

**Actuarial Society of South Africa**

# **EXAMINATION**

May 2015

**Subject F205 — Investment**

**Specialist Applications**

## **EXAMINER'S REPORT**

*This paper was generally better written than the previous session – despite it being considered a trickier paper. Candidates who knew their bookwork and demonstrated their ability to use this knowledge in application and idea synthesis did well.*

*There is, however, a worrying trend that many candidates are clearly not adequately prepared for the exam. This was not only in terms of exam technique and base knowledge (book work) but also in the critical skill of higher order thinking.*

## QUESTION 1

*This question called on candidates to evaluate an unusual investment proposal. Many candidates did not make the clear distinction between what was being sought in section i and ii. Benefit of the doubt was generally awarded where points were well argued, but candidates are urged to carefully read the questions, taking cognizance of the mark allocation.*

*This was a clear opportunity to demonstrate a structured thinking ability – breaking up answers into sub themes. As always with relatively lengthy questions, weaker candidates tended to branch off on tangents, while stronger candidates focused on the crux of the answer. In this case, candidates who broke their answer down into themes and focused on the challenges presented by the workers' proposal did well.*

i)

One would need to determine an appropriate valuation method and gauge the need to consult relevant independent experts on aspects of the valuation:

Are there any directly comparable entities to use as indicators?

What is the expected life of the investment – including possible exit strategies (for instance any other strategic/financial buyers)

- DCF valuation is most appropriate

Because a mine is a finite life asset – once reserves are extracted the mine is shut

- For this reason, PE valuation may not be appropriate
- One needs to project future mine revenue, costs and capital expenditure requirements into the future and discount the emerging cashflows

Revenue issues

- What is the remaining life of the mine?
- How much coal will be produced in each year?
- Current Quality of reserves/resources
- How will the quality of reserves progress over time? Has the highest quality coal already been extracted?
- What are the expectations for the coal price - mines are price takers
  - Particularly given concerns over international growth prospects
  - And potential for South Africa's future energy generation strategies .e.g switch to green and nuclear
- Are there any existing long term supply agreements with customers and what are the terms of these agreements?

Are the terms agreements market related at current prices

## Cost

- What are current unit cost levels compared to industry benchmarks (per ton)
- What are the main contributors to costs (staff, diesel, electricity...)
- How are these expected to change over the lifetime of the mine
- If overall production is going to fall over time, one needs to factor in higher unit cost inflation as fixed costs are spread over lower production tons
- Overhead costs may be higher than before as ABC co likely handled HR/finance costs
- Will it become more and more difficult / expensive to extract the remaining reserves?
- What is the scope to cut costs?
  - Though given the nature of the proposal, large-scale lay-offs may not be acceptable
  - Given the nature of the deal, will workers be willing to take a pay cut or limit future increases
  - Or perhaps share in a part of the profits
- Costs of hiring management/outsourcing the management

## Capital Expenditure

- What additional capital expenditure is needed to access the remaining reserves?
- What is the strength of the balance sheet that the fund would be inheriting with the mine?
- Must take into account closure/rehabilitation costs at the end of the mine life
  - How must this be funded?
- How these capex requirements going to be funded?
- Will they require further equity injection needed
- Internally generated cash
- Or Debt issuance

## Discount rate

- What discount rate should be used to discount cash flows?
- Perhaps start with 10 year govt bond yield and add risk premium
- When modelling the cash flows the model should be stressed by testing a range of values for the key drivers of returns (coal price, wages, etc.).
- The more sensitive the model is the higher the risk premium that should be applied to a base case valuation.

## Tax and Legislation

- Are there tax allowances against this and past capex?
- Are there deferred tax losses that can be used to offset against future profits?
- Also any pending changes to mining regulation and legislation in SA which could affect the future of the mine
  - Particularly with regard to mineral and property rights

ii)

#### Merits of the investment

- One would need to explore the accuracy of the employees' claims that the mine's fortunes can be turned around under new management.
- Why is ABC co (a large company with presumably extensive mining skills) not able to make a profit from the mine?
- Is this not simply a ploy for workers to save their own jobs?
- Mines are price takers (coal is a pure commodity) which means that the strategies available are:
  - Either produce more coal or
  - Reduce costs
  - Are either of these possible and if so why has ABC co not done so?

#### The nature of the financial vehicle

- The nature of the financial vehicle would need to be considered. How will the mine be held?
- It certainly would need to be housed in a separate limited liability structure? A separate company.
- How would future capital requirements be dealt with? Will the fund set aside liquidity for this in future?

#### Fit with the fund

- Pension funds are usually passive investors owning minority stakes in listed companies
  - And have no experience in managing companies
  - Let alone a mine which has complicated engineering complexities
  - MMPF will probably not have the corporate governance expertise, skills and capacity to appoint a competent board and operational management team
  - Should the pension fund have appetite to develop it, what will it cost in time and money to install such expertise?
  - If MMPF buys the mine who is going to run it?
  - As current management cannot make a profit one assumes management will be replaced
- The fund trustees need to consider the extent of their mandate and fiduciary responsibility
  - While SRI considerations are likely to be very important for the members
  - Buying a non-viable and unprofitable asset to save members' jobs may be irresponsible
  - The trustees have a fiduciary duty to ALL members of the fund and cannot put the interests of a few members ahead of others

- The size of the fund will play a role in the decision
  - If the fund is relatively small, the concentration risk of owning a single mine may be too high
  - If the fund is very large with a diversified portfolio of investments, an investment in a single mine may not present a significant concentration risk
  - Though in this case, it would be questionable whether the level of attention it would require could be justified
  - What impact would it have on the liquidity of the fund – given that it is not a tradable investment
  - Does it comply with the maximums of Reg 28?
  
- Assuming that the fund is large enough and the mine can be purchased with an acceptable forecast IRR, how will the mine's inclusion affect the MMPF's existing portfolio of assets?
  - What is the fund's current allocation to resource shares?
  - How will the inclusion change the exposure to investment drivers like currency, commodity prices etc.?
  - How will the inclusion of the mine affect the overall volatility of fund returns?
  - How would it be valued regularly?
  - One would want the MMPF not to have an excessive allocation to mining securities.
  - MMPF members are mineworkers whose livelihoods are already closely linked to mining companies' profitability. Linking a significant portion of their pension fund to miners may not be prudent

## QUESTION 2

i)

*This bookwork question was answered relatively poorly. The focus was on the economic function, as opposed to investment characteristics and uses.*

- Commodity futures are predominantly used for risk mitigation
  - commodity producers who wish to reduce uncertainty in the future cash flows that they will receive for their product
  - they will enter into short positions in order to secure a price at which to sell a product in the future
  - commodity consumers who wish to reduce the uncertainty in the amount they will have to pay for their future supplies.
  - they will enter into long positions in order to secure a price at which to buy the product in the future
- Generally consumers are regarded as less willing to commit to a future purchase than sellers resulting in a “hedging risk discount” built into the futures price
- Such users of commodity futures may not deliver, or take delivery of, the physical commodity.
  - They may, for example, be using the contracts to hedge (even if partially) against the movement in price of a related product e.g. a product of a different grade to that specified in the futures contract.

ii)

*This bookwork question was also answered surprisingly poorly. Many were aware of the terminology but not of the mechanics of these scenarios.*

- Contango is the situation where the futures price of a commodity is above the expected future spot price.
  - In practice the term may be used to refer to "negative basis" where the current spot price is below the future price.
  - It is an upward sloping futures curve - The price of contracts with nearer maturity dates will be lower than for later maturities
  - Contango refers to a situation where people are willing to pay more for a commodity at some point in the future than the actual expected price of the commodity
  - This is the most common market situation where the underlying has a well traded investment market
  - This may be due to people's desire to pay a premium to have the commodity in the future rather than paying the carry costs of buying the commodity today
  - Contango may occur due to a glut in the current supply of the underlying commodity

- Backwardation is the opposite of contango.
  - It occurs when the price of a futures contract is below the expected future spot price
  - In practice, the expected future spot price is unknown, and the term "backwardation" may be used to refer to "positive basis", which occurs when the current spot price exceeds the price of the future.
  - It is a downward sloping futures curve - The price of contracts with nearer maturity dates will be higher than for later maturities
  - Because the futures price must converge with the spot price as expiration draws near, backwardation implies that the futures price must rise over time.
  - In this scenario, holders of the physical asset (as opposed to the future) could be willing to pay a convenience yield to shield against, inter alia, future shortages of the commodity
  - In order for Backwardation to occur, the convenience yield would need to be greater than the sum of cost of carry and financing costs.
    - This can be due to the lack of a widely traded investment market for a commodity
  - Backwardation may occur due to an acute current shortage of supply of the underlying commodity

iii)

*This question required application of knowledge to a specific situation and was answered somewhat better. Surprisingly, many who had a hard time with the previous bookwork question found it easier to apply those concepts to a real world scenario.*

Tom's idea of going long futures avoids him having to buy physical units of X and having to finance it, find a secure place to store it and insure it

- However this convenience will likely be fully priced into the futures price (given that it is in contango)
- Holding the contract in the case where prices do not rise will mean that the delivery price will reduce to converge with the constant spot price. This will cause his long position to have regular mark-to-market losses.
- A spot price that reduces will only exacerbate this loss. The downside could be significant.
- Rolling would mean selling the contracts prior to expiry and simultaneously going long new 6-month futures contracts
  - The market is in contango which means that the futures curve is upward sloping
  - In the scenario where prices stay constant, an upward sloping futures curve means that regular rolling of contracts will mean repeatedly buying high and selling low which will also cause losses.
- In order for this to be successful, the spot price would have to increase by an amount at least equal to the drag on profitability mentioned here.

iv)

- **Buy longer dated futures contracts (e.g. 2 year future)**
  - This way Tom would avoid having to roll the futures contracts every 6 months which may be costly
  - However, as the futures curve is in contango, longer dated futures contracts are more expensive (higher price)
  - Hence the profit potential from a rise in the price of X is diminished
  
- **Buy commodity X producing companies**
  - Share price of producers not always positively correlated to price of commodity they produce
  - The share prices of producers of X may already discount higher future prices
  - This strategy may be a more risky one
  - Fall in price of X is likely to reduce producer profitability
  - Producers with weak balance sheets may not be able to weather low prices go bankrupt before price of X rises or
  - Require capital injection (like rights issues)
  - However buying marginal producers (high cost producers) may be a more profitable strategy if prices rise as these producers' profits are more geared to higher prices
  - And there are a lot of other factors that determine a company's valuation e.g. quality of management, ability to manage costs down, current cost structure etc
  
- **Buy physically-backed commodity ETFs**
  - Might not be such an ETF for commodity X
  - Investors will pay (indirectly) for storage costs and insurance so
  - One would need to consider fees charged by management company offering the ETF and its TER

*Bonus marks will be considered for any reasonable structure proposed.*

### QUESTION 3

i)

*This bookwork question had a mixed response and showed that many candidates (particularly weaker ones) had little detailed knowledge of market dynamics.*

Qualifying bonds

- Only conventional listed vanilla bonds, with a fixed, even if zero, semi-annual coupon.

Composition

- Top 20 bonds in the marked ranked dually by liquidity (turnover) and market capitalization
- Dominated by government bonds
- Bonds less than 1 year are excluded
- Reconstituted quarterly by an advisory committee
- The index is weighted by nominal amount in issue of each bond, subject to some issuer cappings
- Reweighted monthly

Index types published

- Clean price index

weighted index of the capital value of the portfolio excluding accrued interest

- Interest yield index -

Provides a running yield estimate and is defined as the annual interest yield on the price index

- Total return index

measures the total return of the index assuming all cashflows are immediately invested in the index.

Sub-indices

- ALBI20G or GOVI – Top 10 Government issued constituents that form part of the ALBI20
- ALBI20I or OTHI – contains all ALBI20 constituents that are not GOVI
- Sub-indices calculated for each of 1-3yr, 3-7yr, 7-12yr and 12+yr) periods

ii)

The issue centers on whether an active manager can outperform the index after fees with a similar level of risk.

- Specifically credit and liquidity risk
  - And provide similar options for matching of duration / interest rate risk
  - Given the composition of the benchmark taking on some (diversified) credit risk makes it very easy to outperform the benchmark
  - SA bond managers by and large easily beat the ALBI

#### Objectives of the umbrella scheme and investors

- Umbrella schemes will be targeting matching of post retirement vehicles with bond funds
- Fund will need to be regulation 28 compliant
- Which limits holdings in non government issuers

#### The merits of active bond funds

- Evidence to suggest that active bond funds introduce a lower volatility
- As well as better downside protection
- Though this could be due to the bias for mega-cap companies in South African bond indices
- Which in turn could be passively replicated
- Passive managers could be inclined to take larger positions with issuers who issue larger amounts of debt relative to their balance sheet – which would increase credit risk
- Managers can look for opportunities to improve returns by exploiting other instruments such as credit, swaps, repos etc.
- A passive approach would limit capacity to introduce credit or diversify due to the composition of the index
- Given this, there is a limited universe of passive bond funds available in South Africa
- Allows taking duration bets to enhance returns
- Allows structuring portfolio duration to better suit liabilities than the index duration (which changes over time and may not be ideal)

#### The merits of passive funds

- Passive funds are significantly cheaper given (in part) the lack of need for detailed research
- Difficult to assess whether active manager outperformance is simply due to increased credit and liquidity risk relative to the index
- Relatively concentrated bond market means that it will be difficult to take positions too far away from the index in terms of credit exposure
- ... although meaningful duration variances are possible
- Particularly with regard to compliance with Regulation 28 compliance (which will be required)

## QUESTION 4

*This application question tested whether candidates could detangle the challenges presented by a corporate yield curve. Principally, the challenges centered on separating out yields of instruments with different ratings. Many candidates failed to see this and did not score well. Strong candidates made sure the focus of the answer were on the challenges as opposed to a treatise on developing yield curves.*

- A yield curve should show the yield to maturity of bonds of varying maturities but with similar risk ratings – based on rating agency ratings
- Corporate bond yields introduce differing levels of risk that a risk-free yield curve would not need to deal with – specifically default and liquidity risk
  - Government bonds would generally be regarded as risk free and liquid
- In constructing a corporate bond yield curve one has to decide how to determine the size of these 2 risks' contribution to the difference between the corporate and government bond yield curve (the credit spread).
  - Particularly given that bonds for a given maturity would represent a range of default and liquidity risk levels.
  - And hence differing risk premiums inherent in the rates
  - But determining the liquidity risk premium would almost be impossible given that some bonds are so illiquid and prices so stale ?

The number of bonds available and data availability

- the number of available government issues is high and dense with respect to time and maturity
- there may be a lack of corporate bonds for certain maturities - particularly long dated
- while most government bonds are listed on exchanges and data is freely available, collecting data for corporate bonds may be more difficult

Categorisation of risk

- For estimating the yield curve, companies should have a comparable risk class
- To isolate the impact of credit risk one may categorise the bonds by ratings according to one of the major rating companies such as Standard & Poor's or Moody's.
  - So a yield curve per category could be formulated
  - However, ratings for companies in different sectors are not comparable, so one also has to distinguish by the economic sector of a company, eg financial or resources.
  - But this will further exacerbate the issue of scarcity of data in particular ratings classes e.g. BBB rate companies
  - So a broader range of categorization could be used where each category spans a number of ratings
  - Or only produce a curve for ratings for which there is sufficient data
    - Which tend to be for highest rated debt

### Accuracy of pricing

- government bonds are liquid, resulting in an efficient market price finding mechanism
- many corporate bonds are not liquid and trade infrequently
- The bond prices usually are averages of dealer quotes. For bonds with a low liquidity, dealers might not update their quotes regularly because there is not much business to attract.
- This can result in prices that no longer reflect the market prices

### Special features

- most government bonds do not have any special provisions such as call features, making it possible to use only bonds without options for the estimation process
- some corporate bonds are callable and hence the “option to call” has to be priced

## QUESTION 5

*ESG is a softer issue but is very well covered in the notes. Candidates who were not well prepared focussed on watch words such as BEE and “Green” and did not score well. There are very strong arguments as to why these issues should be considered as integral to an investment process – in terms of evaluating and limiting the fundamental risk of that investment - and candidates who recognised these did well. Candidates who focussed on peripheral and sometimes ethereal concepts (and spend much time passionately arguing their case) did not score well. Again, it was also important to read the question carefully and answer accordingly.*

i)

- Regulation 28
  - This is regulation and therefore a legal requirement
  - Regulation 28 requires institutional investors to incorporate sustainability considerations, including ESG, into their investment analysis and investment activities

*“Before making an investment in and while invested in an asset consider any factor which may materially affect the sustainable long term performance of the asset including, but not limited to, those of an environmental, social and governance character”*

- The Code for Responsible Investing in SA (CRISA)
  - A voluntary code
  - requires asset managers that adopt it to publicly disclose their policies and methods of incorporating environmental, social and governance (ESG) factors into the investment process.

Responsibility as asset owners:

- As Universal Owners pension funds collectively own a share of the economy and are effectively tied into this share in the longer term.
  - The long-term financial interest of their investments depends on the ability of global markets to produce economic growth on a sustainable basis.
  - As a result, they infer that their actions should involve managing their longer term risk through asset allocations and active ownership practices that are sensitive to longer term ESG factors.
- There is a growing market awareness and impact on behaviour :
    - Which places pressure on the investment companies
    - And amongst members who in their own right are actors in the market

Better risk evaluation and potential for Improved risk adjusted returns

- Incorporating ESG factors into the investment process leads to a better understanding of the financial and non-financial risks a company faced.
  - And hence improve the risk characteristics of their portfolios
- Preserves Fund reputation by potentially avoiding and limiting exposure to failed assets
- As well as avoid companies that may be liable for higher levels of taxes based on their activities (or indeed increased taxes in future)
- Longer-term this should lead to superior investment performance from a risk/reward standpoint hence is perfectly in line with a Trustees fiduciary duties as well.
- Many studies have been done in this field in recent years. It is fair to say that, at least, integrating ESG factors improves the downside protection while potentially improving the upside. Other studies have also shown positive correlation between ESG score improvements and performance

ii)

- Exclusionary screen:
  - ESG analysis can be done through a screening process, mainly to filter out certain investments which stick out from an ethical perspective (tobacco, gambling, human rights violations, etc).
  - Inclusion in the JSE SRI could be a prerequisite
  - This is simply an overlay to the “mainstream” analyst’s research process rather than integrated
- Shareholder engagement:
  - Place greater emphasis on active ownership of shares, believing engagement to be fundamental in facilitating change at company level, rather than the approach of excluding “unfriendly” shares on the basis of their ESG rating.
  - This can be achieved at various levels – by simply proxy voting on behalf of clients according to certain principles to actually actively engaging with company management on critical issues
- Integrating risk measures into the process
  - Reviewing the financial data of a company, we should also include an analysis of intangible factors and “softer” items including...
    - how a company deals with its environment, how it addresses its labor force and supply chain (i.e., social items),
    - how aligned the management team is with outside shareholders (i.e., governance).
    - environmental impact of operations,
    - tax compliance
    - and alignment of performance targets
    - Corporates provide integrated reporting (triple bottom line) which focuses on not just economic but social and environmental impact of companies
  - Forming a scoring system/ranking tables

- Scoring system should be formulated to take these wide variety of issues into account – each with a suitable weighting
- Ranking tables are also commonly used by managers to rate companies on ESG factors, which are then integrated into the investment decision-making process
- Can use ESG data from third-party vendors to construct these

#### Portfolio construction

- Shares which score poorly could be excluded or
- A poor score may not mean they will not invest in that particular stock in the future. Could be a trigger to continue our engagement with this company's management team and keep track of any potential progress in this area.
- For benchmark cognisant managers this leads to a decision to overweight or underweight a stock in the portfolio
  - Though, in benchmark construction, the JSE SRI could be used which will align the incentives
- In case a PM is benchmark agnostic, it will be more of a buy or not-to-buy decision instead of an over-underweight decision, or could alter the level of conviction for a buy call resulting in a scale down
- while managers who have the ability and correct mandate can even include the option to go short certain stocks.
- Key when integrating ESG factors into an investment analysis is to focus on materiality, i.e., factors that are likely to have a material impact on the (longer-term) sustainability of a company's business model and its share price performance.
- On a portfolio level, a PM can also track the average ESG score of his/her portfolio (potential vs. a benchmark) and optimize risk/reward in this respect

#### Challenges

- Dedicated resources - analysis done by a separate ESG team or using third party vendors which add a layer of costs
- This could be passed on to the client (which may meet with resistance), or internalised thereby reducing net income
- Local asset managers have the challenge of a smaller market relative to their global peers in which to invest, making it more difficult to buy or sell a company based on ESG criteria.
  - Particularly given the presence of companies like BAT which is the top ranked share by market cap and represents a significant proportion of the JSE Top 40
  - Managers which are sensitive to benchmark would have to move far from their benchmark in order to exclude a share like this
  - Unless the benchmark was also adjusted to take this into account

- For this reason why voting and engagement may, in the SA context, be the key tools to influence a company's behavior
- The difficulty with “non-financial” factors (the “E” and “S”) is they can be more difficult and complex to quantify.
- There remains a lack of reliable and accurate ESG information and a lack of standardisation. as sustainability reports issued by companies in SA are not required to be audited
- The benefits of being responsible investors are only experienced in the long term, with clients and industry typically more short-term focused when it comes to performance measurement
- A concerted focus cannot be divorced from cultivating awareness amongst clients – or a general trend of awareness amongst clients