Actuarial Society of South Africa

# EXAMINATION

## May 2019

## Subject F205 - Investment

## Fellowship Applications

## MARKING SCHEDULE

*The scripts received suggested a mix of bookwork preparation by candidates. The quality of scripts was quite widely dispersed ranging from a clear passes to a handful of low FC scores. Higher order thinking questions were also worse handled than previous sessions, for the most part the standard required for a pass was not evident. Question 3 posed a fairly standard investment actuarial problem yet the quality of responses to this question was surprisingly poor. This exam was felt to be in line with previous diets. Questions were, again, broken down into components in order to assist candidates. It appeared that the allocated time was adequately managed by candidates, with very few not finishing their paper in time.*

*Please not that this examiner report presents one possible model solution to the questions. Alternative solutions provided are considered and marks awarded where correct points are well motivated.*

## QUESTION 1

*Part (i) was poorly answered, most candidates failing to discuss the observed returns successfully in terms of market experience and id not discuss sequence of returns, a key issue here. Part (ii) was a knowledge question and was well answered by most candidates – identifying the key strategies adopted by hedge fund managers. Part (ii) was, again, very poorly answered. Candidates were not familiar with this important piece of recent legislation. Part (iv), only for 2 marks, was well answered as only the key issues were required for so few marks. Part (v) required higher order thinking and was, as is usual, not well answered. The majority of candidates did not generate enough ideas to score sufficient marks for this heavily weighted question. While some of the key considerations around this type of property investment were discussed (rentals, tenant quality, maintenance) very few discussed this investment and associated risks in the context of the Section 12J and to include discussion of the manager and the client. Points around outlook for SA economy and property market were also missed.*

i.

- The managers have not been able to achieve returns in line with their benchmark. Inflation has been around 5% over the past 5 years, which means the benchmark was around 10%.
- For income to increase by CPI and capital to maintain value in real terms the return must be at least CPI+4%p.a. plus total fees. This might be even higher than the target of CPI+5% as average fees would typically be between 0.5% and 1.5% (depending on manager fees and broker fees).
    - Volatility of return (e.g. very poor returns in the early years followed by high positive returns) can also negatively affect the sustainability of drawdown, even if the “average” net real return is at or above 4%. (Sequence of returns risk).
    - Gradual erosion of real value of capital can be allowed for due to reducing life expectancy but this should be over a very long period. In practice this means the 4% can gradually increase with age.
- Even the highest performing asset manager didn’t outperform inflation +5% (only managing around 4% above inflation).
    - Looking at the volatility, the manager had to take higher risk than the group to achieve this performance.

- Manager returns are in line with market returns - the ALSI returned around 7% whilst the ALBI returned 9% (5 years to the end of Mar/Jan? 2019). This means the opportunity to outperform inflation was limited over the past 5 years.
- Most managers barely kept up with inflation before fees and probably lost capital in real terms after fees. Advisor fees (paid to the IFA) will have added to further capital erosion.
- The lowest performing asset manager actually lost money in real terms before any drawdown or fees.
- Given the initial drawdown rate of 4% and subsequent CPI increases, most clients would have experienced a capital loss, resulting in annuitants who maintained their real level of income experiencing an increasing withdrawal rate as a percentage of capital.
- Once the underlying performance cannot sustain the income being drawn, the underlying capital has to be used to supplement the income.
- One exception is if a client had been invested in the top performing manager(s) only, it seems that it might have been possible that an annuitant could have sustained the 4% withdrawal without a capital reduction; however, this comes with additional capital volatility compared to the other average managers. (In this case maintaining the real value of capital also depends on the sequence of returns delivered – refer to point above on sequencing risk).
- If clients based their real level of expenditure on their personal inflation rate (which may have been above the official inflation rate) this could exacerbate the situation.
- At some stage the capital will reduce to such an extent that the regulatory limit of 17.5% drawdown percentage will be reached. This would mean that clients will be forced to receive a lower income level each year, depending on underlying investment returns.

ii.

<u>Strategies</u>

Global macro

- These funds aim to profit from the fund manager's view of future movements in macroeconomic factors such as currencies, interest rates and asset prices. Macro strategies can be classified as either discretionary or systematic.

Event driven/merger arbitrage

- These funds trade securities of companies in re-organisation and/or bankruptcy (distressed securities) or companies involved in a merger or acquisition (risk arbitrage).

Relative value/Long-Short/Market Neutral

- Relative value managers aim to identify mispricing or expected return differentials between securities. Where these differentials are not attributable to the business prospects of the underlying firms, managers will only participate when they perceive a very high probability that the mispricing will be corrected or the expected return differential will be realized.

Marks are also awarded for listing Absolute Return Funds together with a description of how this strategy is applied.

Benefit of including:

- Each of the hedge fund strategies uses techniques to generate performance from a source that is not currently being utilized by the long only managers
    - This means if included, the opportunity set is broadened. As a result, the opportunity to outperform is increased.
- These strategies have been historically believed to have the potential for high returns relative to traditional asset classes, albeit with a higher degree of risk
- Depending on the strategy invested in, there might be diversification benefits and therefore reduce the portfolio's volatility

Practical considerations

- What is a suitable percentage to allocate,
- Are one or more of the main hedge fund strategies to be included,
- Should they be introducing more portfolios in addition to the existing ten with the hedge fund component already included in the multi-asset class e.g. multi-manager portfolios or
- rather having hedge fund building blocks available to be 'bolted onto' the existing strategy,
    - rebalancing (if the bolt-on strategy used),
- are there any limitations e.g. living annuity providers sometimes apply Reg 28,
- Consider the need for IFA to select hedge funds and hence additional skills will be need
- Consider how assets should be transitioned from existing portfolios – where to reduce existing assets, timeframes etc.
- Consider the impact of including the hedge fund in the overall liquidity of the portfolio
- Can the client afford the minimum investment amount given their fund size?

iii.

- CISCA oversees the management of all regulated hedge funds in South Africa
    - This means for example TERs have to be disclosed under CISCA which is a significant change to the industry
- Funds must ensure a structure whereby an investor will not suffer a loss in excess of the value of the investment or the contractual commitment
- The regulation has introduced two types of funds – a Retail Investor Hedge fund and Qualified Investor Hedge fund

- The Qualified Investor Hedge fund is where the investor has illustrated he understands the workings and risks of the hedge fund (thus can be deemed an experienced investor) and commits a minimum of R1m to the fund
- The Qualified Investor Hedge fund requires less oversight and has no restrictions in terms of portfolio constraints
- A Retail Investor Hedge fund must provide monthly liquidity and maintain daily pricing. All marketing must be submitted to the FSB for review
- Foreign hedge funds can be marketed in SA with permission
- Only structures in trust arrangements formed under CISCA or Limited liability partnership will be allowed, and it has to use a Management company

iv.

1. Tax incentive - Individuals can receive a tax deduction up to 45% from S12J investments. This could be especially beneficial to high earning individuals.
2. Potential for higher returns - The VCC might be able to access higher returning opportunities compared to hedge funds available.
    a. Mainly because they are different – public v private markets, early stage v developed, new technologies….
3. Social impact - The aim of S12J's is to fund small and medium enterprises that stimulates economic growth – this might be aligned with an investor's personal goals.
4. The investor might want to diversify his portfolio.
5. Hedge fund returns have, in recent past, not been very attractive. This could be structural or as a result of fewer opportunities available. Increased regulation in this space may also hamper the ability to generate returns seem in earlier decades.

v.

Underlying investment considerations

1. Potential property value growth
    a. What is the expected capital growth of underlying properties? This is a key consideration as it will determine whether this investment offers the potential for performance relative to other opportunities.
    b. Consider quality of property, is it new build/purpose built or needing maintaining? Is it halls or individual multi-occupancy houses?
    c. Is the property directly held as sole investor or through a common fund structure?
    d. Consider both the property market around the university as well as the overall property market
    e. The potential impact of unresolved property rights issues in SA
    f. This could be influenced by the state of the economy and interest rates – what are the expected interest rates over the next 5 years? If expecting a reduction, you would expect the general property market to benefit from this
2. Consider the level of gearing of the investment.
3. Time and process to achieve full investment i.e. once investors allocate their investments, how long will it take for all funds to be fully invested?
4. Concentration of underlying investment
    a. It seems like housing is only around one university – are there plans to diversify and offer housing around other universities or even to other sectors?

    b. If not, what does the prospects of the university look like? The trend in student enrolment might be a good indication of the future uptake and hence market prices and rental demand
    c. Impact of "Fees must Fall" movement on student profile at the university and hence demand for this type of accommodation.
5. Occupancy rate
    a. Is 90% occupancy market norm or is it on a downward trend? If normal, is it high enough to produce sufficient overall returns?
    b. What is the notice period – if very short for example a month, the occupancy rate can change rapidly?
    c. What clawbacks are obtained for example non-refundable deposits?
    d. What is the tenant vetting process?
6. Risk and opportunity of rental negotiations
    a. Since the rental terms are negotiated annually, one would expect rent income and hence dividends to keep up with inflation over the 5 year term, thereby matching the real income needs of investors
    b. Potential to increase rent may be curbed by political sensitivity against the background of "fees must fall" movement
    c. However, if the area becomes unattractive or building maintenance is not kept up, the renters could negotiate lower rentals quickly as well.
7. Maintenance costs
    a. How are these to be funded? Do they reduce rental income or are they paid out of manager fees?
8. Dividend timing and amounts
    a. Dividends are paid semi-annually which creates a mismatch between the annuitant's monthly income requirements. Will the clients be able to cope with the "lumpy" income provided by this investment?
    b. What is the expected dividend yield on the investment?
    c. Dividends are likely to be taxed depending on investor status
9. Funding of pay-out at the end of 5 years
    a. How does the manager intend on generating liquidity to fund investors at the end of 5 years? Properties are illiquid and takes time to sell.
    b. It is unlikely that the properties can be sold simultaneously without the price being affected.
    c. If the manager intends on rolling the properties over into a new fund, how will the underlying property values be established. Preferably by an independent valuator.
10. Tax risk – a significant risk as heavy penalties could be applied for non-compliance
    a. Does the fund have S12J status? Proof will need to be provided as well as independently verified.
    b. Will the fund regularly be audited over the 5 years to ensure it still meets the S12J requirements?
    c. Was and will there be any independent tax opinions requested?
    d. The meal coupons are a requirement for the investment to keep S12J status – who will ensure that these are effectively managed in line with SARS requirements?
    e. Section 12J has a limited window – how does this affect the decision?

11. System risk
    a. Does the manager have the sufficient systems in place to ensure that the fund is compliant at all times?
        i. Are admin processes sufficient?

Client considerations

12. Level of financial sophistication
    a. Would the clients understand the opportunity as well as the risks associated?
    b. Both VCC and S12J structures are complicated, which suggests these types of investments are more suited for highly financially sophisticated clients.
13. Total level of investment value available
    a. Is it possible for the individuals to invest minimum amount?
    b. Given the risk profile of the investment, clients should probably invest a small percentage in this investment [candidates can also say the portfolio should not be overly concentrated in this investment].
    c. Maximum percentage of any client assets to be allocated to this investment e.g. if 5% then client must have R20m total assets to reach the R1m minimum.

14. Current investment portfolio
    a. Level of diversification with remainder of portfolio sufficient/current exposure to property investments?
15. Risk appetite/Unregulated assets
    a. S12J is largely unregulated- would the potential clients understand the risks associated with the limited regulation of this investment?
16. Liquidity requirement
    a. S12J – you cannot disinvest before 5 years. Does this lock-in period suit clients? The penalties from SARS would probably be severe, making access to funds very difficult.
17. Dividend reinvestment
    a. If the dividend payment is not needed for income, how will these payments be re-invested?

Manager considerations

18. Manager knowledge and track record
    a. What track record/previous experience of the manager is available in this sector?
    b. What is the size of the manager – AUM?
19. High fees
    a. The fees are likely to be expensive and probably justifies some negotiation
    b. Otherwise, does the performance expected sufficiently compensate the fees charged?
    c. When are performance fees crystallised?

20. Other investors
    a. Does the manager have other investors that are interested in this opportunity or who have committed capital? What is the typical profile or reasons why they have invested in this fund?

Other considerations

21. Experience and comfort in selecting a manager
    a. This will be the first time that IFA will be selecting an alternative manager – is he comfortable/adequately equipped to do this?
    b. Can be mitigated by outsourcing the selection of the manager, however an additional layer of fees will be introduced
22. Are there other similar funds you could compare this one to? What other S12J or alternative investment opportunities are available and how does this one compare?

23. This will take a lot of effort/research before an investment can be made. Given the R1m investment requirement, this investment will only be available to a few clients. It might be more beneficial for your friend to focus his efforts on an investment with lower minimum investment requirements.

How will valuations be performed on the underlying investments and the fund?

## QUESTION 2

*Candidates handled Question 2 the best of the three questions, on average. High marks were scored for parts (ii) and (iii) – the average score being well above a pass. CAndiates provided a reasonable asset allocation stategy for the most part and handled the knowledge component of part (iii) well. This is not surprising as manager selection and due diligence has frequently come up in past papers – so the well-prepared candidate scored well here. Part (i) was the most poorly answered part of this question – in particular (i)(b). Not surprising since this required more insight. Candidates failed to use the information provided in the question successfully – either ignoring this or misreading what was provided. Few discussed the implication of Actuaria being a developing economy and the size of the SWF as limting factors. Also, a surprising number of candidates suggested investing in green energy projects as a way of diversifying the economy of the country! The discussion on rated of return expectations was also missed. Part (iv) required candidates to consider an unusual investment opportunity and not enough ideas were generated by candidates (the solution shows many available marks compared to the mark allocation). It was disappointed how few discussed issues pertinent to developing country healthcare (ageing population, social security) – again not using information provided in the question. Another example of missing information provided in the question was evident in that hardly anyone discussed the fact that 50 hospitals were spread across 10 countries.*

i. a)

- Any existing documentation that may exist incl. possible trust deed/MOI/investment policy statements, government regulations etc
- Current assets :
    - What is the current asset structure? Who is currently managing the assets? Do they have further documentation or insights which they may be willing to share?
- Legislative framework within which the SWF operates
- Size of SWF is known but what has the rate of growth been over the last decade. What is expected going forward?
- Sources of income:
    - How much cash does the SWF receive each year and the timing of these inflows?
    - Variability of the income (presumably is volatile and fluctuates with international oil price as well as global supply and demand for oil). Or do they hedge their prices?
    - Are there other sources of income beside oil and gas related cash flows? How large are these other sources of income and how reliable are they? Annuity in nature or ad hoc?
    - What is the expected life of the oil/gas reserves?
    - What is the outlook for the oil and gas industry?
    - What is the political and economic outlook for the country?
    - What is the expected cashflow profile for the cash received from the oil/gas assets? (e.g. are the assets still ramping up or are they mature and steady state or is the cash flow in permanent decline?)

- Liquidity requirements of the SWF:
    - Are there any regular cash outflow obligations from the SWF, perhaps to fund the funding of social/development needs of the government?
    - At what rate have these regular outflows grown over the years?
    - What other know major projects or commitments are there imminently, particularly those with social/development impacts
    - What environmental rehab liabilities exist and how are these funded?
- Admin expenses/overheads and other costs incurred in running of the SWF
    - How many staff are employed and is this adequate/over staffed?
    - Is the SWF sufficiently skilled for its mandate?
- Size and liquidity of local capital markets – given this is a developing country
- Permitted assets
    - And any restricted asset classes/instruments
    - Is investment in foreign asset classes permitted?
    - Any restrictions on how much cash can be held
    - Income will be in dollars, will you hedge local currency conversion?
- How are unlisted assets valued?
- Tax status of fund

i b)

- Liabilities would be very long dated (intergenerational in fact. This is longer than pension funds).
- This long-term nature is associated with ability to take on more investment risk.
- Liabilities are denominated in local currency. This would imply mostly domestic assets are appropriate.
    - However the local capital markets of this developing country are likely to be insufficient. This may necessitate foreign investment.
    - In addition many local companies are likely to be involved in the local gas/oil industry. In line with the SWF's objective to diversify the economy away from oil/gas, these investments should be avoided.
    - Diversification by geography is also desirable as it grants access to companies/sectors not available in the local market.
    - Liability may have an element of external currency impact if material and skills for the various projects are imported.
    - What will the effect be on the exchange rate if large amounts of assets are moved offshore?
- Real in nature: goal is to grow funds for future generations. This would imply a high allocation to long term, growth assets like equity, private equity, property.
- Liquidity requirements
    - likely very low as one of the objectives is to grow funds for future generations and the size of the fund is very large relative to GDP
    - There may be small liquidity requirements to fund social spending and perhaps sporadic tax shortfalls
    - The low liquidity requirement grants the SWF the ability in invest in illiquid assets and enjoy the related illiquidity/complexity premium

    - This implies the asset classes such as infrastructure, real estate, and private equity are appropriate options
- Sometimes a SWF is very large and can move market prices, so it may take a long time to enter/exit investments without unduly affecting price of asset. This is especially relevant for the Actuaria SWF as the local capital markets may be small and illiquid
- Funding source: if all from one asset (oil field) makes sense to diversify away from this industry. Investment in oil producers and those involved in exploration for oil is likely to be ruled out
- Political objectives?
    - How independently managed is the SWF? IS there political interference?
    - Will investments need to drive current ruling party's ESG agenda?
- Risk profile/tolerance: the long-term nature of the liabilities and low liquidity requirements imply an above average to high risk tolerance
- Therefore larger share of real assets like equities would be appropriate
- Rate of return expectation:
    - One stated goal is growing the fund for future generations. This implies maximising returns
    - As a developing country the need for investment in social and economic development is likely to be very large (the per capita GDP of $2000 is very low implying the country is one of the world's poorest. SA's is $13000, Switzerland's is $61000)
    - Maximising returns may conflict with the other stated goal of funding social and economic development. These initiatives may not yield the highest expected return. How to balance these conflicting objectives when setting investment strategy?
    - There will be expected second order return to the economy from investing in social and economic development which may be hard to measure but must be taken into account
- Taxation of investment income and capital gains

ii.

Asset allocation proposal is open to interpretation: as long as the student gives justification and the strategy is justifiable in the context of the question.

- Equity – listed vs unlisted
- Bonds
- Infrastructure and impact investments (ie strong ESG focus)
- Cash
- Property – listed vs unlisted
- Offshore (must be included)

iii.

- There should be a quantitative process to start with the full range of potential emerging market managers and then the full list can be reduced to a short list of managers where an *in situ* due diligence would be conducted following the completion of a due diligence questionnaire.
- Scale of the operation:
    - Current AUM, and how fast this has changed over time and across various strategies
    - How scalable is the current investment process
    - Number of current clients as well as client lost and won over time.
- People:
    - Experience, track record
    - Depth of resources (number of analysts covering each sector) and key man risk
    - Continuity and staff turnover
    - Retention mechanism and incentivisation
- Investment management philosophy
- Investment process:
    - Need a clear understanding of how investment decisions are made
    - How this has evolved over time
    - Internal vs external research
    - Approach to asset allocation, portfolio construction
    - Global emerging or country specific portfolios – if global then country allocation
    - Risk management process
- Current portfolio holdings and whether they are aligned to investment philosophy. This should be checked historically
- Risk management and internal control processes
- Business management
    - Quality of systems
    - Policy for capping AUM
    - Staff training/development for business continuity
    - Operational risk controls including compliance
- Performance record including performance attribution
    - How has performance compared to stated benchmarks
    - How long does the track record exist for – sufficiently long period of time? Ie through market cycles.
    - Potential benchmarks to be managed against and how they align to the fund's requirements
    - Has manager stayed within stated tracking error (or other) risk restrictions
    - Return vs peers
    - Volatility of returns (risk analysis which can include drawdown analysis)
    - Are performance numbers GIPS compliant or compliant with other relevant standards?
- Fees and other costs or charges
- Is the manager based locally or offshore? If an offshore manager is used do they have a presence in the country?

- What is the investment manager’s policy toward ESG/SRI. How do they currently incorporate this in their portfolios – if at all?
- Practical considerations – do they run pooled or segregated portfolios (or both).
- Operational capability and extent to which operations are outsourced.
- How are conflicts of interest dealt with and resolved

- Termination conditions

iv.

- Developed countries generally have ageing population. This means increasing demand for healthcare services like hospitals which would provide a long-term secular tailwind for Medico revenue
- Many developed countries have excellent public health systems. However many of these public health systems are stretched and over utilised/underfunded. Medico might benefit from the increased demand and limited supply
- Assuming Medico can increase its tariffs by at least inflation each year, the growth in volume of patients may imply that Medico will be able to grow its profits in real terms in hard currency over the long term. This is a good match for the SWF real liabilities and desire to grow the assets of the funds over the long term
- Key to the investment decision is the price the investment will be offered at – assessed against associated risks
- Hospitals have limited working capital requirements and generate good cash flow. This cash flow may be paid as dividends or reinvested in the business. The SWF has limited cash outflow requirements so reinvestment in the business may be preferable

- Hospitals have finite capacity and if demand grows the hospitals may need to be expanded or new ones built. This will require additional capacity (funded by retained earnings or fresh capital)

- Term: as a going concern company, which will generate profit in perpetuity, the long term nature of cashflows is a good match for the long time horizon for the SWF
- Profits are generated in foreign currency. This is not a good match for SWF local currency liabilities. However, diversification by currency does have benefits
- This may be able to be hedged if instruments are available
- Being developed market based and not oil/gas related ticks the box of diversifying away from the local Actuaria economy
- Also offers diversified exposure across 10 countries

  However:
- Ethical/political considerations: Actuaria is a developing country and is likely to have a poor local healthcare system. One of the Actuaria SWF’s objectives is to funding social and economic development in Actuaria. How can the SWF justify investing in developing market healthcare while “neglecting” its home country?
- A large risk to the business is regulation. Many developed markets are facing funding challenges and medical tariffs are being cut. One would need to understand the

regulatory environment in each of Medico's 10 operating countries as well as any potential changes on the horizon.
    - Are they able to adequately manage the risks of 10 different regulatory regimes?
- Scale of operation: 50 hospitals in 10 countries implies an average 5 hospitals per country. Can a hospital group be competitive with such small scale in each market? Medico would likely have limited negotiating power with regulators/funders with regard to tariffs etc.
- Clinical outcomes: does the hospital group have good clinical outcomes?
- Size of stake on offer: would have to be a meaningful stake to be worth the time and effort the due diligence would involve. However, although the SWF is very large, still need to consider concentration risk
- Who is selling the stake on offer and why?
- Who are the other bidders?(if any)
- How does this fit into the SWF investment policy and asset allocation? Does it complement existing investments or offer meaningful diversification?
- How will the investment be valued, and by whom – must be external, independent valuation.
- The SWF team must have the capability to monitor and manage the investment on an ongoing basis. This is not a passive investment and must be within the team's capabilities. What other direct investments requiring board roles/oversight do they hold?
- Strategic investment – there may be a strategic reason for considering this investment (e.g. they may be able to bring expertise or play some role in advancing Actuaria's healthcare sector such as adding an emerging market arm to their business that may benefit Actuaria).
- Exit strategy….

**QUESTION 3**

*Responses to question 3 were, on the whole, disappointing. Candidate scores were the lowest for the question. This could have been as a result of time constraints but it appeared to rather be as a result of not understanding how post-retirement liabilities can be hedged using swaps. Candidates handled part (i), suggesting that they understood how defined benefit liabilities are valued. Part (ii) and (iii) were poorly handled. Many candidates mixed up the parties receiving/paying fixed/floating. This is not the standard required from candidates at F205 level. For part (iii) the generic points around use of OTC derivative strategies (costs, lock-in) were made, but application to the scenario in the question was poor. Answers to part (iv) suggested that most candidates did not understand the role of an LDI manager. Part (v) was a challenge and required higher order thinking. Again it did not appear that candidate understood how a repo works (beyond being able to define one) and mixed up the parties to the transaction as for part (ii).*

i.

- Unaffordable pension increases have been granted in the past
- The valuation basis may have been changed to one which places a higher value on the value of liabilities
- Or a different value on the value of assets (for example a change from an adjusted long term value of assets to market value)
- Assets may have underperformed expectations since the last valuation
  - bond manager underperformed due to credit or duration positioning,
- Equity markets may have suffered a significant correction (relative to the size of the previous surplus)
- Interest rates may have changed significantly and the duration of the bond portfolio is quite different to that of the liabilities.
- The valuation rate used to value the liabilities may be unrealistically high compared to the underlying assets
- Mortality assumptions may have been too optimistic and pensioners are living longer than anticipated in the valuation basis.

ii.

- An interest rate swap is a derivative instrument whereby one party swaps floating rate payments for pre-determined fixed rate payments with another. The counterparty to the swap investor is a bank.
- They are OTC instruments and can be tailored to the needs of the investors.
- The fund would need to determine the liability profile for the pensioner pool – calculating the expected cashflows going forward in respect of pension payments.
- The main investment risk associated with the fund are interest rate and inflation risk.
  - Both can be managed by using swaps – to receive inflation-linked payments and/or extend the duration of the asset portfolio.
- From this the duration or interest rate sensitivity of the liability can be determined.
- The fund would then enter into a swap to pay floating and receive fixed payments
- The fixed rate payments can be tailored to hedge the interest rate risk exposure of the fund (by matching cashflows and/or duration)

- An overlay may be applied to hedge against inflation risk. In other words a swap whereby one party (the pension fund) pays fixed and the counterparty pays inflation-linked payments.
- Margin makes leverage possible requiring lower immediate outlay to hedge a given exposure than compared with a portfolio of government bonds. It is also possible to hedge liabilities for which no natural physical asset hedge exists
- Swaps can be collateralized but do not have to be – which leaves the investor exposed to bank credit risk. Two way collateralization requires management and available acceptable liquid assets

iii.

Considerations:

- What is the valuation basis used to value the liabilities –
    - is it with reference to the inflation linked or nominal yields,
    - and does it use a single point yield or a yield curve
- The timing of the decision to change to a matched strategy is important. Consider current pricing of bonds and swaps in the market.
    - Bond yields are currently high due to fiscal uncertainty and it may be a good time to take advantage of this
- How to manage the change and any required disinvestment of existing assets. It is likely that there may be illiquidity in the bond portfolio should significant assets be realized.
- Moving to a more passive LDI strategy would mean giving up additional alpha generated by the bond manager – which may be necessary to fund pension increases
- What is the pension increase policy and past practice in terms of pension increases? Do we need to hedge against inflation as well as interest rate changes?
- What portion of the assets would you want to allocate towards the hedged component versus the unmatched component.
    - An ALM exercise will help determine the degree of risk mitigation or matching required
    - Consider the funding level and the current pricing of swaps.
- Will entering into a swap be permissible in terms of regulations as swaps are considered derivatives
- Does the fund's rules allow for use of swaps/derivatives. Will the IPS need to be changed.
- Do the trustees (and/or their actuary or asset consultant) have the expertise required to enter into and manage such a complex arrangement
- The fund is very large and may wish to split the swap overlay amongst a range of banks in order to mitigate risks. One bank may be unable/unwilling to take on the entire swap. How do you select, monitor and manage counterparties?
- What other hedging mechanisms are available to be considered – e.g.: repos, cashflow matching, other actively managed LDI opportunities

Advantages:

- Will immunise the fund against interest rate risk (and possibly inflation risk) provided that the valuation basis is consistent with the interest rates being hedged
- The liability exposure to interest rate risk can be fully hedged without using all the funds existing assets [1]
- Swaps are OTC and can be tailored to closely hedge the portfolio
- If longer term government yields are historically high relative to floating rates you may be able to lock into a higher fixed component
- Can hedge very long term liabilities – swaps of longer than 50 years can be entered into

Disadvantages:

- There may still be "basis risk" between the valuation of the swap and the liabilities which cannot be perfectly hedged
- Liabilities may be measured off a bond curve not a swap curve
- Trustees will be locking into lower returns compared to the active bond portfolio
- Credit risk with the counterparty bank – even if it is a collateralized swap (how often is MTM done?)
- Will need cash for margin/collateral - especially if interest rates move significantly out of your favour
- Jibar may increase suddenly while longer term rates remain fixed
- Fund will be locked into a very long term agreement
- There may be an exit clause but this will come at potential significant cost
- Cost of the swap - can be quite expensive depending on position of swap curve relative to bond curve
- Legal risk – swaps are unique OTC instruments which leads to information asymmetry between parties and potential risk for the fund.
- Early termination may be exercised by the bank – in which case the fund will lose its hedge and will need to replace this with another –perhaps at worse terms
- Operational risk associated with such a complicated structure is quite high (ie mark to market, margining process)
- Future changes in banks (or pension funds) risk and capital requirements may require derivative to be unwound or reset on disadvantageous terms
- May require ongoing monitoring of the swap in order to maintain the hedge

iv.

- LDI manager has experience (and scale) in running a range of LDI strategies
  - This will minimize operational risks associated with complexity of underlying instruments
  - Reduce credit and legal counterparty risk associated with dealing with a single bank (a more strenuous due diligence process would be followed)
  - Possibly allow the assets to be structured in a way which more closely matches the liabilities
  - Also more actively managed and monitored on an ongoing basis whereas the bank will be more of a buy and hold strategy. Changes in liabilities,

demographics, politics, regulation and market conditions or relative pricing between physical and derivative investments argue for a more flexible or dynamic approach
    - May be able to incorporate a mortality hedge within the strategy which would be more cumbersome with a bank swap.
    - May have access to credit which can be implemented into the portfolio thereby enhancing returns
    - The additional manager overlay will come at an extra costs
    - But this may be countered by stronger negotiating power with banks and other counterparties
    - An additional governance overlay would need to be put in place with respect to the LDI manage
    - Due diligence selecting the right manage
    - Manager performance will need to be measured – this is complex as what benchmark is appropriate
- Doing a deal directly with the bank may be cheaper but will still require a governance overlay
    - Would need to train someone "in-house" to manage the swap (collateral etc) – possible higher operational risk
    - This would involve someone closer to the fund who may apply a higher level of care, but
    - Would this be worth it for a decreasing liability (since the pension pool is closed)
    - May need to consider more than one bank
- It may be quite easy to change LDI managers if you are not satisfied with performance

v.

- A repo is a repurchase agreement - an agreement to sell an underlying asset and buy it back at a fixed date in the future, at a pre-determined price.
- They could Repo existing bonds held by the fund and being using to match liabilities and then use the cash they receive to buy the shorter dated credit.
- Most repos do not loan the full value of the bonds sold but apply a "haircut" so you would not get the full value of the bonds sold.
- The fund would then get the total return on the shorter dated credit bonds, less the difference between the repo rate and the purchase price of the credit
- Would need to have cash available for the haircut and to pay the margin
- Repos are for three months while the credit bonds will be for a longer term (3-5 years). This would mean that repos would need to be rolled over every three months
- Will be rolling over at unknown terms
- May not be able to roll over if cannot find a counterparty, in which case you will need to settle cash which will require a quick sale of underlying assets.
- Credit risk is associated with the repo counterparty
- Is the credit "pick-up" on the credit enough to compensate for the additional risks and costs