INSTITUTE AND FACULTY OF ACTUARIES

EXAMINERS' REPORT

April 2022

SA7 – Investment and Finance
Specialist Advanced

Introduction

The Examiners' Report is written by the Chief 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 Specialist Advanced (SA) and Specialist Principles (SP) 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.

Sarah Hutchinson
Chair of the Board of Examiners
July 2022

© Institute and Faculty of Actuaries

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

The aim of Investment and Finance Advanced (SA7) is for the student to develop a broad working understanding of financial and investment markets, across all major areas of investment expertise. The intent is to achieve expertise up to a level that allows for critical analysis of others, rather than up to the level of full specialist expertise in any particular area.

Candidates should ensure that their answers are sufficiently detailed to demonstrate understanding, as there were instances where inadequate explanations led to candidates scoring less well on questions than they might have done. The model solutions are intended to reflect the level of detail that a high scoring candidate might be able to produce. For many questions there are more marks available than the question requires to achieve full marks. This reflects that the examiners will give credit for valid alternative solutions, particularly in questions focussed on higher level skills.

Candidates who make relevant and well-reasoned points, not in the marking schedule, are awarded marks for doing so.

B. Comments on *candidate performance in this examination.*

Most candidates answered all four questions, with Questions 3 and 4 being more challenging on average. Candidates tended to score less well on the higher order parts of questions, however scored well on knowledge and application parts of questions. Well prepared candidates were able to score highly across the four questions demonstrating their ability to apply their SA7 knowledge and techniques to a range of familiar and unfamiliar scenarios.

Candidates are reminded to ensure that their answers are relevant to the scenario. Candidates are also reminded that to score well they will need to cover a broad range of points, particularly on the longer question parts.

With the computer based format candidates benefit from the ability to carry out calculations in Excel. It is important that assumptions are stated and intermediate steps shown for calculations are shown so that maximum credit can be given.

C. Pass Mark

The Pass Mark for this exam was 59
96 presented themselves and 28 passed.

Solutions for SA7 – April 2022

 © Institute and Faculty of Actuaries

Q1

(i)

QE impacts equity prices as described below, and an equity investor can profit from anticipating moves in equity prices [1]
QE involves a central bank printing money [½]
The new money is used to purchase government bonds and other fixed interest securities [1]
This causes the demand for these assets to rise, resulting in an increase in the price of these assets, ceteris paribus [1]
This can happen when the QE programme is announced, as the assets are bought, or a combination of both [1]
Higher bond and fixed interest security prices mean that the yields on these assets fall [1]
This can make equities more relatively attractive as an investment [1]
and can boost equity valuations if they are based on a discounted cash flow method using bond yields [1]
The purchase of the bonds and fixed interest securities also starts a ripple effect in financial markets [1]
Those who sold the bonds and fixed interest securities to the central bank will be unlikely to want to hold cash instead [1]
and will likely want to purchase other investments in their place [1]
This increases the demand for other assets, including equities [1]
and ceteris paribus, it will likely lead to an increase in equity prices [1]

Speculators will also likely expect this impact and may look to front run the demand for other assets driving up their prices [1]
Low fixed interest security yields will likely encourage corporations and other institutions to issue more bonds [1]
and will likely use some of the proceeds to buy back their own shares [1]
This is especially the case when yields are close to zero or negative [1]

[Marks available 16 ½, maximum 9]

(ii)

Some central banks use the money created by QE to directly purchase equities in the form of purchases of equity exchange traded funds (ETFs) [1]
This increases the demand for equities, resulting in equity price increases, ceteris paribus [1]
Equity prices might increase as the QE programme is announced, or as the equities are purchased, or a combination of the two [1]
Speculators will likely try to front run the equity purchases, further adding to the upward price pressure [1]
The Bank of Japan [1]
and the Swiss National Bank [1]
both purchase equities as part of their QE operations [1]

[Marks available 7, maximum 4]

(iii)

Because QE increases asset prices, it causes a wealth effect [1]
Those with assets become better off in proportion to how many assets they have [1]
and depending on the type of assets they have [1]
The wealth effect stimulates economic activity, aiding economic growth [1]
Assets include items like houses and other aspirational lifestyle assets [1]
As these increase in price they increase the aspirational cost of living [1]

 © Institute and Faculty of Actuaries

e.g. young people have to save more money to buy a house [1]
This reduces their demand for the more normal goods that make up the consumer price index, resulting in a somewhat deflationary impact on these goods and services [1]
Wages and salaries are usually linked to consumer prices, meaning wages and salaries are unlikely to keep pace with the aspirational cost of living [1]
QE effectively drives economic growth by driving down wages relative to the aspirational cost of living [1]

[Marks available 10, maximum 7]

(iv)(a)
Bond holders have no upside potential beyond their expected coupon and principal payments [1]
whilst being exposed to downside risks. [½]
Conversely equity holders have significant upside potential [½]
and exercise day to day control over the company. [1]
Therefore equity holders can improve their position at the expense of bond holders [1]
through their powers of control. [½]

[Marks available 4½, maximum 3]

(iv)(b)
Possible conflicts can include:
e.g. Equity holders underinvesting in a company to increase profits, whilst reducing long term security for bond holders. [1]
e.g. Equity holders influencing management to take excessive risks, increasing the default risk of the firm (at the expense of bond holders, but not necessarily for equity holders on an expectation basis). [1]
e.g. Equity holders taking excessive dividends from the company, reducing asset cover of liabilities (including payments due to bond holders). [1]

(v)
QE results in the prices of equities and bonds rising [½]
and financing costs for issuing new equity and debt fall. [½]
Equity holders will find that the cost of buying back debt has risen due to falling interest rates, [½]
whilst the cost of raising new debt has fallen. [½]
This creates two incentives:
to lengthen the maturity of debt to lock in rates and reduce refinancing risks [1]
to maximise the amount of debt that is issued subject to there being a purpose for the funds [1]
and there being no negative impact on the company's credit rating [1]

Over a period of time this can lead to companies becoming more indebted since the costs of debt capital have fallen for companies with strong balance sheets. [1]
Whilst the costs of equity capital have also fallen in nominal terms, many companies have continued to buy back equity with excess cashflow to support their share prices. [1]
This will in general reduce security for bondholders. [1]

This has been exacerbated by another conflict of interest, that between employees and shareholders, [1]

 © Institute and Faculty of Actuaries

and the increasing proportion of compensation paid in the form of shares, particularly to senior management. [1]

[Marks available 10, maximum 8]

[**Total 34**]

This question was answered reasonably well by most candidates.

Part (i) was overall well answered although some candidates provided unnecessary detail on how QE works before answering the question.

In Part (ii) only well prepared candidates were able to describe in detail how central banks have purchased equities as part of a QE programme.

Part (iii) To score well in this part candidates needed to describe the effect of QE on consumers' wealth and consequential impacts on price inflation.

Part (iv) Well answered by most candidates.

Part (v) Well prepared candidates provided a longer-term narrative of how QE will lead to changes in capital structure which meant they score less well and observed that companies will be incentivised to lengthen their financing to lock into attractive rates for as long as possible.

Q2

(i)

Funds backing bond payments:

What is the total expected grant inflow over time and could this change if additional countries pledge additional funds? [1]

Should some form of payment be requested/demanded from the farmers or will the project be 100% funded by the grant money? [1]

Instead of receiving monetary amounts from farmers, could any of their assets be used as collateral? [1]

In the case where farmers are asked to contribute financially, what are the options to limit the credit risk associated with such payments? [1]

How much money will need to be raised immediately and will there be any funds be required at a later date? [1]

Is there anything which could lead to a reduction in the grants paid out by the countries (e.g. natural disasters) [1]

or a delay in grant payments. [½]

Can guaranteed contracts be put in place with governments who have pledged grant money. [1]

[Marks available 7½, maximum 5]

Bond structure:

Should the bond be issued in a single currency, or can there be different bonds denominated in different currencies? [1]

What will be the repayment structure:

Fixed or increasing coupons [½]

 © Institute and Faculty of Actuaries

Payment holiday [½]
No Coupons [½]
Allow early repayment with no fees [½]
What additional features can be put in place to make investing in the bond more attractive [1]
Should a specific credit rating be sought [1]
[Marks available 5, maximum 4]

Sales and Marketing:
Should specific potential investors be targeted by the way the bond is structured and marketed? [1]
How much detailed information can be communicated to the capital market about the source and identities of those financing the project. [1]
Would highlighting the strong ESG element of the project being financed by the fund allow lower returns to be offered? [1]
Will some investors require a stringent governance process to ensure funds are used as expected? [1]
Will some investors have a desire to get involved in key decisions? [1]
Target investors could include ESG focused funds, companies operating in the sector that want to invest to strengthen their ESG credentials, endowments and foundations [1]
[Marks available 6, maximum 5]

(ii)
Risk and Return:
Will OTC derivatives be available to hedge the risks under these bonds? [1]
How do the returns for these bonds compare against similar fixed income alternatives as well as assets with a similar risk profile? [1]
Do the bonds in differing currencies have equivalent returns? [1]
Are there any tax benefits from investing in these bonds [1]
Will there be a secondary market for the bonds [1]
Does the coupon and principal profile match the underlying expected grant profile [1]
How will prepayments affect the return achieved [1]

Investment Suitability:
Will investment in these assets allow any internal ESG investment requirements to be met? [1]
Does the current structure provide additional benefits beyond the return (e.g. diversification benefit, cashflow matching, marketing benefit)? [1]
What alternative risk metric can be used for this bond in the case where the credit rating is not appropriate (e.g. when the Association handles all cash flows)? [1]
[Marks available 10, maximum 6]

(iii)
Legally binding contracts:
The guaranteed contracts will reduce the likelihood of countries not paying the pledged amounts. [1]
However in the event of a government default this clause will not ensure payment in full, [1]
although the contract may provide seniority over other creditors. [1]
In a scenario where insolvency is linked to conditions that trigger payment under the weather derivative the recovery would be higher. [1]

 © Institute and Faculty of Actuaries

25% reduction to nominal:
The callable feature would significantly impact the cashflows and overall return if it happens in the early stages of the investment as all coupons are lost, in addition to 25% of the nominal amount. [1]
If the bond is called closer to maturity then the loss will be mainly 25% of the nominal. This risk is then be comparable with a bond that defaults and has a 25% loss given default. [1]
The definition of natural disasters used by the Association is also important and could be narrow or wide. Examples could include weather events, famine, disease. [2]
Although the bond may be callable, the Association are unlikely to call all bonds because they may not have the funds to do so. [1]
The Association may also be reluctant to call the bonds if it damages their ability to access funding from the capital markets in future. [1]
Depending on the definition of natural disasters, the callable feature is a material risk. [1]

Weather derivative:
The weather derivative mitigates the loss due to the callable feature when payments at the same time as bonds are called. [1]
In this case, some of the nominal amount is recovered but all the coupons are still lost. [1]
It is important to note that the derivative may not always pay when the bond is called because the definition under which it pays may be more stringent than what constitutes a natural disaster. [1]
This could be related to the percentage change being much higher, or the timing of measurement impacting whether or not a natural disaster would be detected. [1]

Investment bank:
Using an investment bank to facilitate payments will reduce the operational risks associated with the Association handling the payments. [1]

[Marks available 16, maximum 10]

(iv)
The callable feature significantly increases the risk of losses being made on the overall investment. [1]
The contract clause, weather derivative, and use of an investment bank seek to limit the overall risks so would justify a reduction in coupons. [1]
However a new risk has been introduced of prepayment with a 25% reduction in principal, which would result in lower returns, which would warrant a higher coupon rate. [1]
Overall, the expectation should be that coupons are increased. [1]

[Marks available 4, maximum 2]

[**Total 30**]

This was the best answered question on the paper.

Part (i) was well answered by candidates.

Part (ii) Well answered by most candidates.

 © Institute and Faculty of Actuaries

Part (iii) Well answered by most candidates. It was disappointing that only a few candidates highlighted that a 25% reduction in the event of a natural disaster could be a larger reduction in value than if the bond continued, particularly if the weather derivative paid out.

Part (iv) Well answered by most candidates.

Q3

ESG considerations could be brought into the following areas for a new private credit product:

Investment objectives – the new fund could have explicit ESG objectives within its guidelines. [1]
This could be to have a positive social or environmental impact through the investments made. [1]
This could include objectives be to target investments in certain sectors or regions [1]
(e.g. microfinance, renewable energy, etc). [1]

Security selection – the process for determining which securities or issues to acquire could include ESG related factors. [1]
This could include screening against specific industry sectors or activities (e.g. weapons manufacture, gambling), consideration of human rights policies, or carbon footprint. [2]
Under an integrated approach the valuation of a bond could be adjusted to reflect ESG risks or adjustments to return (e.g. if it is designated a green bond by ratings agencies). [1]

Portfolio construction – the overall portfolio could be reviewed to ensure it meets a specific threshold for each ESG factor. [1]
This could include measures such as total carbon footprint, [1]
weights to specified negative activities (e.g. alcohol, tobacco, etc.) [1]
or by reference to ESG scores using third party metrics (e.g. MSCI). [1]

Exercise of ownership rights – within the investment process there can be clearly specified criteria for how voting rights are exercised, [1]
including in the event of a debt for equity swap or restructuring of the debt. [1]
This could be based on the environmental or social consequences of votes, or other engagement activities. [1]

Reporting – the manager could commit to making detailed disclosures covering the following aspects: its policies, ESG characteristics of its portfolios, or other disclosures. [2]

As a debt investor, there is limited scope for the manager to engage with companies it invests in beyond the initial investment decision. [1]

[**Total 18**]

 © Institute and Faculty of Actuaries

This was reasonably well answered question,. It was necessary to cover at least three of these in detail to score full marks (credit was given for other relevant comments). Some candidates provided unnecessary background information on ESG approaches rather than directly answering the question, which will have lost them valuable time.

Q4

(i)

The primary consideration will be to set the risk appetite based on the following factors:
Charity - Risk appetite is increased if there is:
Scope to reduce expenditure to adjust to a declining Fund value. [1]
Scope to secure significant other sources of funding if necessary to offset a declining Fund value [1]
(e.g. grants, donations, sponsorships, royalties, license fees) two examples [1]

Endowment fund - Risk appetite is increased if there is:
A lower level of annual spending as a proportion of assets. [1]
A low level of future commitments (e.g. undrawn commitments to private equity or other private markets programmes) [1]
High levels of liquidity within the Fund's assets. [1]

This view of risk appetite will then need to be overlaid with "real world" constraints:
Documentation: there may be additional constraints within the Fund's governing documentation that will result in the level of risk taken differing from the risk appetite. [1]
Market views: this will need to be overlaid with views on the current investment environment which may result in more or less risk being taken. [1]
This is particularly the case for liquid investments (e.g. listed equities or bonds), where there is scope to adjust the asset allocation relatively quickly. [1]
Distribution rate: where the rate of distribution is a high proportion of the asset base, and there is a desire to grow the Fund net of distributions, [1]
this may result in the level of risk being taken being higher than the risk appetite would suggest. [1]
The consequences of the overall level of risk being out of line with risk appetite for the stability of the charity's activities should be understood by the Investment Committee and, if necessary, the Board. [1]

[Marks available 12, maximum 8]

(ii)

Advantages (for treating co-investment as part of the investment portfolio):
Ensuring that the co-investment is integrated into the Fund's reporting and governance processes will provide greater clarity to the Charity and stakeholders as to the overall success of the Fund. [1]
This approach would also mean that the co-investment is categorised as an illiquid private equity investment [1]
when managing the Fund's strategic asset allocation [1]
This approach also avoids the Fund adopting a higher return target than necessary [1]
and ensures the Fund maintains a suitably high level of liquidity at an overall level to meet its needs [1]

 © Institute and Faculty of Actuaries

As clarity on the success of the co-investment emerges, the assumed level of investment return will change from a discount cashflow calculation to an accounting valuation. [1]
This approach will ensure that the return target for the investment portfolio is understood as the position evolves. [1]

Disadvantages:
From a strategic asset allocation perspective, the co-investment will distort decision making for the investment portfolio. [1]
This reflects the large (20%) and undiversified nature of the co-investment, [1]
and its uncertain outcome. [½]
It is likely that the Fund and the Charity will have little day to day control of the joint venture so this will be a distraction. [1]
If the co-investment is unsuccessful (40% probability), then it is likely that the Fund will have targeted an insufficient level of return during the development phase of the joint venture. [2]
Conversely the alternative treatment would have led to a level of return targeting that would ensure the Fund is more likely to be on track, assuming it was successful in managing its investment portfolio. [2]
Overall there is no right approach, since the success or failure of the co-investment will be a strong contributor or detractor from the overall success of the Fund in achieving its objectives. [1]

[Marks available 15½, maximum 10]
[**Total 18**]

This was the least well answered question on the paper.

Part (i) only well prepared candidates listed the factors that might influence risk appetite.

Part (ii) Where candidates discussed both the advantages and disadvantages of such an approach they scored well. Some candidates commented on the suitability or otherwise of the co-investment in the context of the Fund's objectives and distribution, which wasn't relevant given that this question related to implementation and governance rather than the original investment decision.

[Paper Total 100]

END OF EXAMINERS' REPORT

© Institute and Faculty of Actuaries