EXAMINER'S REPORT

November 2018 exam

Subject F105 — Finance and Investment Fellowship Principles

INTRODUCTION

The attached report has been prepared by the subject's principal examiner. General comments are provided on the performance of candidates on each question. The solutions provided are an indication of the points sought by the examiners, and should not be taken as model solutions.

QUESTION 1

i.
- It refers to the authority given by the owner of investments to the investment manager whom they employ to manage their investments, i.e. acts as a business contract between the owner of the investments and the investment manager

ii.
- The extent to which the manager is allowed to depart from the benchmark strategic allocation of assets to foreign bonds
- Limits on credit ratings, e.g. nothing below a BB rating
- Limits on how much corporate versus sovereign to have in the portfolio
- Limits on maximum exposure to individual assets or counterparties. This may vary by term and credit rating
- Requirement to adhere with any relevant regulation regarding pension fund investments
- Limitations on overall duration of portfolio – possibly an overall duration range that the portfolio must maintain
- Restrictions on investing in certain countries (possibly due for currency outlook reasons or due to political risks) or companies
- Limits on use of derivatives or short-selling
- Limits on use of other interest-bearing-like instruments such as convertibles, etc.
- Other ethical or social limitations
- Limitations on industry for corporate bond holdings
- Limitation on developed vs. emerging market holdings
- Limitations on nominal vs. real bond exposures
- Requirement to consider ESG factors (e.g. not investing in arms or tobacco, targeted social upliftment, etc.)
- Liquidity restrictions – this can be limited by requiring certain issue sizes, or listed only

iii.
- The aims of regulation are to:
  - Promote efficient and orderly markets
  - Protect consumers of financial products, i.e. the members of the pension fund
  - Maintain confidence in the financial system
- Investing in foreign bonds exposes members to the risk of currency fluctuations if liabilities are local.
- Foreign bonds also exposes members to credit risk.
- If a disproportionate level of assets are allocated to one asset class, it creates concentration risk.
- Therefore the regulator may restrict foreign bond investment to manage exposure to, and limit losses from, these risks.

- Significant pension fund losses will damage confidence and adversely affect the willingness to save for retirement through these vehicles.
- Given that pension funds typically constitute a large proportion of assets under management, the protection of these funds are imperative to the systemic stability of the local financial system.

Examiner's comments:

i.   *This was direct bookwork but a large proportion of candidates only explained that the mandate provided the limitations and guidelines to the manager. This is just a subsection of a broader legal agreement giving the manage authority to act on behalf of the investor.*

ii. *There were far more points that could have been raised than the marks available. Yet candidates did not use this opportunity and wrote too little for the number of marks awarded. Currency hedging and liability matching were frequently brought up but do not apply to this specific scenario or type of mandate. Candidates are to recall that one of the main reasons for investing offshore is to get exposure to different economies and currencies.*

iii. *This was quite well answered by most candidates.*

QUESTION 2

i.
- The investor will want to maximize after-tax retirement income.
- The tax credits he receives while working will influence the level of contributions he decides to make into the RSV relative to direct investment in ETFs.
- The payment of tax on returns earned by the RSV is delayed to retirement. This makes it more attractive than option B.
- The level of tax charged on benefits received from the RSV during retirement relative to the tax charged on returns earned on direct investments in ETFs will influence the relative attractiveness of the RSV versus a direct investment in ETFs.
- If losses or gains on direct investments in ETFs can be aggregated or tax deducted at source can be reclaimed, the attractiveness of option B might improve.

ii.
Framing –
- Framing the guarantee relative to money market would have encouraged the investor to invest in the product.

Overconfidence –
- If some initial investors have received their promised returns, then hindsight bias will reinforce overconfidence as the meeting of promised guarantees would have been considered predictable.

- The investor is probably displaying confirmation bias by agreeing with those praising this product, and ignoring any opposing views and warnings.

Myopic loss aversion – this relates to investors' aversion to short-term losses
- The investor may prefer the guarantee to other investments not offering guarantees although he should not have to be concerned about short-term losses since he is saving for retirement which is 20-years away.

Regret aversion –
- the investor wants to avoid the negative experience of regret if others receive the promised returns and he has lost out.

Anchoring –
- the returns promised by the scheme were anchored relative to the money market rates, and compared very favourably to these, despite money market not being an appropriate benchmark for a long-term (20 year) investment.

Prospect Theory –
- if the investor has recently made a loss, and/or is behind the retirement savings target, he/she may become risk-seeking and find this high-return investment attractive.
- Alternatively if the investor is ahead of target, he/she may become risk-averse and find the guarantee offered attractive.

[Credit for any alternative biases provided reasonable support is provided]

Examiner's comments:

Overall this question was answered reasonably well due to good marks in part (ii) offsetting low marks for part (i).

i.   *A great number of students simply restated the information in the question without adding any insight. An equally great number of students wrote about the contributions, returns and benefits separately, without giving any insight on the combined effects e.g. "Option A is better due to tax deductible contributions, and tax-free roll-up. Option B is better after retirement." A number of students wrote that "Option A is better" without considering situations where it might not be. Few students considered that different tax rates might apply before/after retirement. Few students thought of deductibles and allowances that might make Option B better. A number of students wrote about non-tax related issues e.g. "Access to funds is better under Option B."*

ii.   *This part was well answered by most students.*

QUESTION 3

i.
Let the principal be *L=100*.

We consider a swaption under which Interest Bank pay $R_X = 9\%$ and receive the floating rate. The swap will last n=3 years and starts in T=2 years. There are m=2 payments per year.
Value as a call option.

Assume that the swap rate in T=2 years' time is lognormally distributed. (given)

Swaption value formula: $\frac{L}{m}\sum_{i=i}^{mn} P(0,t_i)\left[F_0\Phi(d_1) - R_X\Phi(d_2)\right]$
Where $F_0 = 8\%$ is the forward swap rate.

$d_1 = \frac{\ln\left(\frac{F_0}{R_X}\right)+\frac{1}{2}\sigma^2 T}{\sigma\sqrt{T}} = \frac{\ln\left(\frac{0.08}{0.09}\right)+\frac{1}{2}\times0.2978^2\times2}{0.2978\sqrt{2}} = -0.06909$ and $d_2 = d_1 - \sigma\sqrt{T} = -0.49024$,
leading to $\Phi(d_1) = 0.47246$ and $\Phi(d_2) = 0.31198$.

The half-annual effective rate on the yield curve is 4%. The annuity factor is then

$$\left(1+\frac{0.060908}{2}\right)^{-1}\left(1+\frac{0.06}{2}\right)^{-1}\left(1+\frac{0.068136}{2}\right)^{-1}\left(1+\frac{0.073326}{2}\right)^{-1}\left(\frac{1-v_{0.04}^6}{0.04}\right)$$
$$= 0.87892 \times 5.242137 = 4.6074$$

The swaption value $= \frac{100}{2} \times 4.6074 \times [8\% * 0.47246 - 9\% * 0.31198] = R2.2389m$

ii.
- The swaption is an option to pay 9% and receive floating.
- The payoff is equivalent to paying a coupon rate of 9% plus nominal on a 3-year bond in exchange for receiving the floating rates plus nominal on a 3-year bond, which is just equal to the nominal value of the bond.
- Therefore, this is a put option
- …on a 9% fixed rate bond.

iii.
Boring can
- Enter into a swap, paying fixed and receiving floating
- Buy an interest rate cap
- Buy interest rate futures, with expiries over the term of their FRN
- Enter into a series of FRA's

Examiner's comments

i.   Candidates struggled with the interest derivative calculations. A handful of candidates were however able to score full marks. Most candidates wrote down the right pricing formula, but many struggled with the exact payment dates of the cashflows under the swap agreement and subsequent discounting thereof. Candidates also struggled to

distinguishing between forward and zero rates. Some confused the value of T used in the calculation of d₁ and d₂ as the length of the period that payments are made upon exercise of the option (i.e. 3 years), instead of being the number of years from inception to the option exercise date (i.e. 2 years).

ii.   *Many candidates had the right idea, but only a minority managed to explain the logic behind their idea to score full marks.*

iii.   *This was reasonably well answered but there was a good spread of marks.*

QUESTION 4

i.

- The investment bank is exposed to the risk of the insurance company defaulting on the payment of coupons and principal.
- This risk however is mitigated to an extent since the insurance company is rated AA and hence likely to be financially sound and well-funded to meet its obligations under the EMB.
- Since the investment bank has purchased the full issue, the full insurance risk is being transferred to the bank (up to the nominal value at risk) thereby creating concentration to a single insurer.
- The insurance risk is also not shared among several investors and exposes the bank to a single type of insurance risk for a significant period of time (5 years) i.e. concentration to a type of insurance risk (mortality risk).
- Since the security is a single issue, this limits the marketability of the instrument, thereby presenting the risk that the bank may not be able to find a willing buyer should they choose to reduce their insurance risk exposure going forward.
- The above would be further limiting, if the bank does not have an option to call on its principal prior to the redemption date.
- The bank is at risk of losing all of its principal should the mortality index increase significantly.
- Given that the coupon structure is floating, it exposes the bank to the risk that interest rates could fall and thereby lead to a return on the loan that is not commensurate with the risk assumed.
- Worse mortality experience observed by the insurance company compared to changes in the mortality index may increase the risk of insolvency of the insurer and therefor the credit risk on the bond.
- The investment bank may not have the insurance expertise to understand the extent of the insurance risk it faces, and therefore this presents the risk that the floating coupon or margin above any floating rate may be incorrectly priced for the uncertainty faced by the investment bank.
- The insurance risk is even harder to understand given that a risk event is based on a move in the worldwide mortality-index rather than the insurer's own mortality experience.

ii.

In order to reduce the default risk faced, the insurance company needs to meet specified minimum financial criteria which can include:
- A minimum solvency level
- A credit rating above a certain level e.g. A and above
- Upper limit on dividend payments over the period of the bond
- Minimum level of liquidity in order to ensure that coupon payments on the bond can be serviced
- No further borrowings to be undertaken
- [any other appropriate financial covenant] – Max 2 marks

Other covenants / restrictions that can also be put in place:
- Restrictions on the issuance of further EMBs (restrictions may be applied on number / size / insurance risk covered]
- The requirement to have an SPV set up for the purposes of the EMB
- To have the mortality index formally reviewed by an independent party for ongoing appropriateness to the underlying life insurance book – to ensure that the nature of the transaction aligns with the investment banks understanding of their exposure.
- Introducing a waiting period to allow for a delay in the adjustment to the index from changes in mortality rates

[any other appropriate restriction] – Max 2 marks

Examiner's comments:

Overall this question was answered less than satisfactorily. Many candidates made the assumption that the bond was issued by a special purpose vehicle while the question doesn't state this.

i. *Many students were able to mention the more obvious risks, but failed to use the information provided to come up with additional risks.*

ii. *Candidates are reminded that the command word "list" only requires brief points to be made. If the restrictions mentioned in part (ii) could be linked back to the risks mentioned in part (i), marks were awarded. Many candidates listed points on how the mortality experience of the insurer could be improved. Unless candidates indicated how this indirectly reduces credit risk exposure for the bank, raising these points suggested that candidates did not understand that the mortality risk exposure of the investment bank was not directly linked to that of the insurer.*

QUESTION 5

i. Rationale:
- Commodities provide significant diversification and other benefits:
    - Returns accrue to investors without the need for active management

- o Commodities offer a package of diversification benefits unlike any other asset:
    - In those environments that have produced the worst results from financial assets (rising inflation, excessive global demand and supply disruptions) commodities have produced higher returns than any other asset class.
  - o Unlike other asset classes, commodities are concerned with short-term supply and demand and short-term risk.
  - o Returns are based on real underlying economic work within the economy.
  - o Returns show low correlation with other assets in institutional portfolios.
  - o Investors may believe that they will provide superior returns to other asset classes.
  - o Some commodities like gold can be seen as a safe haven in times of economic turmoil.

ii. Key issues include:

- The level of interest in the index and derivatives to be based on it:
  - o Potential users include investors, speculators and hedgers (although the latter might be more interested in single asset derivatives).
  - o If interest is very low, it will lead to low levels of liquidity in the derivatives making it unviable.
- Consider alternative uses of the index that will influence level of interest in it
- The likelihood of the index being needed for benchmarking and for fund manager performance assessment:
  - o This requires the index to be replicable and acceptable (e.g. it needs to be adequately diversified to meet investor needs).
- The likelihood of being used as a measure of short-term market movement impacts number of commodities to include and frequency of calculation
- The difficulty of deciding how to compile the underlying basket of commodities:
  - o Criteria for inclusion/exclusion of various commodities
  - o Criteria for weighting
- Practical issues need to be resolved:
  - o Frequency of updating index constituents and weights
  - o Frequency of calculation of index values
  - o Assumptions and allowances in calculating an index e.g. tax
  - o How index values will be made readily available
  - o Sources and availability of data
- Transparency - the calculation and management process must be transparent and well understood for acceptance of the index.
- Whether a series of sub-indices is required based on the main types of commodities e.g. precious metals, base metals, agricultural etc.
- The cost implications and expertise required by the stock exchange to develop and maintain the index

Examiner's comments:

Overall this question was reasonably well answered, and the main challenge for students was coming up with enough points. In part (ii) in particular, students could have made a wide-range of points, however answers tended to be focussed on only a few key issues.

QUESTION 6

i.
- Vertical mergers are those involving companies engaged in different stages of the production process.
- Merged, the new company spans (and controls) a greater part of the process from raw materials to the final consumer.
- …In this way, co-ordination and administration can be improved.
- Equally, access to complementary resources may be improved.
  [1 mark for motivation]

ii.
- <u>Operating leverage</u> = (sales - variable costs)/(profit before interest & tax)
  No-acquisition: 85/25= 3.4; *Post-acquisition*: 180/80=2.25
  Modest reduction. The post-acquisition company is less sensitive to changes in sales, suggesting lower risk to bondholders.

- <u>Financial leverage</u>: (interest payments)/(profit before interest & tax)
  No-acquisition: 5/25 = 0.2; *Post-acquisition:* 20/80=0.25
  Significant increase. Although the company's profits are expected to increase post-acquisition, the proportional increase in debt interest post-acquisition is higher. The company is therefore less certain to repay interest to debtholders if they merge.

- <u>Capital leverage:</u> debt/equity
  No-acquisition: 50/50 = 1; *Post-acquisition:* 200/200=1
  By book values, debt and equity are expected to be equal whether the acquisition takes place or not, giving a ratio of 1 in both cases. This represents high gearing, but this picture is incomplete.

  For the purpose of loan security, intangibles can be removed, so that the post-acquisition debt/equity ratio is 200/140=1.43, which represents a significant deterioration for debt holders.

- <u>Liquidity:</u>
  Current ratio = current assets / current liabilities
  No-acquisition: 170/70=2.43; *Post-acquisition*: 260/20=13

      Alternatively,
  Quick ratio = current assets excluding inventory / current liabilities
  No-acquisition: 100/70=1.43; *Post-acquisition*: 170/20=8.5

The post-acquisition firm is expected to have a much improved liquidity position, reducing the risk of it not being able to meet its current liabilities and thereby reducing the risk to bondholders of not receiving their interest payments. With such high current assets, Able should be able to get short-term bank funding, which can reduce its long-term debt, improving capital ratios.

- Return on equity: profit/net assets
  No-acquisition: 20/50x100=40%; *Post-acquisition*: 60/200x100=30%
  A reduction in the ROE will be perceived as negative by shareholders and could possibly lead to a reduction in share price and make it more difficult to raise further capital in future.

  EBIT/Assets
  No-acquisition: 25/170x100=14.7%; *Post-acquisition*: 80/420x100=19% or 80/360x100=22.2%
  Higher return from assets would be positive for bondholders.

- If further expense savings could be realised from the improved efficiency of the merged companies, an increase in operating profit would improve the financial leverage and return on equity ratios. This would reduce the risk of debt holders not receiving their interest payments.
- Able Stores wants to pay a premium (goodwill) of R60m for FurnFact. Debtholders will want some assurance that this premium is justified:
  - Goodwill is an intangible asset that is unlikely to be realisable in the event of distress.
  - If goodwill reflects superior sales growth in future, this could reduce risk for debtholders.

Any other relevant point made from the information provided specifically as it relates to bond holders.

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iii.
- Able Store is a cyclical company
- …and its share price relative to the rest of the market will therefore depend on the current state of the economy.
- As the economy starts to move into recession, the PER of Able Stores is likely to fall
- …as the market anticipates a drop in future profits.

Examiner's comments:

i.   This was a straightforward bookwork question. Most candidates did well.

ii.   Most candidates calculated sensible ratios (e.g. capital and income cover), but many missed the opportunity to get a more well-rounded picture of the accounts by calculating further ratios. Candidates generally commented on the basics. A minority of candidates commented on useful funding changes that could be made, and how this would impact bondholders.

iii.   This was a straightforward bookwork question. Most candidates scored full marks.

QUESTION 7

i. Key characteristics:
   - Companies in this group tend to be capital intensive
   - Banks are highly geared and have volatile profits
   - General insurers also have volatile profits and virtually no borrowings.
   - Life insurers have stable profits and low gearing.
   - Labour costs are important for many companies in the group.
   - Companies often operate under considerable regulation (due to potential information asymmetries, complexity of products, long-term obligations and potential for fraud and mismanagement).
   - The domestic market is most important but there in increasing internationalisation.

ii. Time weighted rate of returns:

- Fund performance:
   - Value portfolio TWRR: = [(265/200)*(175/(265-75))]^(1/3)-1 = 6.86%p.a
   - Growth portfolio TWRR: = [(565/400)*(380/(565-75))]^(1/3)-1 = 3.08%p.a
   - Fund TWRR = [(830/600)*(555/(830-150))]^(1/3)-1 = 4.13%p.a.

- Benchmark performance:
   - Value benchmark TWRR: = [140/120]^(1/3)-1 = 5.27%p.a.
   - Growth benchmark TWRR: = [195/170]^(1/3)-1 = 4.68%p.a.
   - Benchmark TWRR = [0.5*140/120+0.5*195/170]^(1/3)-1 = 4.98%p.a.

iii. Performance attribution:
- The underperformance from (ii) is 4.13% - 4.98% = 0.85% p.a.

- For stock selection effect, calculate fund values based on actual style decision, and benchmark stock returns. Hence fund values:
  - $Fund^C_1 = 600$
  - $Fund^C_2 = 200*(155/120)+400*(235/170) = 811.27$
  - $Fund^C_3 = 200*(140/120)+400*(195/170) - 75*[(140/155)+(195/235)]=562.18$
- FundC TWRR = $[(811.27/600)*(562.18/(811.27-150))]^{(1/3)}-1 = 4.75\%$p.a.

- Hence stock selection performance is = (4.13% p.a. – 4.75% p.a.) = -0.62% p.a.
- Hence style decision performance is = (4.75% - 4.98%)=-0.23% p.a.

- Alternatively, calculating style selection impact first will yield slightly different results:
  Stock selection performance = 0.02% p.a.
  Style selection performance = -0.86% p.a.

iv. Comments:

- For the period under review the manager was not able to beat the benchmark, and underperformed on both the style allocation and stock selection decisions. This performance does not support the manager's claim.
- It is not clear if performance is before or after fees – if the former, then underperformance is even bigger than as calculated above.
- If the investor's intention is to beat the overall market, then the benchmark should be based on a broad market TRI – it might be the case that the manager did in fact beat the overall market, however this could not be verified from the data given.
- The TWRR for the Value and Growth portfolios shows that the Value team beat the Value TRI, however this positive stock selection effect was undone by the Growth team.
- The decision by the manager to allocate a smaller portion of the portfolio to the Value team is the reason for the Style allocation underperformance.
- The three year period is too short to evaluate manager performance – a longer period is necessary to evaluate whether this experience is due to luck or skill (or lack of skill).
- An evaluation of performance should include an assessment of risk taken – e.g. was the excess return from the Value team accompanied by excessive risk.

Examiner's comments:

Overall this was not done well.

i. *This question was bookwork and most students did well.*

ii. *This asked for a straightforward performance attribution, but few students did this correctly. There was quite a large variation in the type of errors, from careless computational errors to fundamental methodology errors. A worrying number of students*

confused their fund and cashflow values with index numbers (deducting the cashflow from an index number in calculating a return). When students use shortcuts, they need to be very careful that their underlying assumptions are correct, in particular when calculating a portfolio return based on a weighted average of component returns. The presence of cashflows (as in this case) is likely to invalidate shortcut approaches.

iii.   *Credit was given based on results obtained in part (ii). However, students need to realise that credit will not be given for statements of the obvious, e.g. writing out in full that the manager did not beat an index, or that the manager produced a negative stock selection result, if this is obvious from the calculations in (ii). Students were expected to provide some interpretation to the results obtained in (ii).*

QUESTION 8

i.
- Market/Interest rate risk:
  - The bond price is inversely related to changes in interest rates. The liabilities are discounted at the return earned on assets and also has an inverse relationship with interest rates.
  - However, there is a risk that the value of assets and liabilities will not change by the same amount when interest rates change causing a decrease in funding level if interest rates fall.
- Inflation risk:
  - The risk that actual inflation rate is higher than assumed. This will cause the liability to grow by more than the value of the underlying asset as the bond is nominal.
- Re-investment risk:
  - The bond matures in 4 years whereas there is still a liability payment due at the end of year 5. The asset proceeds received at the end of year 4 in respect of the liability payment due at the end of year 5 creates a re-investment risk.
  - If the proceeds can only re-invest at a lower rate this will cause a deficit to arise.
  - To the extent that the timing of coupons and liability payments do not match re-investment risk is increased.
- Credit risk:
  - If the bond issuer defaults on his obligations the institution would need to source the necessary funds to meet its liabilities.

Note: Interest and inflation risks are two sources of asset-liability mismatch risk.

ii.
- Assets are chosen in such a way that it performs in the same way as liabilities.
- Protection from unpredictable changes in factors that affect liability values.

iii.

- Duration of ILB A:

$$\frac{\sum_{i=1}^{5}3.75\times\left(\frac{1.0725}{1.05}\right)^{-i}\times i+100\times5\times\left(\frac{1.0725}{1.05}\right)^{-5}}{\sum_{i=1}^{5}3.75\times\left(\frac{1.0725}{1.05}\right)^{-i}+100\times\left(\frac{1.0725}{1.05}\right)^{-5}}=\frac{501.77}{107.54}=4.67$$

- Duration of ILB B:

$$\frac{\sum_{i=1}^{4}2\times\left(\frac{1.0725}{1.05}\right)^{-i}\times i+100\times4\times\left(\frac{1.0725}{1.05}\right)^{-4}}{\sum_{i=1}^{3}2\times\left(\frac{1.0725}{1.05}\right)^{-i}+100\times\left(\frac{1.0725}{1.05}\right)^{-4}}=\frac{386.25}{99.46}=3.88$$

iv.
- The inflation risk is hedged to a greater extent by investing in either ILB compared to the current fixed interest bond.
- ILB B will expose the investor to re-investment risk at the end of year 4, while the term of ILB A matches that of the liabilities. However, any mismatch in terms of coupon sizes and liability cashflows on either bond will still be a source of mis-match risk.
- The duration of ILB A (i.e. 4.67) is closer to the duration of the liabilities (i.e. 4.47), than the duration of ILB B (i.e. 3.88).
- This means that by investing in ILB A rather than ILB B, the value of the assets will behave more similarly to the liabilities if interest rates change, making ILB A a better hedge than ILB B.
- Since the company is currently underfunded, i.e. only R105.89 million worth of assets are available to meet a liability of R110.01 million, some mis-match risk will remain whether either of the ILBs are purchased.

Examiner's comments:

This question as surprisingly poorly answered for a straightforward application of immunization.

i. *Candidates listed the generic investment risks facing investors without explaining these in the context of the question. For example, many put down "relative performance risk" which would not be relevant in this situation as the strategy is to hedge a liability and not maximize performance subject to risk. Many also referred to the assets not being sufficient to meet the liabilities but did not explain how this risk would arise in this situation.*

ii. *Students performed poorly for a direct bookwork question. A common mistake was to provide a definition of cashflow matching rather than liability hedging.*

iii. *The calculation of duration was poor and many did not attempt it at all. This is a pity as this was three easy marks to score.*

iv. *A large number of students wrote that the bond of lower duration is appropriate. This only applies if interest rates increase, but what happens if interest rates fall?*

QUESTION 9

i. It is the annualised standard deviation of the difference of portfolio return and benchmark return based on the observed historical performance.

ii.
   a.
   - Strategic risk is the risk of poor performance of the strategic benchmark relative to the value of the liabilities.
   - Strategic risk may reflect both the risk of the matched benchmark relative to the liabilities and the risk taken by the strategic benchmark relative to the matched benchmark.
   - E.g. the trust's strategic asset allocation strategy only allocates 55% of assets to inflation linked bonds, while the long-term proportion of the student scholarship liabilities to total assets, which can be matched using these bonds, is 70%.

   b.
   - Active risk refers to the risk taken by the asset managers to whom funds are allocated in deviating from the strategic benchmark given to them.
   - Exposure will depend on the asset managers stock and asset selection decisions.
   - E.g. the tracking error on the bond portfolio is at 5% p.a., which implies that the bond manger is allowed to deviate from the benchmark position in the aim of generating extra returns.

   c.
   - This refers to the risk associated with any mismatch between the aggregate of the portfolio benchmarks and the total fund benchmark.
   - This would arise when a fund uses multiple asset managers, each of whom is allocated a strategic benchmark.
   - E.g. if all of the funds are allocated to the bond and equity managers to manage and no manager for the cash portion is allocated.

iii.
- Reducing the strategic risk budget will entail making changes to the fund's strategic asset allocation strategy so that it more closely aligns with its liabilities.
- This will entail increasing its exposure to inflation linked bonds by 15% by possibly reducing its exposure to equity by 15%.
- If these changes are to be implemented immediately, the following difficulties are likely to be experienced:
    o Bond and equity prices might be shifted as a result of this.

- o It might take time to affect the sale of equities and purchase of bonds especially if either of those markets are illiquid.
  - o Difficult to make sure the timing of the deals is advantageous. I.e. equities might be sold at a reduced price if equity market is not marketable or in a bear market; bonds might be expensive at present.
  - o Dealing costs could be considerable.
  - o Crystallisation of capital gains can lead to a tax liability.
- By taking a long futures position on a contract based on the IGOV index,
- …and a short futures position on a contract based on the ALSI, a synthetic portfolio can be created.
- By using the right number of futures contacts, the same exposure to the equity and bond markets compared to an actual rebalance in the cash markets is possible.
- The bonds can then be purchased and equities sold over an extended period of time.
- This gives more time to buy bonds and sell stocks when prices are considered to be more favourable,
- … and give more time to carefully select which stocks to sell and bond to buy.
- By delaying the sale of equity, the possible tax liability can be delayed, and possibly be moved to a year when the overall tax liability will be less.

iv.
- Straddles are used for speculative purposes.
- A straddle entails buying a put option and a call option on the same underlying assets with the same exercise price and expiry date.
- The investor will make a profit if the share prices move by more than the premiums paid for the two options relative to the strike price.
- It is therefore purchased when the share price is volatile.
- It would therefore not be appropriate to reduce active risk.

v.
- The active money position of a stock is the difference between the portfolio holding and the benchmark holding of that stock.
- If all the active money positions are zero, then there is no difference between the proportions of funds allocated to each stock in the fund compared to the weights of each of those stocks in the ALSI.
- The fund is therefore being run like an index tracking fund.
- Therefore the fund wants to move from an active to a passive management style.
- The asset manager will take no active management decisions.
- Rather they will aim to replicate the performance of the ALSI going forward.
- This will be done either through holding all of the shares in the index in the appropriate proportions
- …or through using sampling techniques,
- …or by synthesizing the index using derivatives.

Examiner's comments:

In general this question was fairly poorly answered. Candidates are encouraged to read the question carefully and to use all details provided in their answers.

i.   *This was well answered, as would be expected for a bookwork question.*

ii.   *It cannot be stressed enough that answers should be tailored to the scenarios presented. The examples given in this question should have been specific for this case.*

iii.   *Many candidates said that using futures reduces the overall transaction costs. However, the actual transactions in the cash market will still take place. The transaction costs will therefore only be spread out over a period of time when futures are used. Some also said that the tax liability on realised capital gains will be avoided. Again, since the actual sale of the stocks will take place, the incurrence of a tax liability will simply be delayed or may be reduced.*

Candidates were not specific enough in their answers. The scenario presented makes it clear that the exposure to inflation linked bonds needs to be increased. Yet, many candidates simply said that a change to the strategic assets allocation strategy will be needed to reduce strategic risk.

iv.   *Active risk does not have to do with underperformance per say. Rather, it is the risk that the performance of the asset manager is different to that of the benchmarks allocated to them. Buying options will not reduce the risk taken by an asset manager in diverging from the benchmark strategy. Straddles are therefore not appropriate to manage active risk exposure.*

v.   *Most candidates recognized that reducing the active money positions implied a move to a passive strategy but failed to raise enough points to gain full marks. The question specifically asked for the implications to the management style. Reference to cost differences or the appropriateness of the current manager is therefore not relevant.*