Actuarial Society of South Africa

EXAMINATION

28 May 2012 (am)

Subject F205 — Investment Specialist Applications

EXAMINER'S REPORT

The standard of scripts was rather disappointing in general. Candidates are not expected to think of all the aspects covered in the solutions (which in themselves do not contain everything that could be included in an answer) especially when it comes to the more abstruse points. However, there are plenty of opportunities for candidates who are thinking clearly and approaching the problems with a common sense approach to earn enough marks to pass. Failure to draw on material that is in the course notes is one (extreme) example of candidates' carelessness in answering questions and needlessly costing themselves marks.

Some candidates have a tendency to latch onto a few points and discuss them in long-winded detail. However well they elucidate those points it will never compensate for lack of covering the topics in the breadth that is required. Candidates whose answers consist of long paragraphs almost certainly fall into this category and should practice a more concise style that will show them more clearly how thoroughly, or not, they have answered a question. These suggested solutions attempt to convey such a style and can serve as a guide.

Once again there was evidence of some candidates failing to pay close attention to the questions asked and consequently producing answers that were irrelevant or poorly focused. This can very easily mean the difference between a candidate passing or failing.

Question 1

a)

SRI concepts are not at all new yet surprisingly many candidates seemed to lack enough knowledge to tackle this question with any conviction. The subject is perennially topical and there is a very informative section in the course notes that was relevant yet many candidates gave poor answers.

- Trustees are required to invest the members' funds prudently – i.e. in such a way as to ensure maximum returns at an acceptable level of risk
- The requirement of diligence is increasingly being interpreted such that it is incumbent on investors also to ensure that they do not invest in companies that profit at the long-term expense of society, leading to what economists call "negative externality"
- ... and to actively invest in companies whose activities promote or sustain the common good

- Conversely, in the absence of ethical standards, the profitability of companies may be unsustainable over the long term, or they may be open to lawsuits or regulatory action
- The trustees may be influenced by recent examples where poor governance has led to punitive actions against companies such as the crippling fine that the Competition Commission is proposing to levy on Eskom for abuse of its monopoly position; or the fines imposed on BP after the oil spill in the Gulf of Mexico
- Trustees must also balance short-term and long-term investment returns
    - With SRI this conflict is often evident because benefits tend to emerge only over long periods of time

- Capital markets and financial structures function in a way that alienates the end investor (in this case the scheme member) from having influence on the investments of the scheme
- There is an asymmetry of information and power w.r.t. investments
- The trustees may wish to address this imbalance and exert a more direct influence on investments on behalf of the members – i.e. SRI can be a form of shareholder activism
- In SA this emphasis is particularly acute because of a history that excluded many from meaningful participation in the economy
- In some cases SRI could be extended to promoting BBBEE

- The trustees (and members they represent) may distrust the mechanisms of pure market capitalism and their effectiveness in driving ethical behaviour in companies and in allocating capital to the most socially worthwhile projects

- SRI is a trend that is being embraced increasingly internationally and trustees may be influenced by overseas practice
- In 2006 the UN produced its Principles for responsible Investments (UNPRI)
- In SA this was highlighted by the introduction in 2011 of CRISA, a voluntary code widely endorsed by financial institutions and the FSB
- Regulation 28 specifically requires Trustees to consider SRI as part of their investment strategy
- Consequently consultants may be encouraging the trustees to incorporate SRI into their investment framework

- It is no longer assumed that SRI will result in lower returns and hence the compromising of members' financial interests
- Many international studies support the belief that SRI produces superior returns
- There is a body of evidence - including meta studies - that suggests that SRI results in superior returns in the long term
- This may be because a correlation of sound ethics with sound management
- ... or the increased transparency leading to better risk management
- ... or avoidance of costly class-action lawsuits (e.g. cigarette companies) or regulatory action/penalties
- Trustees could believe in the "early-mover" advantage – if other schemes follow suit, it will support the price of those companies in the SRI index (i.e. higher returns)
- ... and this would improve performance to repair the fund's deficit

- Trustees may wish to give effect to the investment choices of their members
  - Who may feel strongly about specific SRI issues that are close to home
    - o Like labour relations, community engagement, AIDS etc.
    - o Or avoid certain sectors for ethical or religious reasons (e.g. Shariah-compliance)
- By establishing and applying ethical criteria trustees are better able to ensure that investments will meet the investment criteria of the members

b)

There is a wealth of information that candidates could have mentioned on this topic - even if they were unaware of the specifics of the situation, since SRI criteria are generic to a very large degree. Despite the ubiquity of discussion in the financial media about governance, and ESG in particular, many candidates floundered and were unable to produce even a moderately informed answer.

The criteria are based on the principle of "triple bottom line" accountability i.e. Environment, Society and Financial sustainability

o With good corporate governance (linked to King III standards) underpinning each

There are 3 main themes: Environment, Society and Governance related Sustainability Concerns (ESG). Within each category specific areas assessed include:

- ENVIRONMENT

o A company should continually seek to improve its environmental performance by:
• working to reduce and control its direct negative environmental impacts;
• promoting awareness of its significant direct and indirect impacts;
• working to use natural resources in a sustainable manner; and
• committing to risk reduction, reporting and auditing.

- SOCIETY
- o A company should demonstrate a commitment to social sustainability and good stakeholder relationships by:

  • treating all stakeholders with dignity, fairness and respect, recognising their rights to life and security and free association, and their rights to freedom from discrimination

  • actively promoting the development and empowerment of its employees (i.e. training & development) and the community

  • ensuring that core labour standards are met and good employee relations maintained; and

  • working to promote the health and safety of its employees,

  through the use of targets, monitoring performance against targets and reporting on performance.
- o Critical issues such as HIV/AIDS and black economic empowerment (BEE) are measured separately

- GOVERNANCE AND RELATED SUSTAINABILITY CONCERNS
- A company should:

  • uphold and support good corporate governance practices as the foundation for its business policies and practices, through strategies to achieve and maintain internationally recognised corporate governance standards and implementing sound ethical practices;

  • work towards long term growth and sustainability by assessing and managing the risks to sustaining its business while adapting to changing demands, trends and macro-economic driving forces;

  • identify and manage the broader impact of the company within the company's sphere of influence or where the company operates from a social, environmental, ethical and economic perspective, directly and indirectly.
- Areas of measurement include
- o Board practice
- o Code of Ethics/Conduct
- o Indirect impacts
- o Business Value & Risk Management
- o Broader Economic Issues

CLIMATE CHANGE
- From 2010, the specific category of climate change as an additional focused area of measurement.
- o Managing and reporting on efforts aimed at reducing carbon emissions to deal with the anticipated effects of climate change

The measurement focuses on how companies integrate the principles emerging from each of the areas of measurement into their existing frameworks of governance and activities across the following business areas.

- POLICY AND STRATEGY
- o Commitment can be demonstrated through public statements, policies and/or strategies, which should ideally be publicly available.
- o Implementing management and performance measures can in certain instances also be sufficient to demonstrate commitment, e.g. where the nature of the system negates the need for an additional policy statement.

- MANAGEMENT AND PERFORMANCE
- o Systems, including the use of targets, objectives and other initiatives to manage, monitor and measure business activities, progress and performance against targets.
- o While this is already included in some areas, the Index will continue its evolution towards increasing performance measurements throughout the Criteria.

- REPORTING
- o The fundamental principle to reporting is to provide stakeholders with access to information about aspects of the company's business activities within a reasonable time period, ensuring that relevant

information is available on a reasonably regular basis. This goes beyond the publication of glossy reports.
- The Criteria indicators define the minimum content that should be covered by reporting for purposes of the Index.

c)

It was evident that most candidates were unaware of the make-up of the JSE SRI Index. Many assumed, wrongly, that it is skewed towards smaller counters when in fact the reverse is true. This error alone was not irredeemable – provided candidates were able to consider many of the issues that would be pertinent regardless of how the index is constituted.

<u>Governance considerations</u>
There is considerable potential for conflicting views

- The merits of SRI are not universally acknowledged and there is room for debate; there could be strong resistance from other trustees or the sponsoring employer
- Given the low funding level the change could be especially contentious
- Priorities when setting SRI criteria differ from person to person and the criteria might not satisfy all stakeholders
- Will need to update investment policy statements and communicate changes to members
- Members/trustees may find it difficult to explain/accept underperformance relative to the SWIX

<u>Portfolio implications:</u>

- The ALSI SWIX is a broader index covering 160 shares whereas the JSE SRI covers only 74 stocks (2010)
- So less diversification is attainable with the SRI index
- The universe is growing slowly – by about 5 companies p.a. – so diversification will improve
- There is a SWIX version which alleviates the concentration in a few stocks
- More importantly the SRI index includes 36 of the top 40 shares but only 33 mid cap and 5 small cap shares
- So it is heavily weighted to the largest shares on the JSE and would exclude the scheme from investing in many mid and small caps
- Despite this the performance of the SRI Index has closely followed that of the J203 to date
- As a result would not expect the change to have much impact on returns, and hence funding levels

- But the fund will not participate in any mid cap outperformance in future
- A positive is that there should be no liquidity constraint in the equity portfolio
- The ALM impact needs to be assessed to take into account the risk/return characteristics of SRI vs. SWIX and the risk budgets must be reviewed

<u>Implementation implications:</u>

- The change of universe will require the sale of those stocks not currently in the SRI index
- Even though most of the large cap stocks will not be affected, a significant proportion (possibly more than 10%) might be
- There will be costs associated with the rebalancing: brokerage, MST and market impact costs for a portfolio which is presumably several Rbn large
- These costs will impact performance in the short term – a blow the fund can ill afford now
- Fund may want to consider use of specialised transition manager to minimise costs of trading and transition
- The risks around timing the switch need to be managed – e.g. selling smaller cap stocks below their potential value
- The asset manager must be able to manage to the new universe
- this could be difficult if their processes do not easily allow them to map their house view portfolio onto the new universe
- or if the mapping results in portfolios with undesirable risk characteristics

- Mandates will have to be reviewed as e.g. tracking error limits may have to be revised
- Where performance fees are payable, manager may not be willing to use SRI benchmark
- It is possible that a new asset manager will need to be chosen with associated costs and risks
- Management fees for may be higher than for straightforward house view portfolios

Question 2

Again this is a topical issue that candidates were required to put into a specific, South African, context. With a modicum of knowledge of the crisis in the EU backed up by basic economics candidates should have been able to score reasonably well here. Yet most attempts were weak or worse.

This sort of broad question, worth a substantial number of marks, benefits from a structured approach in the answering. Identifying the items that would warrant comment, and then giving the facts relevant to each, enables the candidate to cover the topic in the required breadth. It also avoids the haphazard grasping at disparate facts that typified too many responses and caused candidates to give fragmented answers that were far too light on content.

a) i. Impact on ZA economy

- The Euro-zone crisis – which is in essence a rebalancing of economic imbalances caused by injudicious borrowing to fund current spending in the past - has resulted in a severe reduction in growth with many European economies in recession and growth in the rest anaemic at best
- In order to stimulate growth EU interest rates are being kept very low and monetary policy is exceptionally loose
- But fiscal policy is stringent and being used to impose austerity and curb the growth of public spending and deficits
- It might also structurally weaken the Euro relative to the ZAR
- Although Rand depreciation from time to time is to be expected in times when the global financial market goes 'risk-off'
- The consequences for SA will depend a lot on how the EU resolves this crisis: on whether stimulation or austerity becomes the main driver and whether the currency union is torn apart.
- The problem will take a long time to be fully resolved and until then the risks will be reflected in the financial markets' reactions and volatility will be the norm as long as there is uncertainty.

<u>Growth & trade</u>

- All these factors work against SA for whom the Euro-zone is its largest trade partner
- Our exports are now both more expensive in Europe and less in demand
- One would expect less direct investment in SA by European investors
- And the tourism industry will suffer with fewer Europeans being able to afford travelling as a result of higher taxes and unemployment

- As European demand for ZA goods weakens this will result in a reduction of the export sectors of the ZA economy
- With knock-on effects (e.g. caused by job losses, lower wage growth etc.) that will trickle down into all sectors of the economy
- This will result in lower tax revenues and consequently higher budget deficits and Gov. borrowing requirements.
- ... unless new markets (such as China) can be found to compensate for the lost demand

<u>Commodity prices</u>

- Weaker demand for commodities, both from the EU and from countries who supply manufactured goods to the EU, will depress commodity prices.
- This has a direct and very negative impact on the earnings of SA commodity exporters

- Unless demand from emerging markets remains strong enough - in spite of their own lower export demand to the Euro-zone - to support commodity prices
- The one exception is gold – the continuing uncertainty caused by the crisis in the EU enhances the demand for gold as a hedge against catastrophe

Currency
- All the above will act to keep the ZAR weak relative to countries with higher growth including many of the BRICS countries and commodity exporters

Interest rates & Inflation
- The influence of EU conditions will tend to create an environment conducive to low inflation in SA: strong ZAR, low growth, subdued demand
- But SA has internal pressures that are forcing inflation up: increases in administered prices, wages, government spending etc.
- At the same time Reserve Bank policy will be more concerned with lack of growth so it will be reluctant to invoke higher interest rates

[Candidates can also argue for different scenarios provided they are logically motivated.]

ii. Impact on ZA markets

Equities
There will be pressure on earnings as a result of
- Less export demand, from EU (one of ZA's biggest trading partners)
    - and even places like China if they see demand for their goods falling off
- low growth in general (see above)
- but SA companies currently have healthy balance sheets and large cash stockpiles available for corporate action or dividend distribution

The effect could be more pronounced in certain sectors:
- directly affected would be companies that export to the EU
- but lower growth worldwide could mean all exporters experience lower demand
- the secondary effect of lower growth for local companies could see earnings under pressure across a wide range of sectors
- But if Rand strengthens for prolonged period, importers could benefit

There could also be a de-rating of sectors or the market as a whole if investors believe that the earnings are unpredictable or unsustainable
Conversely, if inflation is brought under control, SARB might be able to cut rates once more, thereby stimulating domestic demand, which is positive for equities
Equity markets will be more volatile as investors move between "risk-on" and "risk-off" trade given uncertainty; local shares may be sold as investors sell emerging market shares which are perceived to be more risky

Bonds
- Low interest rates in Europe will drive the search for yield which would make ZA bonds attractive
- High liquidity in SA currency and bond markets makes SA popular with investors looking to obtain emerging market exposure
- This will help restrain SA bond yields and partially counteract the upward pressure from local drivers (such as supply of bonds increasing to fund higher budget deficits)
- But while nervousness remains there are likely to be spikes of risk aversion with foreigners abandoning ZA assets periodically only to return when risk aversion abates
- This would introduce more volatility into the markets

- This phenomenon is commonly also be seen in the equity market

<u>Inflation linked bonds</u>

- There is not much foreign demand for ILBs so local demand will largely determine their price
- To the extent that inflation is dampened (see above) the impact of the EU would be to lessen demand for ILBs
- But local drivers could still trump the deflationary influences from abroad and inflation would surprise on the upside

<u>Property</u>

- Low growth will put a damper on property rental growth
- The effect will be more muted than in equities but an increase in vacancies and arrears might be expected over time
- Development will slow down but buildings in the pipeline will come on stream an depress rentals

<u>Cash</u>

- Short-term rates likely to remain low as Gov. wants to stimulate growth
- Real rates will be squeezed if a stagflation scenario develops
- But even at current levels the real yields are much more attractive than those available in developed markets

b)

This was another question that produced disappointingly mediocre answers. Changing an asset allocation benchmark is not something to be done lightly. Candidates generally did not give this principle enough weight. Nor did they typically indicate that they had considered the complications of changing the asset allocation benchmark in the situation described - where the assumption of a structural change in markets would, by definition, negate any history on which to base ALM assumptions going forward.

i)

The AA benchmark is intended to guide the fund's investment policy over long periods of time.
It is the default position for when the asset manager(s) do not wish to take active AA positions

- and hence will be the major driver of investment performance.

Usually it will be derived from some sort of optimisation process that considers

- The expected level of returns per asset class
- The expected volatility of returns per asset class
- The correlation of returns between asset classes

These parameters are usually largely a function of past observed values.

This optimisation should be done relative to the scheme's liabilities i.e. the likelihood of meeting the benefit payments when required - taking into account funding issues, age profile, demographic considerations etc.
And will incorporate the willingness to take on risk in return for higher returns
So the AA benchmark should aim to maximise the scheme's likelihood of meeting its specific investment objectives.

ii)

Asset managers are usually given some leeway to express an AA view by changing the weightings of the asset classes to some extent.
If the economic and market changes are such that the trustees feel the asset manager(s) can be expected to adjust their investments to accommodate the changes, it may be unnecessary to alter the AA benchmark.
However, asset managers are often incentivised to manage close to the benchmark and may have no inclination to move too far from it regardless of their market view.

If AA is static, possibly with automatic rebalancing, then the fund will be even more susceptible to changes in the long-term performance of asset classes.

If there is reason to believe that there have been such fundamental changes to economic conditions that past experience is unlikely to be repeated in future, then the AA benchmark should be revisited.
It is important to remember that temporary changes in experience do not necessarily invalidate the assumptions – one requires a secular shift in fundamentals to justify changing the AA.
In this instance one might consider, for example:

- Whether past equity returns are sustainable in an era when credit is shrinking rather than growing as it did over the past decade
- Whether low interest rates will be a permanent feature of the medium to long term future
- Whether the correlation of various asset classes have shifted permanently, particularly between foreign and local asset classes

The availability now of new asset classes that were not considered previously would be a strong reason to review the benchmark

Will need to consider on what one will base the new AA
Insufficient "new era" data for statistical optimisation
May be necessary to use less robust approximations based on fewer and more recent observations for informed predictions
This will give one less confidence in making radical changes and may result in compromise positions being adopted
In these uncertain times, experienced human judgement would be required as a check against outputs from quantitative models

Very important to consider the liabilities (age profile of membership, funding level, etc) in order to maintain an appropriate risk profile
This could well have changed since the benchmark was set many years ago
It might be instructive to learn from what are other schemes doing

c)

This question, perhaps because it carried few marks, seems to have been given scant attention by candidates who consequently scored poorly. This is a pity since it offered easy marks for those who could make practical suggestions – which should have been within the reach of every candidate.

Even if a full scale optimisation is impossible certain changes might be considered purely based on current best practice and reasoning from first principles

The foreign bond exposure looks unhelpful

- It will be dominated by US, Japanese debt
- Low yields make it just a currency play with more risk than reward
- From current levels of interest rates even a tactical exposure has limited upside
- Although a case can be made for opportunities to invest in credit

Consider including ILBs as an asset class

- For better diversification
- As a hedge against unanticipated inflation
- Although timing may not be ideal right now

Consider introducing direct (or possibly listed) property as an asset class

- For better diversification
- To diversify real assets while dampening the volatility
- For property in some areas, rentals may be stable and inflation-beating, in line with the return target for portfolio

Does it make sense to have a strategic allocation to cash at as high as 5%, unless there are Immediate liquidity needs?

Is the Fund happy with only a 15% offshore exposure, when the current limit is 25%, plus an additional 5% if directed to the rest of Africa? It is possible this exposure not been revisited since the SARB relaxed the limits

What about allocations to SRI and private equity investments? In theory, given a long time horizon (this being a DB fund), the return potential should be higher (at least from the illiquidity premium), plus less correlation with equity markets

Performance benchmarks

The performance benchmarks may be encouraging unhelpful behaviour

- MSCI World covers only developed markets and so asset managers may be disinclined to give much weight to emerging markets
- A move to MSCI All Country World index, which includes emerging markets, might be considered in order to capture their superior growth
- The Morgan Stanley GBI Index looks erroneous – it should probably refer to the JP Morgan GBI – but should ask if an index of government bonds is appropriate
- includes government bonds only
- The FTSE-JSE All Share index has great concentration in the biggest stocks many of which are resources related and susceptible to the lower Euro-zone growth
- A capped index such as SWIX would give better diversification
- The ALBI may be too easy to beat depending on what credit exposures are allowed
-

Question 3

This question was very poorly answered. It was undoubtedly a more difficult question but candidates compound their problems by not tackling it systematically. This is, after all, just a question about how assets and liabilities change in a low interest rate environment. Discussing all four products mentioned is, one would have thought, the most basic requirement – yet, surprisingly, some candidates glossed over one or more.

To fully explain the consequences of the scenario described consideration of both the existing book and new business for each product line is required. This alone would have been the basis for a reasonable answer. The more astute candidates might think to consider real yields and not just nominal. That in turn might lead them to consider the less obvious issue of expenses.

Term insurance

- Reserves usually small for term insurance so the impact at company level is likely to be limited
- The effect will depend on what assets are used to back this reserve
- Usually backed by fixed interest assets and the accuracy of matching would determine the extent of profits/losses as nominal interest rates decline
- If there is much whole life, which is often impossible to duration match, would expect losses as rates fall

- The product pricing for new business will have to allow for lower rates of investment return
  - This will make the product more expensive
  - Competitive pressures may make life companies slow to acknowledge the low interest environment – but this will cause losses down the line

- Expenses tend to be a major feature of this business so real yields and expense inflation assumptions are a major issue
- If real yields changed from 2.5% (e.g.) to 0% or negative territory the insurer could incur losses as these changes become reflected in the valuation basis
- The effect of inflation is particularly marked for whole life policies given the period for which expenses must be projected
- The quantum will depend on any mitigation using premium indexation or matching with inflation linked bonds

<u>Immediate annuities</u>

Assets are usually invested to match liabilities as closely as possible

- This is usually in a mix of long duration bonds and cash and swaps
- To the extent that there is adequate matching on the existing book, the effect of falling interest rates should be minor with increases in the value of liabilities matched by similar movements for the assets
- But the very long durations cannot be matched – the "tail risk"
- While rates are falling this duration mismatch causes a loss - because the liabilities, having longer duration, will increase faster than asset values
- And reinvestment will become an ever greater problem as only very low rates will be achievable as existing assets mature

New business will have to price in lower interest rates

- For voluntary annuities this will make the product very unattractive leading to lower volumes of business
- Again life offices will face the dilemma of when to start pricing in lower rates: too soon and they will lose business; too late and the business will be unprofitable

<u>Guaranteed deferred annuity options</u>

- Like most guarantees these will be valued using PGN110 methodology The PGN110 reserves will increase substantially as interest rates fall and the decline is reflected in ESG scenarios
- Matching of assets backing PGN110 reserves is a mitigating option but the terms are long and matching assets may be unavailable

- The insurer may well be committed to a balanced fund approach in the build up to maturity in which case it might not have many options for mitigating the interest rate effects

- Pricing of new guaranteed deferred annuity options will be very expensive per rand of monthly income because of low long term yields
  - It is likely that clients would place little value on these options in a very low interest rate environment and so they would be less likely to be added to products
  - How to make products attractive when long rates are just 2%? This line of business may cease to be viable

<u>With profit annuity</u>

Again the impact depends on what assets are backing the liabilities

- Usually a split between equity (for real growth and hence bonus declarations) and fixed interest
- Same fixed interest effect as above
- But once rates are structurally low, the product loses the underpin its returns get from high running yields

- This makes it more susceptible to the volatility of the real assets like equities
- Bonuses will have to become very conservative to the extent that they are affordable at all
- But annuitants' reasonable benefit expectations might not be met
- Different strategies can be adopted such as increasing the exposure to index linked bonds to provide guaranteed growth and stability
- But it is highly likely that real yields would also fall close to zero in the projected scenario
- A dynamic hedging strategy should mitigate the effects to a large extent

This would apply to the existing book, which can be re-engineered, as well as new business

Relevant points not in the solution will also earn marks.

Question 4

Answers to this question were of two types: adequate or abysmal. This pattern often occurs with the last question of an examination and may indicate candidates running out of time. It cannot be stressed enough that every question should be given due attention if candidates wish to maximise their chances of passing the examination.

The question required candidates to consider a situation that is probably very unfamiliar to them. Those that came to grips with the issues involved gave credible answers. Those who gave up or failed to analyse the problem effectively scored very poorly.

(i)

- The proposed solutions would all ameliorate the problem of low returns (to differing degrees)
- This would increase returns to clients and/or the company
- And could attract business away from other brokerages further increasing profits and the strength of the business

- But there will be an essential mismatch of asset and liabilities involved
- Money market funds invest in instruments with short duration which is a good match for the liabilities which are funds which must be paid at face value on demand
- Higher yielding fixed interest assets are either longer duration (treasuries) or come with higher risk (corporate debt)
  - or have liquidity and marked-to-market valuation problems
- All these risks are borne by brokerage as the liability for ABC is cash which can be demanded by its clients at no notice

Need to determine the actual duration of the liability i.e. as experienced by ABC

- Type of client (retail vs. institutional) and how much cash these types typically keep idle in their brokerage accounts
- Swings in institutional accounts would be larger and put US Co at more risk of not having liquidity
- Private client funds might be more "sticky" and less "lumpy"
- But retail investors may act simultaneously upon major news events
- Investing in longer dated treasuries exposes ABC to duration mismatch
- How much duration mismatch can ABC handle?
  - o What is the likelihood of all clients demanding access to their cash at once? In the past what is the most cash clients have drawn down on at any one time? Would need to model a worst case scenario, what would this look like?
- How would ABC cope in a run-on- the-bank scenario?
  - o Liquidity – must balance the need to have enough cash for client withdrawals & investment in securities vs. holding less liquid assets with higher yields
  - o In worst case scenario would need access to finance to honour guarantee to client

  - Might need to develop lines of credit with banks to facilitate liquidity needs when these exceed expectations. This could well take place at a time of crisis when banks are not keen to lend

Might be some guaranteed interest rate offered on the cash per contract

- Likely to be low at present

Consider the governance situation

- does regulation allow this?
- does contract with client allow this?
- what was advertised or disclosed to client?
- client reasonable expectations: clients would assume that their cash is in fact "cash" and safe and liquid.
  - If they wanted to invest in securities they would have bought them within their own brokerage accounts. They do not want to take credit risk with their cash

Consider credit risk management:

- corporate debt come with credit risk so ABC takes on the credit risk of a default
- would need to establish limits on what instruments can be invested in
- would the risk be managed e.g. by limits on credit rating

Risks associated with MBS:

- Holders of MBS are exposed to pre-payment risk
- Mortgage holders are allowed to pre-repay mortgage
- This means there is uncertainty with regard to the duration of the MBS: if interest rates rise, pre-payments on MBS will slow and duration will increase
- This might take place at same time as investors switch from cash to equities (higher rates due to economy picking up) exacerbating duration mismatch and liquidity problem
- Similarly if rates fall further, pre-payments increase and then one sits with pile of cash that needs to be invested at even lower rates
- Credit quality (how to evaluate credit quality of MBS)
- Can one rely on credit agencies?

Relevant points not in the solution will also earn marks