

Actuarial Society of South Africa

EXAMINATION

November 2016

Subject F205 — Investment

Specialist Applications

EXAMINER'S REPORT

This paper was not a particularly tricky paper, and gave well prepared candidates good opportunity to do well. Many mid-range candidates covered the points broadly (which indicated a broad knowledge of the subject matter), but without specifics demanded by the question and the fellowship standard. These students would generally receive either FA or FB. As per recent trends, there are an increasing proportion of students who are simply unprepared to sit an exam at this level.

QUESTION 1

This question called on candidates to examine a fund's performance in the context of actual market history. It required knowledge both of investment styles and practices, and market history. Not only that, it also required application and synthesis for candidates to do well. Marks were awarded generously to candidates who applied their knowledge to the scenario at hand.

a)

- A value style manager can be expected to hold shares that are priced below their intrinsic value -according to his/her independent valuation.
 - A deep value style manager will typically hold shares that are significantly underpriced relative to intrinsic value – often as a result of specific or market related events. This can represent a contrarian view.
 - The idea behind the philosophy is that these shares are out of favour but have been undersold, and given time and development of the economic cycle will return to normalised prices
- In the last few years shares in certain sectors have experienced significant price falls as the economic recovery lost pace and a slowdown in China was becoming evident.
 - Good examples of these are construction shares and commodity shares
 - Deep value managers could have over-weighted these shares as prices fell below what they believed to be the long term intrinsic value
 - Over the last 12-18 months, the situation described above has worsened and these shares have fallen even further
- Sectors which have done well are financial and certain industrial shares, particularly those rand-hedged shares such as Naspers and SAB, BTI and these have driven market performance
 - Value and particularly deep value managers would have been underweight these shares as they have been priced at very high PE's for some time.
 - So, relative to market performance (ALSI) the deep value managers would have underperformed significantly over the last 1-3 year measurement periods.

- They would, however, be expected still hold their positions in the belief that over the long term the cycle will turn and prices will normalise – any capitulation could indicate style drift and should be carefully monitored

b)

- Once manager has been fired it may be important to remove assets from him as quickly as possible
 - He may neglect the portfolio
 - Or at least not place as much focus on it as in a going concern scenario
- New manager may not be in an immediate position to take on new assets
 - Mandates and agreements need to be set up and accounts opened etc – which takes time
 - New manager will likely also not want the existing assets
 - This will drag on his performance as he takes time to re-arrange the portfolio
 - Especially as the portfolios are so different – very concentrated (20 shares) versus an ALSI tracker which could potentially hold over 100 shares
- Appointing a transition manager will carry an explicit cost
 - but the benefits of having an independent who is able to trade efficiently and quickly into the new portfolio may outweigh the costs
 - The transition manager would manage the trading in order to minimise costs (market impact costs, brokerage etc.)
 - This is particularly important if any of the counters are illiquid
 - The TM would manage the trades to minimise risks relative to the target portfolio e.g. prioritise the trades that most reduce the tracking error

c)

- what skills does the transition manager have – how many SA transitions have they done previously?
 - Are they locally based

- Do they have adequate trading algorithms and techniques to reduce the cost of the transition and trade efficiently for the portfolio
- Do they have a dedicated team doing transitions – or is this just a “side offering” of an equity trading desk?
- What relationships do they have with brokers and what brokerage have they negotiated?
- They are effectively managing the portfolio and the transition may take some time – do they have systems in place to do reporting, pricing, regulatory compliance etc
- What potential is there for cost savings like crossing (do they do a lot of transitions/trades for different clients to provide these opportunities)
- On what basis will the client be charged a transition fee
 - The fee basis should only be on the shares which need to be traded – not the entire portfolio
 - The fee basis should incentivize the manager to perform the transition in an efficient manner for the client
- They should provide a pre-trade report indicating the potential cost of the transition, and the duration of the transition as well as indicate upfront any “problem” shares
 - Transitions offer opportunity for “frontrunning” of shares by transition managers
- What internal measures are in place in the organisation to ensure that the transition manager always acts in the client’s best interest – such as Chinese walls, adherence to code of conduct
- There must be pre-agreed methodology to measure the success of the transition – typically “implementation shortfall” is used.
- This involves comparing the performance of the portfolio through the transition versus what it would have been if it could have hypothetically switched to the new portfolio instantaneously.

QUESTION 2

This kind of open ended question tests that ability of candidates to apply their knowledge and assess the viability of an investment proposal. Applying lists was not sufficient, and candidates had to demonstrate that they were able to weigh up competing arguments, in the context of the scenario given.

i)

- Ultimately a suitable investment will provide a reasonable match for both duration and nature of liabilities
 - And provide a reasonable return with an acceptable level of risk
- An airport will likely provide a steady and predictable income stream
 - Which makes it a defensive match for pension fund outflows
 - The income source is likely diversified
 - landing fees charged to airlines, rentals charged to retailers operating in terminals, parking fees
- This income is real in nature, which is a good match for real liabilities of the fund
 - airport can raise fees and rents to counter inflation
 - usually not more than one airport serving a particular city so an airport may be a price setter (in terms of retail rents, car rental operator rents, parking fees)
 - However there is likely to be price regulation limiting this power somewhat (landing fees charged to airlines)
 - And airlines will always have the prerogative of cancelling the route if prices are too high
 -
- Likely to be higher than usual political involvement given the public private nature of the investment
 - This may mean a trusting relationship with the government is key, and the investment may be sensitive to political risk
- Investment is long term in nature
 - Most airports are not listed on stock exchanges. There is no quick avenue for an exit.
 - This is not a problem for a large pension fund with young members and a long term investment horizon
 - In fact this illiquidity may allow the pension fund to earn an illiquidity premium
 - Ultimate disposal will be time consuming and costly
 - This makes an airport investment only suitable for a very large fund where the illiquid airport does not represent too large a percentage of total fund size

- The airport has elements of a private equity investment, which introduces unique challenges
 - Has the fund got the administrative and governance wherewithal and experience in other similar ventures to manage the investment
 - Though this may mean a higher expected return - as per the private equity premium (limited number of institutions who could make this investment)
- Overall, an airport may represent a good fit for a large pension funds long term, real liabilities
- Apart from political risk there is also potentially a lot of commercial risk:
 - If the economy of the country slumps air travel could dry up (think of oil producing countries)
 - There is currency risk; it could be as severe as the inability to repatriate profits

ii)

- The capital amount required will need to be assessed against the inherent value of the stake in the airport
- Given the going concern nature of the airport, as well as relatively predictable revenue streams, this will be performed on a DCF approach

Income

- How is income generated and split between?
 - Fees charged to airlines
 - rent charged to retailers
 - parking fees
 - Other sources of revenue such as advertising etc.
- The outlook for each of the above income sources:
 - Current capacity of airport
 - Are routes to this airport profitable for airlines?
 - Can the airport attract other airlines to use airport? Is it an open and free market?
 - Fees relative to other airports. Scope to increase fees. Is this regulated?

- What is rental rate charged to retailers/hotels at airport? Compared to malls? Scope to expand retail space?
- How many parking bays? Fees per bay? Scope to build more bays?
- What is the level of operating costs
 - Staff costs?
 - Is there scope to cut costs?
 - Or at least to improve efficiency with time
 - What broader political forces may hinder this given that government is the shareholder
 - Electricity, water and other utility costs and expected inflation in these
- Are there any capex requirements
 - Airport is a massively complex operation, and the state of the equipment, hangars, vehicles etc would need to be determined
 - Has airport been well maintained and if not what would be the cost of the backlog?
 - All airports eventually need to be refurbished. How far away is this? Cost of expected maintenance/refurbishment in coming years?
 - Need for expansion (another runway or terminal)
- Are there new airports planned for the area?
 - What are the regulations pertaining to new entrants?
- Country specific issues:
 - Historic inflation in the country. Expectations for future
 - Interest rates? Historic levels? Central bank target inflation? Successful?
 - Rule of law, property rights
 - Corporate tax rate
 - Special deductions for capital investment
 - Government policies and practice may not be investor friendly in the central African country
 - To what degree is there rule of law governed by independent institutions
- Currency risk: diversification is good.

- However some African currencies can be extremely volatile and may depreciate sharply. This would detract from the steady income characteristic of an airport investment.
- Also mismatch to currency in which liabilities are denominated.
- Hedging the currency may be difficult and/or prohibitively expensive
- Is the African currency fairly valued
- How is the ZAR vs African currency expected to move over the investment horizon
- Difficulty in repatriating dividends received back to South Africa.
 - This is a common challenge facing SA companies operating in Africa.
 - Will fund have sufficient cash flow should dividends from the airport investment be temporarily halted for a few months?
- Growth outlook for region
 - GDP growth
 - city economic development and expansion plans
 - how much of country's trade goes through the airport? Room to grow this share?
 - outlook for tourist numbers
- Risk tolerance of the fund: an airport in central Africa may be more risky than an airport in Western Europe. Does the pension fund have the risk appetite for an unlisted, illiquid, large investment in a foreign country?
 - How to take this into consideration: use higher discount rate in DCF is one option, limit the size of the investment in relation to the overall fund (ie only suitable for a very large SA fund)
- Pension fund members (mostly South African citizens) may oppose their fund being used to invest in infrastructure outside of SA, rather preferring investment be restricted to within SA borders where they would argue it is needed more.
- A 49% stake is non-controlling. What rights will the pension fund have as a minority investor?
 - Will pension fund be allowed board representation
 - What will voting rights be? Will the African government always have its way as the 51% owner? This will impact negatively on the valuation

- The lack of other private investors means unable to share the governance load and less able to stand up to the majority shareholder.
- Governance challenges: composition of board.
 - Does fund have expertise in managing private equity investments?
 - Expenses of administering this investment will be high
- SA pension fund regulation: reg 28 stipulates restriction on investment outside SA.
 - How large is the airport investment in relation to total pension fund AUM. Will reg 28 offshore investing limit be breached? An additional 5% allowed for investment in Africa is allowed.
 - Stake will be unlisted which is also limited by reg 28 to x% of fund. Only larger fund will be able to buy into this investment
- How to measure performance of the investment. Would need to carry out periodic valuations. Expensive as would need to appoint external expertise for independent valuations.
 - Are there environmental issues which need to be considered?
 - What is the infrastructure to/from the airport?. Is the government committed to improving this?

iii)

- The concession in the form of upfront payment by investor in return for right to operate airport for 15 years and earn a profit

Government

- Concession may be more politically expedient than outright sales as public will not view the asset as being foreign owned
- Though in that term, government may have less say in the running of the airport than if they own a controlling stake in the airport company
- After the 15 year term the government can either renew the concession or bring the management back internally if the arrangement was a failure
- However the sum raised from the awarding of the concession upfront may be smaller than outright sale due to the relatively short term
 - Which reduces the contribution towards government's aim of raising money
 - So may be unacceptable depending on the broader fiscal picture
 - However, it may be open to a wider audience of potential investors

- And the government may have to (partially at least) foot the bill of capex to expand or improve the airport as the concessionaire will likely see the 15 year term as too short to recoup the capex investment plus an adequate return
- The ongoing maintenance of the airport may present a risk as the concessionaire – particularly in the latter stages of the 15 years...
 - So this will have to be explicitly agreed and measured

Pension fund

- The relatively short term of 15 years is not a long time horizon for a pension fund.
 - Even if the fund has an older profile
- The discounted present value of future profits expected might not be large enough for it to be worth a pension fund to invest in such a private equity deal
- Who spends capex in concession model? Will private equity investor be prepared to invest significant capex in airport if payback period is limited to less than 15 years? This is unlikely. Government is cash strapped and is unlikely unwilling to invest capex
 - But concessionaire would need to spend maintenance capex. Who decides what is maintenance and what is expansion capex?
- In outright buy, an investor might want to invest capex (another runway, more retail space, more parking) knowing that the IRR of this capex is high. However the term /payback period for this investment might well be longer than 15 years.
- How much discretion will concession operator have in concession?
 - Will it have power to raise retail rents, landing fees etc?
 - Likely to be a greater degree of restriction than in an outright purchase
 - Though may be more than a minority stake in the airport as operations are fully controlled by the concessionaire
 - Will operator be allowed to cut costs and fire staff if required?
- It may mean a smaller investment, which reduces the risk and may increase the appetite for participating
 - And reduce the risk of the investment as it may be easier to exit

QUESTION 3

This question called on candidates to think through the fundamentals of how various companies are valued, and demonstrate their ability to hypothesize about a given scenario. Candidates who outlined specific mechanisms for value generation did well. Also, a good understanding of investor requirements was needed to think through risk mitigation strategies.

a)

- In general the value of any company is the present value of future cash flows paid to shareholders. These cash flows are dependent on the profitability of the company.
- The discount rate shareholders use to discount future cashflows to the present is based on a risk free rate plus a risk premium. The risk free rate is often based on the yield on 10-year government bonds. If spike in this yield then a higher discount rate results which in turn lowers the PV of future cashflows, which in turn lowers the intrinsic value to shareholders.
- Exchange rate effect: in Dec 2015 the spike in 10-yields was accompanied by a weakening in the ZAR exchange rates.
 - Reasons for this are complex, but were dominated fears of downgrade following expectations of fiscal imprudence [*or well argued mechanism*]
 - A weaker ZAR has the effect of boosting the value of assets denominated in foreign currencies

A life insurer selling primarily guaranteed annuities

- Guaranteed annuities are backed by long dated bonds. The extent to which the annuities are matched will determine the effect of a spike in long bond yields.
 - In theory, if the annuities are exactly matched then a spike in interest rates will have an equal effect on the assets backing the liabilities and the PV of the liabilities.
- However if there is a mismatch (perhaps due to a lack of bonds of sufficient duration), then the drop in the value of the assets backing the annuities may be smaller/greater than the fall in the PV of the future annuity payments.
 - In the case where the assets used to back the liabilities are of shorter duration than the liabilities, this will benefit shareholders as the assets will fall less than the PV of the liabilities.

- In the opposite case, where assets fall more than the PV value of the liabilities, the company (shareholders) will be required to allocate additional capital to ensure the business remains solvent (which represents a loss)
- The SA market lacks bonds of sufficiently long duration to fully match long dated liabilities like guaranteed annuities. This necessitates either remaining mismatched or using alternative strategies to achieve matching (eg swaps).
 - For mismatched portfolios, there is reinvestment risk: higher interest rates are generally more favourable when reinvesting coupons/capital repayments in a bond portfolio. This is good from a shareholder perspective.
- Guaranteed annuities become more attractive to new retirees (higher annuity payment per R100 000 capital) who may have rather bought a living annuity instead.
 - This may lead to higher new business sales and future profits which boosts shareholder value.
- In both cases the insurer would have margins or contingency reserves built in to absorb the impact of significant adverse interest rate moves.
 - Though those reserves would need to be replenished for further adverse movements
- Higher interest rates are often (and certainly in this particular case) accompanied by higher uncertainty which translates into higher market volatility. This increased volatility increases the cost of options used for hedging guarantees. This detracts from shareholder value.
- 10 year bond yields are correlated with inflation, meaning a second order effect of higher 10-year yields, the higher than expected inflation.
 - If the insurer's operating cost inflation is higher than assumed in the annuity pricing, then future profits emerging from the annuities may be smaller than expected and lower the value of the book of business to shareholders.

An insurer selling mainly pre-retirement smooth bonus funds

- Smooth bonus funds are usually backed by a balanced type portfolio with equities, bonds and cash instruments.

- The life insurance company makes a profit by charging a fee based on size of AUM. If the spike in yields cause the value of bonds to fall then the fees charged on the lower AUM will be lower.
- Similarly with equity market prices if the spike in yields causes equities to fall.
- The life insurer's future operating costs will not decrease. In fact they may increase due to higher inflation as suggested by higher 10-year yields. The discounted PV of the lower fees less the higher operating expenses in future will be smaller.
- Offsetting factor may be an allocation to foreign assets (denominated in foreign currency). A weakening in the ZAR exchange rate (which accompanied the spike in bond yields) will boost the rand value of these assets which will help boost the insurers AUM.
 - Reg 28 governs the asset allocation of pre-retirement vehicles and this limits the foreign portion at 25% which limits this offsetting factor.
- Smooth bonus products also have guarantees that policyholders are offered. If the value of the assets falls below the guaranteed level, the company (shareholders) will need to shareholders capital to make good of the guarantees. This will reduce shareholder value.

A retail bank selling mainly home loans and vehicle finance

- Bank makes money by charging interest on loans made, less the bank's cost of funding, less operating expenses.
- Interest charged on loans is mostly variable and based on prime interest rate. This is NOT directly linked to 10 year government bond yield. However spike in 10 year yield may indicate expectations of higher inflation in the future and necessitate the Reserve Bank to raise short term interest rates. This would be beneficial to banks who charge higher interest.
- But higher rates may result in higher bad debts which will harm profits. Bad debts often follow higher rates with a lag in time of 12-24 month.
- Bank fund themselves with 3 sources: shareholder equity, deposits and wholesale funding (money market and bonds). Cost of funding in bond market linked to yields on government bonds and short term rates (JIBAR).
 - To the extent that a banks wholesale funding is floating (JIBAR + x%) a spike in interest rates will increase the cost of funding.
 - Any fixed cost funding will remain unchanged and will contribute to an improved net interest margin (interest rate charged to customers minus interest paid to funders).

- Interest paid to depositor is usually very small so a spike in 10-year yield will also improve the net interest margin.
- Higher future expense inflation as suggested by higher 10-year yield will reduce profitability.

b)

- “Cando” is an innovation from the JSE Safex which to date is still relatively unique, i.e. not widely available even in developed financial markets.
- Cando derivatives essentially enables counterparties to list (subject to approval from the JSE) practically any derivative on any underlying instrument on the exchange
 - (there are some limits to what can be handled by the JSE system in term of valuation, as well as limits due to e.g. exchange controls).
- Once a Cando instrument is listed, the JSE provides it with a unique instrument code and publishes the instrument specification for the instrument.
- Any counterparty is then able to trade in futures or options on this underlying instrument.
 - JSE acts as the clearing house
- Options are valued based on an independent valuation team’s model
 - The valuation is conducted at 5pm daily and variation margin is based on that valuation
- There has been relatively substantial interest in this market since it opened, specifically with reference to listing either
 - “vanilla” put or call options on specific underlying baskets of shares (i.e. other than existing indices),
 - or to list exotic pay-off profiles (e.g. binary or path dependent) on indices.
- Advantages for investors
 - This functionality therefore combines the flexibility of OTC contracts...
 - with the advantages of an exchange traded derivatives

- such as reduction in counterparty risk
- and Independent, well defined, daily valuation
- JSE as clearing house eliminates counterparty risk (or at least makes JSE Clear the counterparty)

c)

- The central challenge with derivatives of this nature is that their pay off profiles are complex and the relationship to their underlying instruments and indices may will not be simple
 - It is critical to the fund that they understand the risks that are taken when entering into these contracts
- The counterparty risk of the transaction is mitigated by the JSE acting as a clearing house
 - However, as part of a due diligence, the financial standing of “JSE Clear” should be considered.
 - While there is daily mark-to-market, this is dependent on the computations of a central valuations team
 - To what degree are their models susceptible to being incorrect and failing to take into account risks that may be emerging in the security
 - Which would invalidate the mark-to-market practice, as large shifts in risk without the concomitant recognition in the model would make the system susceptible to sudden and large capital requirements in tail events
- To mitigate this, the fund should ensure that they have an independent valuation model of the derivative
 - And monitor changes in their valuation vs that of the JSE Team

d)

- CDS definition: A credit default swap is a particular type of swap designed to transfer the credit exposure of fixed income securities between two or more parties.
 - In a credit default swap, the buyer of the swap makes payments to the swap’s seller up until the maturity date of a contract. In return, the seller agrees that, in the event that the debt issuer defaults (or experiences another defined credit event such as a downgrade), the seller will pay the buyer an amount (usually the face value of the underlying security).

- Generally used as insurance against default on a credit asset but can also be used for speculation. This is because the buyer of the credit default swap need not own the underlying debt security.
- It is a credit instrument. CIO wants to hedge equity instrument which is not the same thing.
- CDS might not be available for particular bank/insurer held in CIO's fund
- Does fund's mandate allow investment in such instruments?
- A bank/insurer's debt ranks higher than shareholders equity. A bank/insurer might approach insolvency (wiping out shareholders equity) without defaulting on its debt.
 - However specific events that may increase the likelihood of default of a specific bank would likely have a negative impact on their share-price
 - And any increase in default likelihood will increase the value of the CDS which will hedge the fall in the equity price
- Though there are many factors would introduce noise into this relationship
 - And it would be difficult to determine the quantum of the position to take
- How the CDS is valued will affect how it is reflected in performance of the fund
 - Is there a deep secondary market for it and how regularly is it marked-to-market
- Could be expensive: buyer of CDS pays a premium which may now be high due to higher volatility.
 - If no credit event, this will act as a continual drag on performance of the fund.
- The counterparty is likely to be an investment bank: same type of institution trying to hedge against downside risk! Credit risk of counterparty needs to be carefully considered.
- Overall it would appear to be a suboptimal hedge for this equity fund