

# **EXAMINERS' REPORT**

*November 2022 examinations*

## **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.

- The merged life insurance company would benefit from economies of scale,
- such as sharing core services like marketing activities (or any other relevant example)
- and spreading the fixed cost of management staff and IT systems over a larger level of business written.
  
- There may be opportunities to cross sell products across the two sets of policyholders or to use shared distribution
- thus increasing market share.
  
- There could be diversification benefits if the policies written by the insurers are complimentary,
- for example, the mix of annuity and insurance exposure and/or geographical location of the insurance books.
  
- Another reason may be that the larger organisation is able to source more competitive terms
- for example, from its reinsurers
- and therefore increase competitiveness.
  
- Another financial motive may be a tax loss carry-forward if one of the insurers has sustained a recent tax loss
- The merged insurer is less likely to be taken over by competing insurers that remain
- A more aggressive motive may be to eliminate inefficiencies (including underperforming management).
- Earnings per share may be enhanced
- and dividend paying potential increased
- The merger may improve the security of accrued liabilities
- and reduce the need for additional capital support.
- It may also improve the regulatory position.
- A larger firm will find it easier to obtain and maintain a credit rating and/or a reduced cost of borrowing

ii.

a.

- The regulator would assess whether the combined market share of the newly formed company creates market power
- With SolidRock not growing much of late, their market share of new sales is relatively small
- SolidRock and Banana are probably servicing different and complementary markets
- the regulator would likely not prevent the merger

b.

- SolidRock seems to be a value company, with low growth and high capital values.
- The newly merged company is less likely to adhere to the characteristics of a value company
  - The value investor is likely to reduce their holding in SolidRock

- c.
- With a low pay-out ratio, and high growth, investment returns from Banana are likely mostly in the form of capital growth, rather than income
    - Banana would therefore appeal to the fund
  - The newly merged company might have a higher dividend yield, making it less appealing to the fund
    - The fund might reduce their holding
- d.
- An event-driven hedge fund might buy one of SolidRock and Banana and short sell the other one.
    - If their view of the offer to Banana differs from the market
  - The fund would hope to profit from their position once the market moves in agreement to their view, and then unwind their position
  - *other relevant points in line with those above were accepted (up to a maximum of 1.5 marks) if a different hedge fund strategy was chosen by a student.*

***Examiner comments***

*The majority of the points made in (i) were in line with the bookwork contained in the notes. Students needed to apply their points to the question in order to do well, as the question specifically referenced life insurance companies. The students largely understood the question, however many failed to score well by failing to generate a large enough number of distinct (and applied) points.*

*A wider range of points were made by the students in 1(ii), and the performance per sub-question (across a., b., c., and d) varied across the scripts, with some students significantly misunderstanding some of the sub-questions. This reflects the slightly more applied nature of 1(ii). Appropriate responses, in line with the memo, received appropriate credit.*

**QUESTION 2**

- i.
- Prescriptive statutory regulation, since detailed rules are provided in terms of what portion of assets may be invested in a particular asset class.

ii.

Direct costs:

- A direct cost is incurred by the regulator in administering the regulation.
- Insurers will also incur a direct cost in ensuring compliance (e.g. putting systems and processes in place to ensure that the limits are not breached; ensuring that the marketing of the product complies / fully discloses and apply these restrictions).
  - These costs of compliance will ultimately be borne by investors/policyholders.
- Investment restrictions could reduce investment returns earned for policyholders as more aggressive strategies that are likely to generate higher returns may be prohibited.

Indirect costs:

- There may be a reduction in consumer protection mechanisms developed by insurers.
- If regulatory restrictions are such that they lead to unattractive savings products, insurers will not be able to sell them, which may lead to lower savings by individuals and greater reliance on the state (e.g. in retirement).
- Advisors may take reduced responsibility for ensuring the risk exposure of products needing to comply with the regulations are appropriate for their clients, with the regulations producing a false sense of security.

*(no marks for 'stifled product innovation' or 'reduced competition'.)*

iii.

*(first two points are marked)*

- To protect consumers of financial products: If a cap on more aggressive asset classes is not in place, insurers may opt for more aggressive investment strategies and policyholders be exposed to a greater risk of making losses on their savings policies or of suffering higher volatility of returns.
- To maintain confidence in financial system: Confidence in insurance companies may be damaged if proceeds on policies are poor from poor investment performance, if more risk was assumed in the choice of investment strategy.
- As a means of exchange control: to control the outflow of funds.

iv.

- Expected returns and overall riskiness of the portfolio will change, affecting existing policyholders.
- It may lead to withdrawals by existing policyholders if risk/return profile of the product does not meet their needs.
- ...but may also attract new policyholders.
- The attractiveness of the product relative to offerings by other insurers will be affected.
- The change, and its impact will need to be communicated to existing policyholders.
- Transaction costs will be incurred and borne by policyholders in making the change.
- Capital gains may be crystallised and a tax liability incurred from the sale of the building.
- Capital losses may be crystallised from the sale of the property particularly if there are challenges in finding a buyer for the building.
- Liquidity of the portfolio will be improved as an illiquid asset is exchanged for more liquid equity.
- The portfolio's exposure to currency risk will be increased.
- Suitable equities will need to be identified and bought.

*(no mark for increased diversification, as this is not necessarily the case)*

v.

- It may take time to sell the building and arrange matters associated with a change in ownership (e.g. tenant contracts).
  - Through longing futures on an offshore equity index, immediate additional exposure to offshore equity can be obtained without having to trade in the cash market.
- A better price may be gained for the building if there is more time to sell it.
- More time will be gained to identify which stocks to buy.
- Capital gains tax on crystalized gains from the sale of the building can be delayed.
- Basis risk will be introduced when using futures rather than buying the stocks in the cash market.
- If offshore equities fall in value, other assets may need to be disposed of to settle any margin calls.
- Reducing local property exposure can be achieved through taking a short position on a local property future (based on an index or large unitised fund/ REIT), if available
  - However, it is unlikely that a suitable futures contract would be available to hedge the sales price of the building.
  - An alternative might be a forward contract, if a counterparty can be found
  - Any futures/forward contract is likely to be based on a listed property index / REIT, and would introduce significant cross hedge risk.

vi.

- If the view is held that stocks within a sector are correlated and that the biggest difference in performance comes from industry or country allocation, then a top-down approach could be the more appropriate approach.
- ...However, if one holds the view that all performance starts with the performance of individual stocks and that it is more important to therefore first start with the stock selection decision, then a bottom-up approach might be more suitable.
- A top-down approach, by ensuring a specific spread across industries and counties, is likely to result in a more diversified portfolio.
- ...Because a bottom-up approach only considers individual securities, it might lead to a more concentrated portfolio.
- Greater expertise might be requited in a bottom-up approach if individual securities across various countries and industries are to be evaluated compared to a top-down approach which starts at a higher level and give consideration first to macroeconomic expectations.
- A bottom-up approach could deliver superior returns if there is a particular sector that is expect to perform really well, but the top-down approach limits investment in that sector.

### ***Examiner comments***

- i. *Most candidates were able to correctly identify the form of regulation.*
- ii. *Most students could identify the direct costs, but more struggled with identifying the relevant indirect costs. A penalty for not complying with the regulation cannot be seen as a cost of regulation!*
- iii. *Only the first two response were marked. The concern for the regulator with savings products would be more to protect consumers from poor outcomes than the insolvency of the insurer (unless there are explicit guarantees offered). Many candidates stated increased diversification as a motivation for regulation but the regulator is probably only*

concerned about over exposure to risky asset classes and hence not diversification in all circumstances.

- iv. Candidates should use the details provided in the question to formulate their answers. Mention of a mismatch risk is not appropriate since this is a market linked product. Some candidates also spoke of guarantees, but the question says nothing about this.
- v. This question was less well answered. Many students focused on hedging benefits to using forwards. But the purpose here is assisting with the transition, i.e. to gain exposure immediately without having to trade in the cash market. This strategy does not reduce trading costs, because ultimately the transaction will need to be carried out in the cash market. Candidates spoke about moving market prices if large transactions are made. But the question does not indicate that this is a large amount of assets needing to be transitioned.
- vi. This question required candidates to apply their understanding of these approaches to identify the merits of each. Simply defining each is not enough. In this case the top-down approach would start with the industry or country allocation because the asset class decision has already been made.

### QUESTION 3

i.

The DJIA index is:

- an unweighted arithmetic index
- made up of 30 industrial shares.
- crudely calculated sum of all share priced divided by 30
- although the divisor gets adjusted to reflect capital changes

The Nikkei 225 index is:

- An unweighted arithmetic index
- Where constituents are reviewed annually
- Where illiquid or unrepresentative stocks are replaced with more liquid stocks
- Made up of 225 companies representing about 50% of the market value of the Tokyo Stock Exchange

ii.

#### General

- It is useful and standard practice to assess performance relative to a published index.
- It would be important for indices to be maintained and updated properly, accurately and regularly to keep them up-to-date and relevant.
- Less well-established indices they are less likely to be reliable and accurate, depending on the parties responsible for this upkeep.
- It is also important that the index chosen is consistent and representative of the fund's investment strategy

### Geography

- It is however not necessary to have a locally-constructed index.
- In fact, it is sometimes more effective to use a global index as the constituents are likely to then only include investable counters from the perspective of foreign investors, whereas not all local indices do this (sometimes include counters not investable by foreigners).

### The suggested indices are not appropriate

- The suggested indices are both not appropriate for performance management purposes.
- ...Even though they are both well-established and likely to be updated regularly and accurately calculated

What is wrong with suggested indices (*these marks can also be given if the candidate points out that their own suggested indices have these characteristics*)

- ...This is because each consists of far less stocks and will not account for the width of the respective markets (so not representative)
- ...and also each is calculated by an unweighted arithmetic price mechanism so will not account for the relative capitalisation of counters (the size of the shares in the market).
- ...They will also not allow for the free float tradeable in each market
- ...Nor for the total return – taking account of dividends, which is especially important if the proceeds are reinvested in the applicable markets

### Other suggestions

- A variety of alternative indices could be used for each market that cater for the deficiencies listed above
- For Japan, could use the local Topix Index
- or the Global FTSE Japanese Equity Index or the MSCI Japan Index
- For the US, could use the local S&P Index
- or the Global FTSE US Index or the MSCI US Equity Index.

### *Comments on Question 3*

*In part (i) most candidates managed to score some marks, but only few scored well. Many candidates incorrectly asserted that the Nikkei 225 is a weighted arithmetic index, representing the Japanese market.*

*Part (ii) was poorly answered. Candidates provided too few points and many weaker candidates did not answer the question asked, but instead offered suggestions on where else the fund should invest or on how to invest into an index fund.*

## QUESTION 4

i.

- Oil and Gas (or Energy under the latest ICB iteration)
- These companies are involved in the extraction and supply of oil and gas products used throughout the economy.
- They are usually large companies. Many of the companies, particularly integrated companies, will be large multinationals (eg BP Amoco) competing on the world market.
- Commodity price dependent. Share prices in this sector may be more closely related to movements in oil prices than to general stock market or economic movements.
- Most commodities are priced in dollars (including oil) making them similar to a dollar-denominated investment.
- They are exposed to high risk, particularly smaller exploration companies. For example, striking or failing to strike oil can have a big impact on their share price.
- In other cases new technology (e.g. the emergence of renewable energy sources or shale gas and fracking) could have an adverse impact.
- They are global - domestic sales may be a small proportion of total sales. This makes the state of the world economy more important than the state of the domestic economy for these companies.

ii.

- Backwardation is when the spot price is higher than the futures price, i.e. when the convenience yield is higher than the cost of carry
- $\text{Future price} = \text{spot price} + \text{cost of carry} - \text{convenience yield}$ .
- Cost of carry is storage cost and the financing cost of holding the underlying
- Convenience yield is the positive value of holding the underlying commodity
- The market might consider protection against shortages in the (near) future to be very important, leading to a high convenience yield and high spot prices.

iii.

- All other things being equal, the new carbon tax would reduce post-tax profits, which would reduce the value of all companies in the oil refining sector.

### Management ability

- IP's management might be more highly rated than that of GF and considered more proactive in minimising the impact of the tax and taking advantage of renewable energy subsidies.
  - E.g. IP management may be better able to pass on higher costs to clients.

### Inputs, Process & Quality of products

- The type of crude oil that IP refines might produce less greenhouse gasses
- IP may have more energy-efficient oil transportation methods than GP
- IP's refinery processes may be using new/better technology, causing a lower rate of greenhouse gasses, and therefore experience a lower tax impact than GF.

- IP may have a more diversified range of products (e.g. chemicals manufacturing) which is less impacted by the new tax.

#### Prospects for market growth

- IP may be much closer to moving from oil to renewables compared to GF, thus limiting the impact of the tax and renewable subsidies may soon more than offset the tax for IP.
- The tax might not be applied in the same way by all countries - IP may be based in a country that may need longer to implement the tax, and/or its tax could be lower.
  - IP may have subsidiaries / oil refineries in countries not covered by the agreement, more so than GP.

#### Retained profits

- IP's policy of retaining past earnings (vs GF) may have put it into a stronger financial position (tax introduction causes investors to switch to stronger companies)
- Past earnings may have been used for research and development which have led to IP being better prepared for the anticipated change towards renewable energy.

#### Capital structure and borrowings:

- The new tax may lead to higher borrowing costs for some companies that may be deemed as higher risk (e.g. new tax reduces profits and ability to repay debt)
  - this may impact GF more than IP if they are more heavily geared.

#### Labour and other stakeholder relations:

- The introduction of the tax leads to a renewed focus on ESG factors - IP may be more favourably viewed from an ESG perspective with increased demand for their shares.
- Lower potential profitability from GF may lead to lower salary increases, strikes and disruptions to operations.

#### *Comments on Question 4*

*Parts (i) and (ii) were mainly bookwork and many candidates scored points.*

*Weaker candidates only listed points in part (i), often incorrect ones, without outlining them.*

*In part (ii), weaker candidates often referred to an incorrect equation or did not show an understanding of the difference between cost of carry and convenience yield.*

*Part (iii) was poorly answered. Only a few stronger candidates showed a structured approach to providing enough distinct points, taking the context and marks on offer into account. Weaker candidates often provided irrelevant information, or only a partial of generic factors to be considered in a fundamental share analysis.*

## QUESTION 5

i.

- Five years is a long enough period to draw conclusions regarding the performance of the fund and underlying portfolios.
- Managers A and B have provided identical gross performance, both beating their benchmark
- However, on a net of costs basis manager A has beaten manager B (8.5% versus 8%). This is more relevant when comparing returns. However, fees (not shown) should also be taken into account and tax as well.
- More understanding is gained by comparing risk-adjusted returns
- In this case each portfolio represents a part of the fund assets and therefore the Treynor measure should be used.

- $T(A) = (8.5\% - 5\%) / 0.9 = 3.9$  [1 mark]

- $T(B) = (8\% - 5\%) / 0.6 = 5$  [1 mark]

- { alternatively, The Jensen measures are as follows:

- $J(A) = 8.5\% - (5\% + 0.9(8\% - 5\%)) = 0.8\%$

- $J(B) = 8\% - (5\% + 0.6(8\% - 5\%)) = 1.2\%$

}

- The Treynor/Jensen measure for manager B is significantly higher suggesting a more superior risk adjusted return.
- This means that manager B is more skilled at generating returns given a certain degree of systematic risk – even though they earned a lower net return.
- Both measures are positive indicating that both managers were able to outperform the benchmark on a risk adjusted basis.
- The standard deviation is much lower for manager B, suggesting they have taken on lower absolute risk in their portfolio (including less volatile underlying assets)
- Manager B also has a lower beta suggesting that their portfolio has lower risk relative to the benchmark.
- Manager A has standard deviation very similar to the benchmark and a beta close to 1. This suggests manager A is possibly investing very closely in line with the benchmark.
- Whereas manager B's portfolio beta suggests they are deviating significantly away from the benchmark – in line with their mandate
- This is further reinforced by the higher trading costs for manager B which suggests more frequent trading. Manager A may be benchmark hugging as not making many changes to the portfolio while manager B is actively seeking to reduce risk
- Manager B may be skilled at stock-picking in lower Beta / value stocks.
- Further Information to perform sector and stock selection profits can shed light on manager behaviour.

ii.

In the classical system, company profits are taxed twice: once in the hands of the company and once in the hands of the investor.

The investor may be subject to income tax on distributions and capital gains tax arising from increases in the share price.

The Split-rate system is similar to the classical system, but different rates are levied on distributed profits and retained profits.

Often income and capital gains are taxed at different rates, with higher income tax associated with higher tax on retained profits, and vice versa.

In the imputation system the company has to deduct some of the tax payable by investors on distributions and pay it directly to the government. √ This amount can then be set off against the total corporate tax bill of the company.

The tax deducted by the company is ‘imputed’ to the shareholder who may be able to reclaim, alternatively pay more, if the imputed rate differs from their individual tax rate on such income.

iii.

- The tax rate on income is higher than on capital gains, in absolute terms, and relative to other investors. √ Therefore, the investors would prefer, growth to income, and so might prefer growth stocks to value stocks.
- The 25% tax on growth is still substantial, so frequent trading under active management might be avoided, and thereby delaying capital gains tax. √ Wealthy investors might therefore prefer passive investing.
- The high investment income rate means investors might underweight cash and bonds.
- Investors might also consider investing more offshore, if tax rates are more attractive there.
- Wealthy investors may also consider investment through institutional products, such as insurance policies, should these have a lower tax rate.
  - They might make maximal use of retirement fund investment allowances, if these have more favourable tax treatment.

**Examiner comments:**

- i. *The question asked for a discussion of the performance yet many candidates focused on calculation of various risk adjusted performance measures rather than just one appropriate measure and discussion of the results. Also neglected to use information given on trading costs and that both managers were given the same mandate. Where performance was discussed, the responses were generally not granular enough for 5 marks.*

- ii. *Well-answered bookwork.*
- iii. *Candidates wasted time and marks providing points not asked for in the question. Question did not ask for the impact on markets or on the behaviour of ordinary investors. In any event the cohort of wealthy investors would not be large enough to impact market pricing. Poorly answered for 3 marks..*

## QUESTION 6

- i.
  - Technical analysis is the study of past market variables such as prices, yields and trading volumes in order to predict or anticipate future prices and yields.
  - E.g. Chartism; Mechanical training rules; Relative strength analysis
- ii.
  - Both approaches are active styles and therefore try to profit from market inefficiencies.
  - More active trading will incur additional trading costs compared to a passive investment style.
  - Consider differences in asset management fees charged by the two managers.
  - Technical analysis analyses past price movements to determine which stocks to buy,
  - ...Fundamental analysis is concerned with analysing the fundamentals of a share.
  - ...This involves projecting future dividends and earnings of companies.
  - The success of technical analysis depends on the skill of the manager in identifying patterns before other investors.
  - ...Success of fundamental analysis depends on the manager's ability to correctly value a share.
  - Technical analysis is a short-term strategy, because it aims to exploit market inefficiencies which will quickly be corrected.
  - ...Fundamental analysis is a long-term strategy that relies on the value of under/over - valued share returning to its fundamental value.
  - Since the investor's investment horizon is 20 years, a fundamental approach seems more appropriate.
  - A combination of both styles may however also be appropriate.
  - Fundamental analysis might be more expensive to conduct since greater volumes and types of research and data is required to value the company.
  - She needs to consider how both managers select individual stocks. Consider what method is applied by Manager A.
  - ...Consider whether Manager B is a growth, value, momentum etc. manager because that might also significantly impact returns.
  - She needs to evaluate the past performance of the managers as a proxy for their skill.
  - Consider if there are other managers applying technical or fundamental analysis that show more skill than Managers A and B and are likely to generate higher returns.

**Examiner comments:**

- i. Straight forward bookwork question answered well by most candidates.
- ii. Most candidates were able to generate some but not a sufficient number of points. It is important to not just list the characteristics of the two methods but to explain their differences by making reference to their characteristics. Candidates failed to think wider than just the characteristics of these two approaches. Some suggested that fundamental analysis is a passive investment strategy. Technical analysis is not concerned with valuing a share and determining whether it is cheap or dear, but only whether the price in the near future is likely to go up or down.

## QUESTION 7

i.

For financial services institutions, liquidity risk is the risk of:

- Not being able to raise funds (by having access to cash balances, borrowing or through the sale of assets) at reasonable cost at all times.

Gap analysis:

- All assets are classified as liquid or illiquid, and all liabilities as stable or volatile.
- A six-month remaining maturity criterion could be adopted in classifying assets and liabilities.
- The liquidity gap or net liquid assets is defined as: Liquid assets – Volatile liabilities.
- Allowance should be made for liquidation costs in converting items to cash (e.g. brokerage, banking fees, bid-offer spreads).

Duration analysis:

- Unlike gap analysis, this approach assesses the potential costs/impacts of a market stress situation on funding costs.
- Liquidity duration, or liquidity risk elasticity (LRE), measures the change in an institution's equity (where assets and liabilities are calculated using the cost of funds discount rate) from a change in the cost of funds.

ii.

The value of equity (R millions) using the cost of funds discount rate:

- PV of Assets =  $10v^{10} + 50v^{12} + 200v^{13}$  @3% p.a. = 178.70 ✓
- PV of Liabilities =  $115v^{10} + 110v^{11} + 10v^{12} + 10v^{14}$  @3% p.a. = 178.66 ✓
- Equity<sub>1</sub> = 0.04

The value of equity (R millions) using the higher cost of funds discount rate:

- PV of Assets =  $10v^{10} + 50v^{12} + 200v^{13}$  @4% p.a. = 158.10 ✓
- PV of Liabilities =  $115v^{10} + 110v^{11} + 10v^{12} + 10v^{14}$  @4% p.a. = 161.17 ✓
- Equity<sub>2</sub> = -3.06

$$\text{LRE} = \text{Equity}_2 - \text{Equity}_1 = \text{R } -3.10 \text{ million } \checkmark\checkmark$$

iii.

Interpretation and implication:

- A negative LRE as calculated demonstrates that the duration of assets is longer than that of liabilities.
- This is due to many of the liability cashflows occurring before the asset proceeds are due to be received, hence XYZ faces a shortage of cash when many of the liabilities become payable.
- XYZ should consider shortening its maturity of assets (as it can't change the liabilities), to increase liquidity,
- Or it may face even greater risks of shortages of cash when liabilities are due if interest rates increase.
- An inability to meet liabilities due to lack of liquidity will lead to reputational risk.

iv.

Possible actions to reduce liquidity risk:

- Switch to more liquid assets e.g. cash and short-dated bonds:
  - However, this introduces reinvestment risk.
  - OR this could introduce market risk to which the liabilities are not exposed.
- Switching to bonds that match the liabilities more closely:
  - XYZ may not be able to find adequate bonds for this purpose.
- Utilising derivatives to match the liabilities more closely e.g. a total return swap in conjunction with the current bond holdings:
  - Margins for exchange traded derivatives may introduce additional liquidity risks, while OTC derivatives introduce credit risk.
- Arrange suitable credit facilities with a bank to obtain funding when needed to avoid selling assets prior to maturity at unfavourable prices:
  - Credit facilities carry additional fees and borrowing costs are likely to increase with market rates unless fixed beforehand.

v.

Any two of:

- Market risk:
  - This is the risk relating to changes in the value of the portfolio due to movements in the market value of the assets held.
  - As the assets and liabilities are mismatched by term, market risk caused by interest rate changes can lead to the value of liabilities exceeding the value of assets.
- Credit risk:
  - This is the risk of a counterparty being unable or unwilling to fulfil their obligations.
  - There may be a default on the zero-coupon bonds, leading to XYZ not having sufficient assets to meet all its liabilities.

- Operational risk:
  - This is the risk of loss due to fraud or mismanagement within XYZ.
  - Any loss leads to XYZ not having sufficient assets to meet all its liabilities.

vi.

Possible uses and benefits:

- XYZ can reduce credit risk by using a credit default swap.
- XYZ can use interest rate or total return swaps to help it hedge its liabilities better (thus reducing market and liquidity risk) than just using bonds alone:
  - Bonds of sufficient duration may not be available (e.g. 14 years for the last liability payment), and longer maturity date swaps may be available.
  - The bond market may not be liquid enough to purchase desired bonds, and swaps may offer better liquidity.
- Swaps may have lower transaction costs than bonds, so overall costs may be reduced for XYZ.

### **Examiner Comments:**

*Overall performance should have been better for this relatively easy question.*

*Part (i) was bookwork and a surprising number of students did not know their definitions.*

*Part (ii) was generally done well, however interpretation of the results and implications for part (iii) was done less well.*

*Part (iv) was generally done well, although the answers for a number of students were very thin on detail (e.g. “use derivatives to match better” without further clarification, was insufficient).*

*For part (v) a number of students provided risks that were effectively the same as liquidity risk in this case (e.g. ‘actuarial’ or ‘mismatch’ risk).*

*For part (vi) many answers were too vague and brief (e.g. “help to match liabilities better” without any further clarification, or “cheaper than bonds” or “provide gearing” were not sufficient).*

## QUESTION 8

i.

Securitisation is the issue of securities, usually bonds, where the bonds are serviced and repaid exclusively out of future student fees.

ii

- The securitised cashflows would approximately be a stream increasing with some form of inflation year-on-year
  - Fee inflation is likely to be different from CPI, and would be affected by university finances
  - Payment would not start immediately – there would be a gap during construction
  - Payment is highly secure, as the drop-out rate among final-year medical students should be low
  - The cash-flow, and therefore all tranches, is exposed to low-probability high incidence risks, such as students not paying their fees and the university having fewer than 100 final-year medical students per year
- The securitisation might issue a senior tranche, a mezzanine tranche and an equity tranche
  - The instruments are sold and the proceeds transferred to the university for the building work.
  - In each period, the senior tranche is paid first, then the mezzanine tranche, with additional funds accumulating to the equity instrument, and acting as buffer for the first two tranches
  - For both the senior and mezzanine tranche, payment is structured as amortising and split into capital and income, and no repayments in year 1
- The senior tranche might be a 7 or 8-year (at least shorter than 11 years) nominal bond, with no payment in year 1
  - Fee inflation is uncertain, so it would introduce too much risk to issue this tranche as inflation-linked
  - Instrument might be re-paid quicker if fee inflation is high
  - The bond might be too small for a rating, but would be regarded as highly secure
- The mezzanine tranche would have a longer term, e.g. 11 years
  - The repayment structure might depend on expected fee inflation or repayment might be structured to reference CPI
- Equity tranche would provide a pay-out after senior and mezzanine tranches have been paid
  - University might take up all or a part of the equity tranche, to not miss out on cash-flow if fee inflation is high, which might coincide with a financially difficult period

iii.

The yield would reflect the risk-free rate at the same duration, plus

- Credit risk premium to account of expected defaults and the risk of higher than expected defaults

- This would depend on the proportion of the entire securitisation covered by the senior tranche, and the probability of individual or bulk default non-payment of students on fees (which seems low)
- A liquidity risk premium, as the issue is comparatively small

iv.

- Maximise the expected number of the years that the trust will fund students,
- subject to a 90% probability that it will fund at least 20 years

v.

Strategy a

Advantages

- This is a liability driven investment strategy, so provided the estimated real cost is born out over time, the liability is fully hedged.
  - If real fee growth turns out lower than assumed in the product projection, then the product would produce a surplus, from which further years could be funded
    - A separate investment will have to be set up
  - Limited further effort will be required to make investment decisions, and if decisions are required, on any surpluses, they will be on small amounts of money.

Disadvantages

- If real fee growth turns out higher than assumed, the product will produce a continual shortfall, with no recourse and the fund will be able to sponsor only a % of the fees
- There may be a lag in the calculation of inflation.
- The fund is exposed to the bank's continued financial well-being – if the bank fails, then some or all of anticipated payments after that could be forfeit.
- If ongoing administrative expenses turn out to be higher than expected, there will probably be no additional cash available to meet obligations, as much of the capital would be tied up in the product.

Strategy b

Advantages

- The portfolio will invest a high proportion of assets in growth assets (including equity), which has a greater possibility of producing high real return after tax.
- The portfolio is likely to be diversified, meaning specific and any counterparty risks are small.
- Due to the risky nature of the portfolio being more likely to generate additional returns, there is a possibility of funding more than students than under strategy a.
- The strategy ensures that sufficient cash will be available to meet expenses, on an on-going basis, even if assumptions of costs turn out to be different than anticipated.
- The fund retains the flexibility to
  - reduce the number of bursaries for a period, while the fund recovers, and
  - to adjust the investment strategy.

### Disadvantages

- The portfolio introduces market risk and volatility on the investments, while liabilities are likely to continue to increase, meaning there is a possibility of large capital losses in the short term, but less so over a longer term.
- Exposure to actuarial risk is much greater than under the first strategy; there is a good chance of post-tax long-term fund returns being below the return assumed in the product of strategy (a)
  - And this is exacerbated if there are high asset management fees in managing the growth fund.
- The offshore asset represents a currency mis-match
  - However, as an advantage, offshore assets represent an opportunity for further diversification and outperformance/return enhancement, especially over the longer term
- Requires more and on-going administration, resulting in higher costs
  - regular projections
  - evaluation the asset manager performance.

### ***Examiner Comments:***

*Many candidates wrote down only bookwork without referring to the scenario given, leading to underperformance.*

*Part (i) was well done.*

*For part (ii), many students did not refer to the scenario at all, and most of those who did, did not consider the nature of the student fees as a cashflow stream. As a consequence, this part was not done well.*

*Part (iii) was not well done, as most students did not consider the investment risks: market risk, liquidity risk, credit risk, etc. The analysis of a credit instrument's yield would also have been useful.*

*Part (iv) was for only 1 mark, but not well done. The objective for an ALM has two components. Most candidates specified only the risk component (which was essentially given).*

*For part (v) was well answered.*