INSTITUTE AND FACULTY OF ACTUARIES

EXAMINERS' REPORT

September 2014 examinations

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 at the date the examination was set. Candidates should take into account the possibility that circumstances may have changed if using these reports for revision.

F Layton
Chairman of the Board of Examiners

December 2014

General comments on Subject SA5

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 just one possible set of acceptable answers. Candidates are awarded marks for all reasonable answers including different but still reasonable numerical solutions. Marks are awarded for working in the case of numerical answers.

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. Some points are more fundamental to the correct answer but, in the main, candidates earn one-half mark per correct point up to the limit of marks available for the question.

Comments on the September 2014 paper

Question 1 was based on a relatively simple Private Finance Initiative example. PFI typically involves private sector companies building and owning an asset and the public sector committing to a long-term usage contract. The complicating factor in this question was that the construction company wanted to fund the asset by issuing an index-linked bond. Many candidates were not as familiar with index-linked bonds as they should be. Questions 2 and 3 were partly theoretical questions based on relatively recent and well publicised financial events. Question 2 was a timely question about the consequences of keeping interest rates very low. Question 3 was based on the much publicised discussion of the role of credit default swaps in the 2008 global financial crisis.

Past SA5 exams have often had questions based on relatively straight-forward case studies and questions based on well publicised events or circumstances.

Most candidates attempted answers to every question. Overall, questions 2 and 3 were reasonably well-handled by many. In contrast, many candidates scored relatively poorly in the index-linked bond section of question 1.

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.

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, life insurance and general insurance companies function.

Well-prepared candidates scored acceptably well across the whole paper. The comments that follow the questions concentrate on areas where candidates could have improved their performance.

1 (i)

- PFI is a form of public-private partnership (PPP)
- The Council requests bids from interested private sector contractors to build and then operate the airport
- Private sector contractor funds airport required by Council
- Contractor then paid for service
- Here the contractor would raise finance and build the airport and then be paid an (annual) amount for running the airport

[2]

Many candidates scored full or near full marks for this question.

(ii)

- Good and sustained competitive process for awarding tender / contracts
- Encouragement of creativity and innovation to reduce costs
- Payment made for service not assets
- Create single private sector contact point to simplify contract management
- Transfers risks from public to private sector where private sector better equipped to manage them

[2]

The question refers to the PFI process and not PFI as an investment for an investor. This said the question was handled well by most. As ever, marks were given for other reasonable answers including the possibility that planning permission might lapse reducing the value of the land.

(iii)

- Council does not have ability to raise the finance it needs itself
- Council lacks expertise in managing project of this scale and / or running construction projects of this kind
- Council does not want to be involved in / lacks resources to oversee construction project
- Council believes private contractor would do a better job of managing the construction project
- Council believes it can save money by employing private sector expertise
- Council believes there is material risk of cost overrun, construction delays and/or failure. Council wishes to pass these risks on.
- This avoids the need for public expenditure at the beginning of the project; instead payments are made for the service as it is delivered.
- Competitive procurement process can ensure that the public sector secures the best available deal
- Private sector creativity and innovation can result in an asset better able to deliver the ongoing (airport) service requirement

[4]

Many candidates scored full or near full marks for this question.

(iv)

- Payments to contractor are fixed hence contractor can increase profit by reducing costs and so the contractor may deliver substandard construction project to save costs / increase profits (e.g. use inferior materials)
- Also the contractor may deliver substandard service (e.g. using fewer frontline staff)
- Council may need to take over or otherwise intervene if project not on track or under threat of not delivering expected benefits e.g. contractor goes bankrupt
- PFI is intended to be both a better and more cost efficient solution. It might not end up being so depending on many factors. For example the operating contractor may be able to increase charges in the pursuit of profit to a level that makes the PFI the more expensive option.
- Bid/Contract documents inadequately prepared and specified – leading to problems on delivery (e.g. inappropriate works, fail "fit for purpose" test)
- Inadequately specified client requirements, leading to construction changes during contract (and punitive costs)
- Unintended/unforeseen consequences in contract specification that conflict with local economic development objective (The classic example of this was Inverness airport, where the PFI contract had to be bought out as the embedded per person charging structure was subsequently found to be harmful to the Scottish Development Agency local objectives.)
- Local objections to airport development ("NIMBY") may pre-empt development
- Political or regulatory changes or interventions that change the long-term economics /viability of the project.

[4]

The question was handled well by most. Almost all candidates made three or four of the above points but many made no further points.

(v)

- Key aspects to consider include:
  - Current market environment
  - Nature of underlying contract (the contract to build and manage the airport)
  - Requirements of likely investors into such bonds. A review of the terms and conditions of similar bonds in the market together with market price should provide useful guidance.
  - Term of index linked bond compared to term of PFI concession (e.g. for a lender, a bond of 25 year term issued on a PFI concession of 30 years, is likely to be acceptable, 30 years on a 30 year concession would not)
  - The structure of the future airport revenue stream (i.e. proportion due to service charge, proportion due to ancillary services)
- Current environment dominated by very low interest rates
- Index-linked bond coupon and principal will increase over time in line with specified index

- Investors may find rising coupons attractive given lack of high yield alternatives
- Low current interest rates may suggest future inflation, making case for holding inflation-linked assets
- Airport service charge likely to increase in line with inflation
- Index linked bonds may not be appropriate, if underlying contract payments themselves to not increase with inflation (it is likely they will, but this is not stated nor given)
- Underlying income therefore well matched to inflation-linked payout
- Investors likely to be those with long-term real liabilities, e.g. pension funds, providers of long-term replacement cost insurance
- Attractiveness of bond will depend on availability of direct alternatives (e.g. government and corporate IL bonds) and / or credit spread or term relative to such alternatives
- The project is likely to have a lead time of 3–4 years (if not longer) before the airport is operational and income (service payments) starts to be received from the Council. This gives rise to a number of issues.
- An index linked bond issuer requires a coupon to be paid – typically every 6-months. In the earliest years – there would not be any project income to service the coupon. The issuer would have to be prepared to accept some form of deferred coupon structure.
- If the company raised all the finance required at the start of the project, it would have a cash pile to invest pro-temp until drawn down to meet the construction costs incurred over the, say 3–4 year build period. The FD would have a mis-match between asset (cash) and liability (index linked coupon payments). (The FD might prefer to raise the index-linked bonds in tranches – however, costs of small scale raisings might negate this approach (compared to a single raise.)
- The risk profile of the construction phase is very different from the risk profile of the operational phase (once airport completed). Unless a step-down in coupon (due to lower risk premium) was embedded in the debt raised, an index linked issue would be very costly compared to a nominal issue.
- It would be more appropriate to use some form of project finance (bond) funding to cover the construction phase (as short-term, e.g. 3–4 years, inflation linkage would not be that significant for investors). Long-term inflation linked bond funding could then be sought (at more favourable pricing) to replace the project finance for the term required.

[10]

There were a wide range of relatively poor answers. Many candidates showed a very limited understanding of index-linked bonds. Also many candidates would have likely benefited from thinking about the circumstances of the question for a little longer before attempting to answer it. For example, current market conditions will be a key consideration for any new bond issue. Further, the airport service contract is likely to be an increasing cashflow stream which could provide some ability to match an index-linked liability and also that the airport project would essentially involve an initial zero-income cashflow-negative construction phase followed by an income-generating operational phase.

(vi)

- Company may have no index-linked cashflows outside the airport contract
- Unless bonds have recourse to airport cashflows only, company taking on potentially large risk if inflation increases and particularly if inflation rises sharply
- Company has no obvious way of hedging itself
- If bonds have recourse and company loses contract, may struggle to make index-linked repayments
- Index-linked bond market is smaller than the nominal bond market. Increased risk of not selling all of the bonds at tender.
- Basis risk between the index in the contractual receipts and that of the bond
- Corporate index-linked market is shallow and thinly traded. Marketability may be poor and investors may require an additional premium to invest.

[5]

There were a wide range of relatively poor answers for the same reasons as given in part (v) above.

(vii)

- Will cashflows from airport service contract only be used to meet bond repayments? (i.e. does company have portfolio of similar contracts elsewhere, whence cashflows could be appropriated?)
- Term will depend on expected length of airport service contract allowing for one or more likely renewals
- Company may wish to repay bonds sooner if possible (e.g. airport goes up in value, sell to another operator, retire debt)
- Market demand will also influence term (i.e. if investors desire and are willing to pay a premium for a particular term)
- If available, start with interest rate on risk-free inflation linked bond of similar maturity (i.e. government issued)
- Next add credit spread for riskiness of issuer, taking into account revised corporate structure and cashflows once service contract in place
- Adjust spread if airport contract is ringfenced (i.e. no recourse to other company cashflows)
- Choice of index should be one that matches likely rate of increase in airport service charge
- Company must consider how to meet bond repayment – probably by selling airport itself or selling PV of future service charges if contract still has time to run
- Likely to offer airport itself as security for bond repayment
- Will the Council provide any guarantees? How certain are the underlying contract payments (e.g. do they depend on minimum revenue from the airport or will the council top up the amounts?)
- Security for coupons most likely to be service charge payments – consider length of any contractual guarantee and / or consider ringfenced cashflows
- Determine whether company has any other cashflows it could use to meet coupon payments and / or maturity payment

- The FD will want to raise the finance as cheaply as possible, so different tranches may be issued with different terms.
- The degree of subordination will influence the terms, e.g. senior, junior, mezzanine
- If finance raising is staggered (or drawdown is staggered), the stage of the development (i.e. how far construction has advanced) and the term remaining until the airport is operational (revenue flows through)
- The credit rating of the construction company, its track record in PFI and similar projects
- The "credit standing"/quality of the Council/Local Authority awarding the PFI contract.
- The proportion of the revenue stream due to the Council's airport service charge compared to any ancillary services/exposures on the development (e.g. ancillary economic development sponsored by the company at the airport site)
- The Interest Cover
- The terms and "safeguards" offered by restrictive covenants (gearing levels, distributions, interest covers, etc.)
- Any unusual construction techniques being used as part of the development
- The quality of the management of the SPV, their experience of the industry and the extent (and strength) of service level agreements in place (e.g. long term maintenance, etc.)
- The range of investors the index-linked issue is being offered to e.g. exclusive club of 5–10 large insurers/ pension funds vs open market offering
- Existence of options to extend airport concession (e.g. provides additional "security" on debt, if investor can extend repayment term (by extending concession term) – rather than fully defaulting)

[13]

There were a wide range of relatively poor answers for the same reasons as given in part (v) above. Most candidates were able to make the order of 10 valid points. Thirteen marks were available for the question suggesting that the examiners were looking for more than 20 valid points.

(viii)

- Shareholders are lowest ranked in capital structure
- Prefer higher return investments to compensate for higher risk of loss of capital
- Bondholders do not participate in corporate success other than through rerating of bonds (benefit not enjoyed if bonds held to maturity)
- Bondholders prefer conservative strategy, reduced leverage, earmarked assets to repay capital
- Shareholders prefer strategy which maximizes residual assets, prefer unencumbered assets

- Bond holders may insist on restrictive covenants, which, for example, may limit distributions to shareholders or include interest rate ratchet (upward) mechanisms for different cover levels

[3]

The question was handled well by most. Almost all candidates made three or four of the above points but many made no further points. Some candidates recognised that shareholders like leverage as it improves returns but there is a limit. Shareholders do not want a company to become insolvent because of a short term liquidity problem that has been triggered by excessive debt.

(ix)

- The shareholders believe that the level of bond coupon payments and / or principal repayments are too large relative to the company's cashflows and assets suggesting that any shortfall in cashflow or assets would have a material impact on their residual value
- The volatility of the residual value is significantly increased if the bond value is very large relative to available assets, i.e. if debt\equity ratio is high
- Increases risk of bankruptcy
- The bondholders may collectively wield undue influence over the company's affairs (e.g. by insisting on restrictive covenants for future borrowing, limiting payments to shareholders, etc.)
- The airport project is clearly very large relative to the size of the company. The shareholders may prefer some of the construction costs to be funded with a rights issue to reduce leverage although as shares are usually more expensive than debt this could lead to the contractor company not making its original forecast return on equity from the PFI transaction.
- Shareholders may also be concerned about the inflation linkage of the coupon and principal repayments and the basis risk with the airport income receipts
- The shareholders may also be concerned that the concentration of risk in one significant project is excessive (and prefer the construction company to invest in a more diversified portfolio of projects by size (and sector)

[4]

Many candidates scored full or near full marks for this question.

(x)

- Retire other debt so that total D/E ratio reduces
- Obtain external guarantees (e.g. from town council to repurchase airport)
- Ring fence the bond liability against certain assets (e.g. bond coupon met only by airport service charges; principal repayment only by airport sale) thereby protecting the remainder of company assets
- Limit any covenants imposed by the potential index-linked bond holders to a SPV set up for the airports project. This would enable the construction company to continue to operate in other areas without undue restriction imposed by the airport project lenders.

- Cap the inflation linkage on the bond repayments – this would help to reduce the extent of any basis risk/mismatch in times of very high inflation

[3]

[Total 50]

Many candidates scored full or near full marks for this question.

2 (i)

- Typical central bank's role might include some or all of
  - maintaining the integrity and value of the currency
  - maintaining the stability of the financial system
  - seeking to ensure the effectiveness of the financial services sector
  - deliver price stability (defined by the Government's inflation target)
  - support the Government's economic policy, including its growth and employment objectives
- In many countries, central banks are now primarily concerned with monetary policy and control:
  - adjustment of banking sector liquidity
  - control of money supply growth and short-term interest rates

[3]

The question asks for a role and the answer combines both roles and objectives. The difference between a role and an objective can be confusing. Candidates were given credit for answers with just roles, just objectives and both. In any event, most candidates handled the question well.

(ii)

- Certain monetary policy aims may be at odds with government aspirations
- E.g. boosting employment may require lower interest rates (such that firms have lower cost of debt service and are encouraged to borrow and invest). However this may be incompatible with higher interest rates needed to combat inflation
- Central bank which is not independent will be persuaded to act in a manner which aids government (popularity, reelection) or government allies (connected corporations and individuals)
- Historical evidence is that politically controlled central banks are unable to act in fulfillment of monetary objectives, esp. control over inflation or to maintain integrity and value of currency

[3]

The question was handled well by most. As ever, marks were given for other reasonable answers including that the implied independence is from the government and most governments change personnel and policies relatively frequently. This short-termism reduces the effectiveness of monetary policy.

(iii)

- ECB set up in 1999 to oversee monetary policy within the European Monetary Union
- Its monetary policy is intended to achieve price stability across the zone
- Individual countries however retain control over their own fiscal policy and government debt programs
- The ECB is able to issue debt securities whose interest rate is substantially based on the creditworthiness of its member countries and therefore requires agreement from at least the main member countries (e.g. Germany, France) in order to operate effectively
- In addition, the governors (leaders) of the ECB are appointed by the member countries, and each will to some extent represent his / her home country's policies and intentions
- Consistently achieving agreement among the key member countries who may have different fiscal policies is likely to be very difficult, as witnessed during the ongoing Eurozone debt crisis
- It is therefore unlikely that the ECB is able to operate truly independently
- Member countries may seek to use the ECB as fiscal policy tools (e.g. by permitting or denying certain types of debt instruments to be used as bank reserves, by seeking to issue multi-country bonds or by requiring the ECB to lend selectively to financial institutions in some countries)
- EU institutions and national governments are bound by treaties to respect the ECB's independence – which is instrumental in maintaining price stability.

[6]

The question was handled well by most.

(iv)

- Base rate = rate at which banks borrow in sterling from the Bank of England
- Serves as benchmark for other rates
- Set by central bank supplying daily required liquidity shortfall in banking system at a set rate
- Central bank buys treasury bills or other eligible instruments held by banks at specified discount rate
- Also by printing new notes
- Effectively the rate at which banks can borrow as much as they need to keep their liquidity at the required level
- Base rate likely to be the marginal price of new funds for the bank
- i.e. all other borrowing by the bank at same or lower rates (e.g. to depositors, for the same term, they will get less ignoring marketing considerations designed to encourage new savers)
- Marginal price then sets rate at which bank will lend money
- Bank needs to make a profit
- Therefore best credits will borrow new loans at base rate + profit margin
- Worse credits borrow at base + spread + profit (profit may increase with higher spread)

[3]

Many candidates scored full or near full marks for this question.

(v)

- Low interest rates encourage borrowing for both spending and investment
- This results in higher demand for raw materials and finished goods
- Ceteris paribus (i.e. absent an increase in production), this leads to inflation
- Provided the low level of base rates translates into low levels of borrowing rates, the zero rate policy is expected to boost aggregate demand
- Poor quality borrowers will also be more likely to be able to service their debt than default while rates are low because of lower interest expense
- Bad debts should therefore reduce
- This protects credit institutions' balance sheets
- Banks may also benefit from larger spread between low borrowing cost and proportionately much higher charge for loans
- Results in inflow through improved credit spread
- If lower interest rates result in higher demand for borrowing, and banks are willing to lend, then bank balance sheets will expand

[6]

Many candidates scored full or near full marks for this question.

(vi)

- Credit spreads may increase so that effective borrowing rates are not lowered
- Banks may be restricted from lending for regulatory or prudential reasons, e.g. higher reserve requirements restricting total lending volume
- Borrowers may simply choose not to borrow, e.g. due to higher levels of uncertainty in the economy overall
- Lower overall interest rate does not necessarily imply a higher lending appetite from banks (banks may be seeking to unwind loans irrespective of rates)
- Borrowers may be trying to deleverage, with no interest in taking on new loans (e.g. delaying purchase of new big-ticket items like cars and home appliances)
- Bank reserve requirements may have increased, preventing credit extension despite demand from borrowers
- The period of sustained low interest rates followed a period of major economic upheaval with very significant job losses – making individuals reluctant to borrow
- Borrowers may be concerned about the speed at which interest rates might rise in the future – leading to concerns around an inability to repay a new loan in the future

- Disposal incomes may have fallen in real terms, following a period of low (nil) wage growth and high sector inflation (e.g. utility bills and foodstuffs) – loan "affordability" may have declined.

[4]
[Total 25]

The question was handled well by many. Almost all candidates made three or four of the above points but many made no further points.

3 (i) True because:

- The value of a CDS is inversely-correlated with the value of a bond. Therefore, they can be used to protect a portfolio of bonds against market movements.
- The value of a CDS will increase if a bond is downgraded as the likelihood of default has increased; hence the pay-out is proportional to the "sum at risk".
- The issuer of the CDS will pay the holder if certain risk events crystallise.

False because:

- Issuers of CDS are not regulated to the same extent as insurance companies.
- In particular, the issuer is under no obligation to hold reserves to cover potential losses.
- A CDS may not need to be collateralised.
- There are no statutory checks that the issuer has sufficient capital to cover any losses.
- Hence a CDS can be used to bet on a market movement without any intention on the part of the issuer to provide insurance cover.
- In the event of a default event, the issuer can declare bankruptcy and avoid paying the insurance.
- A change in value of the swap can be triggered without any claim event happening, just a change in market perception.
- There is no cap on the amount of insurance that can be purchased.
- True insurance involves pooling of risk, which is not a requirement of a CDS.
- A buyer of a CDS does not need to hold the underlying bond instrument. In this instance where the buyer has a "naked" position, it does not have an "insurable interest".

[6]

Most candidates made points similar to the reasons as to why the assertion is true. Many candidates were not able to make any valid points as to why the assertion is false. The above answer contains all of the main reasons.

(ii)

- The outstanding positions of CDS issuers are often intertwined with each other. Even though the net positions may be small the gross positions may be large.
- This became exacerbated following the sub-prime market collapse when credit spreads increased.
- In the event of a credit event there is a risk that the netting of exposures may not apply in practice.
- A reduction in the outstanding amount of CDS can be achieved by netting off contracts when positions are closed out rather than by issuing new contracts to achieve the same effect.
- In order to do this across the market it is necessary to standardise contracts as far as possible. Since contracts were issued over the counter this was not common.
- Examples of elements to standardise are:
  - effective dates,
  - contract sizes
  - consistent treatment and definition of credit default events.
- Following standardisation it is then possible to reduce gross exposures between multiple counterparties by reproducing the same net exposure using a smaller volume of contracts or by adjusting portfolios and agreeing offsetting payments if not theoretically possible.
- Introducing central counterparties can also lead to the gross volume of CDS contracts reducing.
- Although this initially doubles the number of contracts per trade, it allows the multilateral netting off of contracts which leads to an overall reduction in volume.

[6]

The question was handled well by many. Many candidates made other valid points including:

- *The notional amount of outstanding CDS refers to the par amount of credit protection bought or sold and is used to derive the premium payment calculations and the recovery amounts in the event of a default.*
- *Although notional amount is a useful measurement tool, it is problematic due to its mis-interpretation as some measure of risk. Netting of obligations generally reduces credit exposures to a small percentage of the notional amount.*
- *The CDS market expanded rapidly in the period leading up to the financial crisis – in the latter stages driven by investors seeking protection against reference entity default (and also by speculators looking to capitalise on potential defaults).*
- *The lack of transparency (and regulation) in the CDS market was a cause of increasing concern to regulators at that time.*
- *It is generally acknowledged that concerns about levels of exposure (and potential concentrations of exposures) among reference entities (and counterparties) caused significant market uncertainty (and volatility) at that time.*
- *A consequence of the financial crisis was an evolution in the behaviour of bankers and investors. For example,*
  - *The risk appetite (and "risk capital" available) for some investors reduced*

- *Portfolio compression (i.e. the netting off of exposures) was endorsed by the market for CDS*
- *Some investors – having realised the scale of their previous exposures and the potential for a domino effect within the market – scaled back their CDS portfolios in line with their more realistic risk tolerances.*
- *The degree of "naked CDS exposure" (c80% pre crisis) in the market, (taken generally by speculators) reduced.*

- *Following the crisis, moves by the CDS market towards centralised clearing and standardisation of contracts (which enabled contracts to be directly offset against each other, rather than requiring a new contract to be struck to close out an OTC position) further helped to reduce the notional amount of CDS outstanding.*

(iii) The Government could ban over-the-counter deals and instead insist that transactions take place through a central clearing house.

The Government could insist on regular audits of credit default swaps dealers in order to ensure they are adhering to the rules and regulations.

The Government could impose a sales tax on these forms of CDS derivatives.

A penal tax rate could be imposed on gains from derivative positions.

Regulation could be altered to make the risk charge on these assets prohibitive under solvency regulations for banks and insurers.

Tighter regulation could be imposed on the issuers of credit default swaps to control supply and demand and ensure that counterparties have appropriate collateral.

Holding credit default swaps without the underlying security means the holder gains when stocks default. The Government could ban holding "naked" positions on CDS and insist that they be covered.

… or ensure that gains from these positions in stress situations could not be counted by financial institutions in their solvency metrics.

… and monitor the extent to which short positions are affecting the market in times of underlying turbulence and takes steps to restrict or stop this activity.

The Government could insist that credit default swaps are brought under insurance regulation as they share many characteristics of an insurance contract. This would bring capital requirements and insurance regulations to swap issuers.

[5]

The question was handled well by many. Almost all candidates made four or five of the above points but many made no further points.

(iv) Problems the Government might encounter are:

The definition of what constitutes a credit default swap is not clear. Hence there may be opportunities to create securities that bypass the regulations but are still technically credit default swaps.

The cash-flow characteristics of a credit default swap may be recreated using a combination of other securities, thereby achieving the same result without being labelled a credit-default swap.

For example, futures could be used to provide swap-like characteristics.

Determining whether a holder of a CDS has a naked or covered position at any one time will be difficult.

Contracts do not necessarily employ a standard definition of a credit event. A default is clearly a credit event and other forms of event include bankruptcy, a credit downgrade, a deferral of payments and changes in currency of payments are typically allowed. However, litigation has resulted over disputes about what constitutes a credit event.

[3]

Many candidates scored full or near full marks for this question. Additional points included that the CDS business could move overseas and outside of the government's jurisdiction.

(v) The target return might be measured using a typical risk adjusted performance measure where the amount of capital required to cushion the organisation against expected losses is determined, or by establishing the capital by determining the earnings at risk and a target return.

Whichever basis is used it will be important to understand the precise definition that the manager has been set and whether the assumptions underpinning that metric are appropriate.

In particular, in determining a target rate of return, the underlying assumptions of the target should be determined. In particular, if historic data is used, is it still appropriate and relevant and is it consistent with other targets that the company has discussed with any other stakeholders, for example a return on equity.

The manager may be investing for multiple businesses within the organisation which have different targets. It will be necessary to understand how the risk-based capital is allocated between different businesses in order to determine whether an overall target is appropriate or if overall targets are set then the allowance for any diversification between business units in deriving the risk-based capital.

The definition of the risk event that is driving the amount of capital held would need to be assessed. Either the event might be considered inappropriate

(in this case, a change in interest rates might be considered without a change in credit spreads) or the level or probability ascribed to the event that is used to determine the risk-based capital could be inappropriate.

The treatment of any exceptional items in the calculation should be considered as to whether they are appropriate to reflect in a performance metric, for example, if a significant corporate event had happened and the extent to which the Investment Manager has been able to influence the return that he is being assessed on.

Economic capital can be defined as "the amount of capital a firm should hold to keep its realistic balance sheet solvent following a series of events that might be considered as unexpected yet still reasonably likely to occur in practice".

As there is an opportunity cost in providing (underpinning) capital, the allocation of capital is often used as a basis for performance measurement.

[5]
[Total 25]

Whilst not required, additional marks were given for stating a formula such as:

- *RAPM = (Revenues – costs – "expected" losses) / VaR*
- *Risk capital = Earnings at risk / Risk-free rate.*

The question was handled well by many.

END OF EXAMINERS' REPORT