

# EXAMINATION

April 2008

## Investment Specialist Applications

# EXAMINERS' REPORT

### Introduction

The attached subject report has been written by the Principal Examiner with the aim of helping candidates. The questions and comments are based around Core Reading as the interpretation of the syllabus to which the examiners are working. They have however given credit for any alternative approach or interpretation which they consider to be reasonable

### Comments

The solutions contained in this document are more detailed than what would typically be required for a clear pass. Any relevant points made by candidates were given full marks, even if they are not contained in the solutions presented below. Further comments are given in the solutions presented below.

## **QUESTION 1**

*This question examined the candidate's knowledge of credit risk and how it can be managed in RSA and her ability to apply this knowledge to analyse novel, derivative instruments. The context of a specific type of portfolio with its implied objectives and constraints was also an important consideration.*

*The first part was relatively straightforward and required knowledge of credit opportunities in the local market. Covering all, or at least most, of the opportunities was key to doing well in this section.*

- (i) Introducing credit risk from any of these domestic sources will enhance returns:
- Quasi governmental (parastatal) debt issues
    - o In past had gov. guarantees; less so for new issues
    - o Normally highly rated  $\Rightarrow$  not much yield pick-up
    - o Liquidity can be good in some issues
  - Municipal debt
    - o High yields possible
    - o Issues with reporting (e.g. not IFRS compliant) make credit assessment difficult
    - o Where finances are more transparent, have achieved significant yield compression
    - o Issue sizes tend to be small
  - Corporate debt issues
    - o Bank issues
      - Lots of debt issued
      - Good ratings  $\Rightarrow$  small yield pick-up
      - Would typically have exposure to banks in cash portion anyway
      - International banks sometimes issue ZAR debt into the local market
    - o Other corporate debt issues
      - Several dozen names have issued
      - Typically companies with better ratings (like AA-)
      - Small quantum per issue, so poor liquidity
      - Need to purchase at issue to build a portfolio and then hold to maturity as often expensive to sell
  - Asset backed securities
    - o Numerous issues backed by mortgages, credit card debt etc.
    - o Each issue rated and ratings are investment grade
  - Mezzanine finance
    - o Often issued to finance specific projects
    - o Operates in the area between equity and debt
    - o Higher risk profile than most ordinary debt  $\Rightarrow$  much better expected returns
  - Credit derivatives
    - o Credit default swaps are available and a market is being set up to trade these (initially for ALSA140 companies)

- Instruments with yields enhanced by credit risks are packaged and sold by merchant banks e.g. credit default notes

Mention of current quantum of spreads is relevant

Some transactions like repo's introduce credit risk as a by-product since there is exposure to the performance of the counterparty at settlement. But this is not a significant source of return.

Portfolio considerations:

- Opportunities will depend on current portfolio structure and mandate constraints
  - The mandate will almost certainly limit exposure to investment grade paper
- Most of the credit instruments have a tenor of less than 5 years and so have limited use for duration matching
- The long duration of some liabilities allows a buy and hold strategy; liquidity less of an issue
- Active trading of credit opportunities (e.g. when spreads widen or narrow in the different categories, or switching between names) can enhance returns

The portfolio could also source credit exposures in foreign investments:

- Credit as an asset class is much more highly developed overseas; markets are much more liquid
- Many large issues of asset-backed securities are available in the US
- This introduces currency risks unless hedged out

*In this section the application of basic portfolio risk management constraints as well as risk budgeting techniques was required.*

- (ii) A risk budget should be established and the individual credit exposures managed within this budget.

Exposures can be measured as nominal amount invested. In this case exposure to lower rated credits must use more of the budget than higher rated credits. The ratio might be informed by international default rates.

Alternatively a VaR approach could be adopted using probability of loss multiplied by loss given default. The total VaR budget can then be spread over the VaR contributed per holding.

Note that the South African default experience does not generate nearly enough data to analyse default rates or loss given default. Consequently must extrapolate from overseas data.

Specific constraints might be imposed such as:

- Limit the credit rating of instruments to investment grade to ensure minimum quality of portfolio
- Limit the accumulated exposure to individual credit names to ensure diversification of risk

- This can vary by credit band so that limits for riskier credits are stricter than for less risky credits
- Limit the exposure per credit band (e.g. no more than 5% in BBB) to ensure that riskier credits don't dominate the portfolio
- Credit derivatives (e.g. credit default swaps) can be used to lay off or take on credit risk within the risk budget and constraints
- But since these are often issued as OTC instruments, there will be an additional credit exposure impact

*This section tested the ability to analyse a credit-based instrument. Again the portfolio context must be interrogated in addition to issues relevant to the instrument itself.*

iii) Specific to the instrument:

- Note the purchaser is exposed to both credits so must consider creditworthiness of both the bank and the reference entity
- Rating of the reference entity – to determine it is of sufficient quality in terms of mandate constraints
  - Internal view of prospects for the company since this may be more or less favourable than that of the ratings agency
- Rating of the bank – a major bank will have a rating of at least AA- so shouldn't be a problem.
- Tax treatment of the instrument
- Is the risk sufficiently rewarded by the yield uplift
  - This presupposes the ability to price the risk which is problematic since:
    - Difficult to model given the lack of default data
    - Few comparable instruments in the market;
    - So buyer should price with conservative assumptions to allow a margin for safety
  - How does return compare to conventional sources of yield pick-up like corporate bond yields?
- Secondary market tradability (almost certainly very limited)
  - If limited, appetite to take 5 year view on this credit
- Legal risk: is the documentation comprehensive, unambiguous and properly prepared by experts
  - E.g. definition of what constitutes a “credit event”

Relative to the portfolio:

- Does it fall within the mandate
  - E.g. does the mandate allow investment in derivatives (since this contains an embedded credit derivative)
- Can it be accommodated in the credit risk budget
  - Existing exposures to similarly rated instruments
  - Current exposure in the portfolio to the reference entity

- Current exposure in the portfolio to the bank
- Will any other limit be breached
- Can this replace another less attractively priced
- Ability to diversify
  - Since outcome is binary (pays all or nothing) and it is difficult to be certain there will be no default, would be prudent to diversify the risk over a number of companies
  - This will provide greater predictability of the outcome
- Would this use up the credit risk budget and crowd out other, more suitable, credit opportunities
- Does it suit the duration profile
  - Since payment is all at the end, the duration of the note is 5 years which might be long enough to be attractive for matching purposes.

*Similar to part (iii), but here it was expected that candidates would also examine the implications of the severe asymmetry of the payoff profile and the attendant risks that this introduces. The addition of part (b) should have drawn additional attention to this aspect.*

- (iv)
- The notes are interest bearing, so superficially they are well suited to an immediate annuity investment portfolio.
  - The fact that they are short-term is not a problem; many portfolios invest in cash deposits and use swaps to create the desired (better matching) term profile.
  - In such a scenario achieving a yield greater than JIBAR is highly desirable
  - Even for the (much smaller) cash portion of a traditional fixed interest portfolio such an increased yield would be worthwhile (assuming nothing goes wrong)
  - But the notes introduce equity risk which this portfolio does not currently have
    - Despite the name – they are perhaps more accurately called Equity Default Notes – they have less to do with credit risk (i.e. failure or inability to pay agreed financial obligations) than with equity market risk (i.e. the movement of share prices)
    - Such investments may be excluded by the mandate, and even if this instrument is interpreted as “fixed-interest” it may be contrary to the intention of the mandate
    - The equity market risk introduces a new element of mismatching to the portfolio
    - Inclusion of the notes may result in higher capital requirements for the underwriter and have implications for cost of CAR
  - There is both market risk and specific risk
    - A share could experience a fall due to factors unique to that share
    - Or the entire basket could be affected by a general fall in the market
    - There is some diversification due to the basket of 10 shares, but their price movements are not independent and beta risk remains
    - Resources stocks dominate the Top 40, so there could be additional systematic industry risk factors (exposure to commodity prices, rand exchange rate)

- This specific risk could be diminished by choosing the shares expected to be the least volatile or considered the most undervalued, though this will certainly affect the additional yield offered
- Similarly could increase the number of shares in the basket
- The credit exposure to the issuing bank must also be acceptable to the portfolio
- In addition the payoff profile is unfavourably asymmetric: could lose everything on the downside but capped on the upside
- In effect the portfolio would be selling protection against extreme market risk to the bank
- In order to assess the probability of the prices falling more than 50% during a 6-month period would need to consider:
  - Historical price movements and the incidence of trigger events
  - Current cheapness or dearness of the market and the individual shares
- The big problem with the former is that we are dealing with extreme events with a low probability, so the empirical observations may be very poor predictors of future frequency of such events
- Option pricing methodologies can be used to determine the value of an American option written at 50% of the current share price and compare this with the excess income earned to determine whether the risk is adequately rewarded
- However the assumptions in the option pricing methodology can produce very unrealistic results so far out of the money; the assumptions like normality are adequate when pricing close to spot but are not defensible in the tails
- Any one breach causes a 10% loss of value. This will not be recouped by the income, so a single event will result in loss of capital
- Ultimately the portfolio manager must decide whether the range of outcomes is acceptable including those that result in (possibly total) capital losses
- In the absence of a convincing rationale for risking those losses, any investment would amount to speculation which will almost certainly not be permitted by the mandate.
- The funding position would affect the appetite for risk and hence for this type of instrument

If the trigger is at 70% price fall:

- The trigger events are even less likely – in fact have never occurred for any ALS140 share on the JSE
- The yield uplift, though now considerably less, therefore seems more appealing since probability of capital losses is much lower.
- But the problems of pricing the risk are now even more acute since we are modeling the very far tails of the distribution without the benefit of any empirical data.
- the risks may appear much more bearable but argument against seeking speculative returns remains.

*This section tested a general knowledge of the investment needs and risk motivations of various players in the market.*

- (v) In both cases, though more likely for CRN's, the bank may be acting as a middleman and matching buyers and sellers for a profit.

They identify a need, design and package product to meet it, and then hedge out the residual risks on their books

In the case of the CDN's:

- The bank may have credit exposure to the company that forms the reference entity that it wishes to diminish.
  - o This could be a line of revolving credit or specific term financing that exceeds internal limits
  - o Rather than involve other banks in syndicating the loans, the bank would prefer to "own" the client (be the sole provider) and lay off some of the risk in the market
  - o It is possible the bank is aware of problems in the reference entity that are not in the public domain and hence is eager to offload its exposure

In the case of CRN's:

- The bank may have positions in the shares that it wishes to hedge against extreme market movement.
  - o The positions may arise through proprietary trading activities, warehousing as part of a deal, etc.
- The bank may be a writer of single share or index options and can offset some of its risk positions by passing the risk on to other parties at the cost of the additional yield.

## **QUESTION 2**

- (i) The valuations of different asset classes should play a role, that is, inexpensive assets should have lower downside risk.

But in the short term cheap can become cheaper.

Over longer periods presently cheap assets tend to produce the better returns. So answer does depend on the time horizon. Must weigh up short-term concerns against long-term objectives.

E.g. for CAR/Disclosed EV reasons may want to protect over financial reporting end periods.

But over time have to be able to declare competitive bonus rates, so competitive returns are an issue.

need to consider expected (after tax) return on other asset classes and importantly the downside risk associated with each asset class

The optimal mix of asset classes is determined by correlations; reducing equities will result in greater concentrations in those classes that are most correlated (e.g. bonds, cash and property)

The selloff of equities could lead to crystallization of capital gains tax  
Transaction costs including market impact costs must be taken into account  
May not be possible to reinvest in other asset classes that are already at maximum mandate levels  
Considering the asset classes in turn:

Cash:

Negligible downside risk but low expected return  
Opportunity cost associated with holding cash  
Tax issues

Unlisted property:

Downside risk depends on company's approach to valuation.  
Most companies value using stable long term assumptions, so returns are effectively smoothed; which implies little downside risk. (Nowadays less true due to IFRS but the smoothing effect is still present.)  
Should produce higher returns than cash over time, but depends on current valuation.  
Tax issues: mixture of income and capital gain.  
May not have sufficient volumes available. Not easy to buy and sell each time you change TAA.  
Relative to bonds can obtain roughly same initial yields and get potential upside

Bonds:

Returns may be higher or lower than cash depending on current valuation  
Downside risk higher than for cash and unlisted property  
Risk is that if see downward adjustment in equities may well see the same on bonds given influence of foreign investors in SA market and correlation between different markets.  
Tax issues: mainly income but some gains.

Foreign assets:

Could already be at your limit of 15%

Equities:

Markets tend to be highly correlated, so downside adjustment to SA equities may well be on back of adjustment in International markets.  
In addition have to contend with currency risk.  
Are valuations cheap/expensive?

Cash:

Lower hard currency returns.

May or may not be augmented by currency gains.

But higher downside risks than SA cash given currency risk.

Bonds:

Similar comments as for cash

In addition downside risk associated with bonds

*This section examined understanding of the use of derivatives as a tactical asset allocation tool.*

(ii) Hedge part/all of the local equity exposure

This involves a cost - either directly by paying for a put/put spread.

Or indirectly by incurring an opportunity cost if write out of the money calls to pay for put/put spread.

Arguably if market is currently inexpensive there is a greater chance that this will be a real cost (as opposed to being a benefit).

May be difficult to find an instrument for hedging with low tracking error relative to actual equity exposure.

Given that options market mostly European (rather than American) the hedge likely to be less sensitive than the underlying you're trying to hedge because of optionality.

Term of the hedge is very important in terms of price, sensitivity and view

Which means only really effective at maturity date, which may not coincide with reporting period end.

There could be slippage due to implementation of delta in market.

Price of buying puts > price of selling calls because of volatility skew so pricing works against this strategy (i.e. buying expensive puts, selling cheap calls)

As an alternative short futures against the long equity exposure creating synthetic cash

Tracking error may be an issue

Transaction costs are cheaper in the derivatives markets

Derivatives can avoid triggering CGT

*This section required a more sophisticated analysis of applying derivatives to hedge risk. To do well students needed to understand the trade-offs between the bought and sold options and how adjusting the strike levels would affect that and would be influenced by the market view.*

(iii) Definition of a zero cost strategy: simultaneous purchase and sale of derivatives in such a way that the total initial cost is zero

*Buy a put either at the money, or slightly out of the money, funding the cost of paying for the put by writing an out of the money call.*

This approach gives limited upside.  
But protects 100% of the downside.

So one would use it if one thinks there is lots of downside risk to the market and limited upside potential.

And if the cost in terms of one's competitive position (i.e. ability to declare competitive bonuses) of being wrong in one's view is limited. E.g. because you believe you are already better funded than the competition.

*As above but also write a put at a lower level than the one bought.*

This means that the call will be written at a higher level to make it zero cost, giving more upside potential

So one will use this approach if one thinks there is some, but limited, downside.

But also a risk that the market may still increase further.

One can play around with the extent of downside protection required, with the greater the downside protection purchased, the lower the level of the cap.

E.g. if you can afford to absorb some capital losses (because funding level is good) could buy the put at say 10 to 15% below spot. This will raise the cap considerably – useful if the AM thinks the market could still run

In general, the greater the time horizon used, the higher the cap for a given level of downside protection purchased

*This section required understanding of the possibilities and implications of unwinding a hedge position. It is an extension of the previous problem required systematic attention to both the portfolio implications and the practicalities of implementation.*

- (iv) The cap represents an effective short equity exposure.  
The problem of course is that the future path of the market is uncertain. Equities may continue increasing in value, so that competitive performance may suffer, or equities may fall in value which will mean that the cap will end out of the money, not impacting performance at all over the 3 month period to maturity.  
Equities may even fall back such that money is made out of the put structure.

Alternative approaches:

Buy back the call. This will turn a potential bigger loss into a certain loss now, impacting relative performance, but potentially by less than would be the case if the call is left to run to maturity

It does however remove the uncertainty associated with the potential impact on returns.

Increase equity exposure by buying more (physical) equities, to offset some/all of the short position.

The problem arises when the equities fall in value and your exposure is higher than it would otherwise have been.

Can try to manage actively i.e. buy basket of equities when goes up through the cap and sell when it goes down through the cap but this is difficult to achieve. It may also impact tax and result in high market impact costs as well as trading cost, e.g. brokerage.

Increase equities by going long futures when goes through the cap.

Problem: futures not an exact match for equity exposure.

Basis risk

Have same problem as above if equities go through the cap from above.

May be easier to sell and buy futures than basket of equities (above).

Need to hold cash for marking to market calls.

*This section required a basic understanding of the nature of various asset classes and their combination in portfolio construction. Marks were also gained for demonstrating an understanding of long-term and short-term portfolio considerations.*

*Subject SA4RSA (Health and Care Specialist Applications) – April 2008 – Examiners Report*

(v) It is true that we expect lower dollar returns on US equities.

But South African investors are interested in Rand returns.

So one's view on the Rand should also play a role

It is, of course, very difficult to know what the Rand/USD exchange rate will be over time, given the high (historical) volatility experienced by the currency.

So the reason we invest in what appears to be low yielding assets is because of the diversification benefits it brings to the portfolio... even if one has a strong Rand view

One should, however, consider whether one cannot find other, non-SA assets, which would provide higher expected dollar returns, whilst providing one with the same/similar diversification benefits. E.g. investing in European equities.

Due to exchange controls other complications are created by bringing back the money to SA.

Difficulty associated with taking it out again so important to take a long-term view. But the tail should not be allowed to wag the dog.

Tax considerations: acceleration of CGT payments; potential risk of losing long-term investor status.

There may be mandate restrictions that prevent reducing the reduction on foreign assets.

The fund must consider the benchmark risk and/or peer group risk implications of taking a stance contrary to the strategic asset allocation or general practice .

**END OF EXAMINERS' REPORT**