specified period (say, one year).

Other issues with purchasing lots of shares on the open market:

- XYZ will incur lots of transaction costs
- including stamp duty.
- XYZ may only be able to buy non-voting shares, and therefore not gain any control
- A large part of ABC's shares may be tightly held or have a small free float ...
- and this may mean it will take a very long time to build up a meaningful stake, or ...
- in an extreme it is likely to push up the share price of ABC significantly.
- it may result in lots of press headlines and increased scrutiny from regulators etc.
- a hostile approach will make it more difficult to obtain financial information about ABC
- a hostile approach may cause ABC to implement various defensive measures
- a hostile approach is likely to cost XYZ more money than a friendly merger

Many students scored marks for the "bookmark" aspects of the question – e.g. the shareholding triggers for notifying the exchange or being obliged to make a formal offer, and made reasonable attempts at the other points.

(iv)

- The company can set up various poison pills such as:
  - Shareholders rights plans – where “friendly” shareholders can purchase additional company stock at an attractive price.
  - Voting rights plans – separates certain shareholders from their full voting powers at a predetermined point. The presence of corporate predators may also trigger super-majority voting, which requires that a full 80% of shareholders approve a merger, rather than a simple 51% majority.
  - Business alteration agreements – make various contingent arrangements to alter the nature of the business (e.g. by selling off a division) in the event that the merger/takeover proceeds
- The company can set up various poison puts such as:
  - Giving lenders the right to demand repayment of loans if there is change of control.
  - Having break clauses in contracts with clients (investment management agreements), suppliers, brokers and other counterparties, upon any change in ownership.
- Triggered option vesting – A triggered stock option vesting strategy for large stakeholders in a company can be used as a defence, which may dilute XYZ's potential stake.
- White knight – a friendly strategic partner that counter bids or merges with the target company.
- Greenmail – ABC may pursue a greenmail strategy by seeking an alternate buyer for the stock held by XYZ (probably at a higher price than paid by XYZ) in order to avoid a takeover.
- Increasing debt – By increasing debt significantly, ABC may hope to deter XYZ by raising concerns about its financial health post the acquisition.
- Staggered Board of Directors, in which groups of directors are elected at different times for multi-year terms; this can be challenging for XYZ, which now has to win multiple proxy fights over time and deal with successive shareholder meetings in order to successfully take over the company.
- Acquiring the acquirer – ABC may try to purchase XYZ in order to avoid a hostile take-over and be in a better position to set terms for the combined business.
- Making an acquisition – preferably through stock swaps or a combination of stock and debt. This has the effect of potentially diluting the XYZ

ownership percentage in ABC and makes the takeover significantly more complex and expensive.

- Structuring equity into voting and non-voting shares, where only the latter are available in the open market.
- The ABC board should make an announcement explaining why the offer from XYZ undervalues the company or issue statements recommending that shareholders reject the offer.
- ABC could have a share buyback – thereby reducing the free float or (if possible) buying and cancelling the shares of some investors who would otherwise have supported the merger.
- The ABC board could actively solicit counter-bids from other suitors – this would drive up the price XYZ would have to pay and while the transaction may ultimately still complete, ABC shareholders will be better off.
- ABC could lobby regulators or politicians to deny permission for the deal to proceed.
- ABC management could "talk up" the share price by issuing favourable earnings forecasts, thereby increasing the price XYZ would have to pay to gain control.
- ABC could make a large cash distribution to shareholders, thereby reducing the attractiveness to a predator.

An easier section which most students scored relatively well on.
--

- (v) Compensation for the risk of the deal breaking or extending (an insurance premium).

Provision of liquidity to the shareholders of the target company (ABC).

The shareholders of ABC have already received a significant and unexpected gain (so willing to accept a lower price now to exit their position, rather than wait to be paid out later through the transaction).

In the case of a narrow deal spread the potential for further upside is limited relative to the gain already made.

The terms and mechanics of the deal may be highly complex, creating a lot of uncertainty around the actual value to be received in return for the holding in ABC shares.

In the case of stock deals, the ABC shareholders might not be natural holders of the acquiring company (so willing to sell below the offer price).

The probability of deal break and the magnitude of likely loss (given ABC's share price may drop sharply should the deal not go through) is difficult to estimate and likely to change over time, hence investors would need a premium above just the risk free rate (to compensate for the time value of money).

The profit is likely to be greater the fewer investors actively target these trades.

The offer proceeds may be subject to a reduction for tax (i.e. the amount shareholders will get is below the stated offer price).

The market price may be misleading, for example due to a large bid-offer spread or high transaction costs; therefore an apparent mispricing disappears once actual acquisition costs are allowed for.

If the transaction is completely without risk (i.e. certain to go ahead on the disclosed terms), then the expected return from a merger arbitrage trade would be equal to the risk-free rate over the same period.

This was difficult. Some students misunderstood the merger arbitrage trade aspect – i.e., the question was about an investor seeking to profit from *an already announced deal*. The question was not evaluating the merger itself.

(vi) Deals may fail as a result of issues arising during due diligence...

... or failure to receive regulatory approval.

One of the most common reasons relates to anti-trust (or competition) law.

Another example (particularly in the US) has been the authorities clamping down on mergers or acquisitions that were primarily driven by tax savings for the acquirer (tax inversion deals).

The deal may be hostile and not have approval from the management of the target company

It may be politically sensitive (e.g. if the deal is likely to result in lots of local job losses) and hence experience opposition from local or national politicians

There may be too many issues arising in relation to the jurisdiction of the companies concerned (i.e. disagreements among several regulatory authorities including anti-trust commissions).

Any deal pre-conditions may not be met (i.e. any obligations on either company which are not satisfied)

Either set of shareholders may reject the deal (assuming they are given a vote)

In a hostile situation the target company may apply a range of defence tactics including white knights, greenmail, etc.

If the deal involves payment of cash to the target shareholders, the buying company may be unable to raise the necessary finance.

The transaction may trigger adverse tax consequences in the hands of one or both sets of shareholders (e.g. crystallise a gain causing a CGT liability), causing them to reject the deal.

Market prices may move up in the interim, making a (cash) offer no longer attractive.

A competing bid may trounce the offer.

The target company's circumstances or financials may worsen in the meantime such that the acquirer abandons the transaction.

Any prescribed timetables not adhered to or some other procedural error is made during the takeover, making it lapse.

This was handled better. The question had moved away from the specific merger arbitrage trade to be more general and many students were able to generate a reasonable number of points.

(vii)

- Stock deals:
  - The strategy involves purchasing the stock of the target company post announcement of the deal and selling short the stock of the acquiring company at the same time...
  - ... in the relevant ratio...
  - ... thus harvesting the relative performance differential between the two stocks.
  - The rationale for shorting the acquiring companies is to lock in the value to be received once the merger transaction completes and target company shares have been exchanged for acquirer company shares.
  - Being long the target company is necessary to generate the expected profit as the target price and offer price tend towards each other as the deal completes..
  - Having a market neutral trade is often desirable, particularly if the hedge fund manager does not have a view on the direction of the equity markets and wants to minimise his exposure to it.



- Market risk would be reintroduced if the deal collapses, and each share price reverts to a level reflecting current prospects.
- If it was felt that the deal is highly likely to break (e.g. due to the offer being made undervaluing the target company), the hedge fund manager may decide to be long the acquirer and short the stock of the target company.
- Cash deals
  - The strategy simply involves purchasing the stock of the target company and waiting to receive the cash payout when the deal completes.
  - Some argue that it is desirable to hedge these deals using short equity index futures or long equity put options, thereby providing insurance in case the overall market falls significantly and the acquirer backs out of the transaction.
- The necessary positions for either type of deal could be obtained via derivatives rather than in the physical market.
  - For cash deals, the hedge fund could invest in call options which would increase in value as the stock price trends towards the offer price while at the same time providing a limited loss feature if the transaction fails (a bull spread could be even more effective as upside is limited in this type of transaction).
- There is scope for increased complexity in these transactions based on the specifics of the merger agreement.
  - e.g. the deal could involve a combination of cash and stock
  - Other adjustments may need to be made if the two companies are based in different jurisdictions, or are traded on different exchanges.
  - Currency exposure can be an issue depending on where the companies are based and what their activities are, and based on this the manager would need to decide which exposures to hedge out etc.
- Merger and acquisition events may also distort the valuation of either company's other traded instruments (e.g. corporate bonds, loans, convertible bonds, equity options, CDS etc.).

- Hedge funds can look to exploit these anomalies by looking to go long the undervalued security and short an appropriate expensive security etc.

The question moved back to the merger arbitrage situation and students again found this difficult. Many students didn't consider both the cash and stock alternatives as laid out in the question.

(viii)

- risk-free rate at point of implementing trade (cost of capital)
- probability of deal break or completion ...
- ... and likely losses / gains on deal break or completion
- probability and magnitude of increased deal spread due to counterbids/bidding war
- market risk factor (beta)
- average merger-arbitrage risk premium at the time
- level of leverage applied to the trade in order to increase returns
- leverage costs
- frictional costs such as trading costs...
- .... taxes, stamp duty...
- ... dividends...
- ... stock lending costs for any shorted securities...
- ... the time value component of any options purchased (offset by the time value component of any options sold)
- ... and liquidity risk at the time of trading
- currency gains or losses where the offer is not priced in Sterling

Another poorly answered question. Several of the possible points are fairly typical – e.g., costs, taxes, market movements – but students struggled to identify even these. Many of the other points were only made by well-prepared students.

(ix) Possible key risks that could be described are as follows:

- Deal failure:

There is a risk that the deal fails / does not go through.

Although deal breaks may be deemed to be a relatively low probability event...

... the loss once a deal breaks is quite high...  
... due to the price of the target company moving significantly.

The impact of broken deals is potentially worse for small/illiquid target companies as exiting a trade could lead to a greater market impact.

- Risk of deal extension:

The time to complete a deal is also uncertain (typically 100 to 120 days), so there is a risk that the premium is realised over a longer period than originally expected...

... and therefore the realised rate of return to the investor would be lower.

- Systematic risk factors:

Market or other systematic factors can result in a drop in the stock price of the target.

This increases the risk of a deal break...

... or of resetting the offer price to a lower level (in both cases, resulting in a loss on this trade).

Examples of these risks include:

- industry downturn
- economic or business cycle downturn
- financing shocks
- change to more onerous regulatory environment
- ownership risk
- currency risk, if the stocks of the companies (and the financing to pay for cash deals etc.) are all in different currencies it introduces currency risk

- Specifics for stock deals

There is a risk that the stock of the acquiring company may also rise in price from depressed post-announcement levels...

... leading to a loss on the short position (if held).

- Specifics for cash deals

Unhedged cash deals are more prone to the risk of large equity market falls.

In addition, if the equity market falls significantly, it is possible that the likelihood of deal breaks also increases.

- Liquidity

There may be liquidity risk.

Some deals, in particular smaller deals, involve stocks that are less liquid. Hence, it may be more challenging to borrow stock in order to short sell the target company, or to get out of the trade on short notice.

- Reputational risk

There are risks relating to inappropriate or badly timed press coverage.

Mergers will tend to be in the press when they are announced and the progress of the merger can be tracked quite publicly. Investors should be prepared for deal breaks (and the subsequent portfolio losses) to be widely reported, which could exacerbate market impacts.

- Crowdedness

There is a risk that trades become very popular and thus for the prospective risk adjusted returns to be eroded over time.

This effect may be amplified at times when there aren't many deals occurring.

Crowded trades also risk potentially more volatile return profiles should a market event result in everyone trying to get out of the trade at the same time.

- Operational or counterparty risks

Where derivatives are used, there is a risk that derivatives counterparties fail, resulting in losses unrelated to the trade itself.

- Leverage

The hedge fund is likely to have borrowed money to enhance returns which would result in magnified losses if the deal collapses; such losses could result in fund insolvency.

Students scored acceptable marks, aided by a long list of potential points that could have been made for a relatively small expected total.

(x)

- (Assuming they want the deal to go ahead,) both boards will be concerned that if the price rises too far then XYZ may be forced to match this (e.g. because ABC shareholders demand it) and may even have to abandon the deal if it can no longer afford to complete it.

- (Assuming they want the deal to go ahead,) both boards will be concerned that shareholders will reject XYZ's offer if it is now below the increased ABC share price.
- An unstable increase in price (or volatility of price) may make it harder to reach agreement on any revised offer price.
- The price rise may be based on insider trading, suggesting possible legal risks for one or both companies.
- The price rise may indicate that XYZ is accumulating shares (a particular concern for ABC's board).
- The speculation may lead to "real world" effects (i.e. suppliers / customers reacting adversely).

Most students scored well on this question.

(xi)

- XYZ could structure the deal to offer shareholders of ABC new shares in XYZ (that way, if the rise in ABC price is matched by a similar speculative rise in the price of XYZ shares, this would restore some of the attractiveness of the transaction).
- Suspend trading in ABC until the deal terms are final.
- Extend the merger timetable to allow prices to settle down again.
- If insider trading is a concern, publish information as relevant and identify and stop the source of any leaks.
- Agree a cap on the consideration if ABC share price rises above a trading range (this may prevent speculators driving the price beyond that level).
- Implement the above through options on ABC stock.
- Rather than basing the consideration on market capitalisation value, the offer could be based on other (non mark-to-market) company valuation measures such as a fixed multiple of book value, earnings or total enterprise value etc.

Students struggled to think of answers here, even where they had identified some issues in part (x). Several students identified pauses in trading or timetable extensions as plausible ways to control market volatility.

**END OF EXAMINERS' REPORT**