EXAMINERS' REPORT

November 2020 examinations

Subject F105 — *Finance and Investment*
Fellowship Principles

INTRODUCTION

The attached report has been prepared by the subject's Principle 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.

The pass mark for this exam was 51.5%.

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QUESTION 1

i.

- Single purpose in nature
- Private investors' participation is for a finite period
- Have long lives
- Initial development involves high upfront capital costs with payback occurring over the asset's lengthy life
- Exhibit characteristics of natural monopolies due to high development costs
- Due to monopolistic characteristics they tend to be subject to varying degrees of government regulation, depending on the degree of natural monopoly

ii.

Economic infrastructure assets:

- Highways
- Water and sewerage facilities
- Energy distribution
- Telecommunication networks

Social infrastructure assets:

- Schools
- Universities
- Hospitals
- Public housing
- Prisons

iii.

a. Provide tax incentives for investment in infrastructure projects
b. Where state-owned enterprises (SOE's) require funding for infrastructure projects, the national government could provide financial guarantees in the event of default by the SOE's
c. Ensure clear legislation on the powers of regulators, including the setting of tariffs, improving transparency
d. Human resource investment: provide for training for government officials and give bursaries for studies leading to jobs in infrastructure / engineering to ensure that a sufficient pool of local expertise exists for the development and maintenance of infrastructure assets
e. Infrastructure assets display characteristics of monopolies and high barriers to entry. Remove structural barriers to entry.
f. Infrastructure construction is labour intensive: ensure labour policies that are likely to attract (rather than discourage) investment (esp by foreigner investors).

iv.

- In the high-risk planning phase only equity capital is suitable for financing.
- The construction phase may be financed by a combination of equity and debt with guarantees.

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v.

BigOps is exposed to climate change and associated changes in rainfall; in general the power station is dependent on water flow as projected to materialise.

Regulatory and political risk:

*The local government (which may change over a 20-year period) may not honour any agreement in terms of price and/or volumes purchased

*Electricity price increases are not guaranteed and could be subject to regulatory approval. The regulator may take various factors into account in setting tariffs, including affordability.

*social unrest and targeting of the plant due to being foreign owned

*introduction of unexpected taxes affecting the profitability of the plant

*repatriation problems if BigOps re-sells the plant

Operating risks:

*Underestimation of operating costs

*Large-scale disasters such as earthquakes

*Lack of sufficient local skills and expertise to maintain the power plant

Economic risks:

*Local economic recession dampening the demand for electricity

*Interest rate risk: increasing interest rates can cause asset valuations to fall (e.g. if BigOps intends to resell the power plant) and floating debt payments (if any debt was used by BigOps for its purchase) may increase

This may be partially offset by higher inflows later in a higher interest rate environment

*Foreign exchange risk, as the income and costs are in local currency and the company is listed offshore

Other:

Competition risk of new cheaper sources of energy coming onto the market

Risk of paying incorrect price for the project – how do we assess correct price with no comparables etc. What is the correct discount rate to use, how do we project cashflows accurately?

Asymmetry of info risk – why are they selling the project – what do we not know that they do?

vi.

The process and key decisions include the following points:

- BigOps establishes a special purpose vehicle (SPV) in a tax efficient jurisdiction;
- The SPV establishes an insurance agreement with BigOps ;
- key decisions (with the help of the reinsurer):
    - Premium payable by BigOps to the SPV which will be calculated by the reinsurer
    - define the trigger for pay-out – this could be in terms of earthquake severity, repair costs and loss of income.
- The SPV issues a note to investors; this note has default provisions that mirror the terms of the insurance agreement ; key decisions:
    - The term of the insurance-linked bond; 5 years is typical and consecutive bonds can be issued to cover the 20-year period;

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    - The nominal value of bonds to issue to provide sufficient risk-transfer – this will require an estimation of the expected loss of income and reconstruction cost in the event of damage;
    - The best way to market the bond, perhaps with help from investment banks
- The proceeds from the note sale are invested in secure money market instruments within a segregated collateral account;
- If no trigger events occur during the risk period, the SPV returns the principal to investors with the coupon payment. If trigger events occur, the assets of the SPV are first used to meet BigOps's losses, before any return of principal (if any)

Examiner comments:

Parts (i) and (ii) were bookwork and well answered, with the majority of candidates scoring full marks. It is important to note that if a question asks for three examples, then don't give more than three – only the first three are marked and no marks are scored for correct answers in the unmarked part of the answer.

Part (iii) was generally well answered. A number of candidates mentioned that the government should oblige funds to invest in infrastructure – but this is likely to result in more money being available for such investments, leading to lower returns for investors, which is not attractive to investors.

Part (iv) was poorly answered, particularly when considering this is bookwork. From the wording of the question it can be assumed that iBuild is an established company. Many candidates mentioned "venture capital" but this is applicable to newly-established businesses. iBuild requires equity capital during the planning stage and equity/debt for the construction phase.

Part (v) was generally well answered.

Part (vi) was poorly answered by the majority of candidates. ASSA continuously stresses that answers must refer to the scenario set in the question. No marks were awarded for generic answers to this question- for example, "BigOps must establish an SPV" was awarded a mark but "An SPV must be established" was not awarded a mark. Also, reference to "a catastrophe" was not awarded marks but reference to earthquakes (the catastrophe covered by the question) did earn marks where relevant. Several candidates did not appear to understand the concept of a catastrophe bond and omitted reference to the need to use an SPV."

QUESTION 2

i.

- Monetary, interest rate and inflation policy
- Banking regulation
- Implementation of government borrowing
- Performance and integrity of financial markets
- Intervention in currency markets
- Printing and minting
- Taxation

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ii.

- Foreign investment into local assets seems less attractive
- …so there would be a drop in foreign investment or even divestment.
- Similarly, local investors might rather look for higher yielding investments offshore.
- The overall effect is a weakening of the currency.

iii.

- The central bank would have a target level or range for the exchange rate.
- The central bank can sell the local currency and purchase foreign currency.
    - Using its reserves or newly printed currency
    - This will increase supply of the local currency, putting downward pressure on the currency value

iv.

The lower the value of the domestic currency and the local currency cost of factor inputs, including labour, the more competitively priced will be the goods and services produced.

Restricting the power of trade unions and a low minimum wage will depress the cost of labour and enhance the relative competitiveness of businesses operating in the country. It may attract multinational companies to shift their operations to the country.

Examiner comments:

The bookwork component of this question was well answered but parts (iii) and (iv) of the application component suggested poor understanding of fundamental economics. Most candidates scored the points for part (ii) but missed out on adding that local investors may also prefer to invest offshore. Many candidates did not read the question carefully for part (iii) and provided (complicated) INDIRECT ways of managing the exchange rate rather than the DIRECT supply and demand approach. For part (iv) many of the responses were incorrect in suggesting a more labour-friendly policy would improve competitiveness. For those that did identify the correct actions, they lost some marks by not first explaining how labour policy affects competitiveness.

QUESTION 3

i.

Corporate governance:

- Corporate governance refers to the high-level framework within which managerial decisions are made in a company.
- This is usually the responsibility of the board of directors comprising executive and non-executive directors.
- Corporate governance requires, and incentivises, management to make decisions based on the interests of all relevant stakeholders (shareholders, employees, pensioners, customers and suppliers) rather than their own interests.

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The role of non-executives in corporate governance is to:

- Provide an impartial view and represent the shareholders' interests.
- In practice this is likely to involve:
    - Challenging and contributing to the development of strategy
    - Monitoring the performance of management
    - Playing a leading role in setting the remuneration for executive directors' pay
    - Playing a leading role in the nomination and appointment of new board members
    - Playing a leading role in the audit committee, which aims to monitor the financial and risk controls and financial reporting of the company.

ii.

Factors that may lead to exclusion:

Ethical:

- A company that does not treat its workforce fairly (e.g. health and safety ignored, poor wages, child labour)
- A company that has poor relations with local communities
- A company that does business with unethical companies (sourcing inputs or selling to)
- A company producing unethical goods e.g. weaponry
- A company misrepresenting or mis-selling its products to maximise profits (e.g. products unsuitable or unsafe for use)
- A company treating animals unethically (e.g. for testing products)

Environmental:

- A company that contributes significantly (as consumer or producer) to climate warming (e.g. emissions of carbon dioxide, methane, oil extraction and delivery)
- A company that is a significant polluter of the environment (e.g. water or land pollution)
- A company that is a significant contributor to the destruction of natural environments and biodiversity (e.g. open-cast mining, deforestation for crops or development, unsustainable harvesting of natural resources such as fishing)
- A company that makes extensive use of plastics in production and/or packaging
- A company that makes extensive use of fresh water in its production process
- A company that has no intention or plan to measure, report on, manage and reduce its environmental impact

iii.

Evaluation of EEG factors:

- It may be difficult to decide on a generally acceptable set of factors to be used (there may not be universal agreement by index users on these)
- The measurement of each of the factors may be difficult (especially in a developing country):

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    - Some factors may be subjective or difficult to quantify (e.g. community relations or company ethical culture)
    - Even for quantifiable factors there may be little/no data available to support an evaluation
    - It may be difficult to decide on a suitable grading/scoring system per issue e.g. deciding on what level of plastic usage is "unacceptable" vs "acceptable"
- The source of data may be problematic – if company own data and information is relied upon, this may be misleading and unreliable
- There may not be any independent parties in the country that specialise in EEG factor analysis and independent verification
- Once factors are evaluated, it may be difficult to decide how to treat them within each category to derive an overall score per category (e.g. how important should the CO2 factor be relative to the water issue in deriving a score for environmental issues)
- It may be difficult to decide the relative weighting of scores between the ethical, environmental and governance issues to derive an overall EEG score per company

Index construction issues:

- Evaluation of EEG factors will be a complex and lengthy exercise:
    - It may not be possible to perform annual evaluations for the EEG factors
    - It may be difficult to decide how to handle issues arising between evaluation dates e.g. companies previously thought to have high governance standards suddenly facing an accounting scandal
    - The costs of producing and maintaining the index may be too high
- It might be difficult to decide how to handle corporate restructures (e.g. mergers / acquisitions between companies with different EEG scores and possibly between different industries) between evaluation dates.
- It might not be possible to derive an EEG score for some companies, making it difficult to include them in the ETHI

Issues of Acceptance:

- The number of companies in the new index will be lower.
    - This will reduce diversification within the index (compared to the MCWI).
    - Some high scoring EEG companies may be undesirable for other reasons e.g. they might be smaller and less liquid counters.
    - Thus reducing its usefulness as a fund benchmark.
- Using the same industry weights as the MCWI might not result in an accurate view of the performance of companies with high EEG scores.
    - This is because some industries as a whole might be more concerned with EEG issues than others.
    - The index might therefore include too many companies with low EEG scores and exclude companies with high EEG scores.
    - This would detract from the usefulness of the index.

- If the method of deriving the index differs from best practice in other countries, it may not be widely used (especially by overseas investors).

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- It is unlikely that a history of ETHI can be calculated showing its performance compared to MCWI performance – this might make the index less acceptable at first.

iv.

Sharpe calculation:

$R_p = [I_t + (XD_t – XD_{t-1})] / I_{t-1} - 1 = [3575 + (54-23+27)] / 3460 - 1 = 5\%$ or alternatively

$R_p = I_t / [I_{t-1} - (XD_t – XD_{t-1})] - 1 = 3575 / [3460 - (54-23+27)] - 1 = 5.09\%$

An alternative approach could be to chain-link the two half years:

$R_p = [3399+54-23] / 3460 * [3575+27] / 3399 - 1 = 5.05\%$ or

$R_p = 3399 / [3460 – (54-23)] * 3575 / [3399 – 27] – 1 = 5.09\%$

Sharpe Ratio = $R_p – r / \sigma_p = 0.05 – 0.03 / 0.2 = 0.1$ (or 0.104 or 0.1025 or 0.1045 depending on variation of method used above)

v.

Comments:

- Sharpe measure assumes normality of returns, which is unlikely to be the case for share prices
- The usefulness depends on how it will be used:
    - The measure could be appropriate if local shares represent most/all of an investors wealth, in which case a comparison of fund manager Sharpe returns can provide a guide of manager skill, however
        - Past performance may not be a reliable guide
    - If local shares represent only part of an investor's wealth, then a more suitable risk-adjusted measure should be based on systemic risk (beta) e.g. Treynor and Jensen ratios
    - Investors might be more concerned with downside risk while variance considers both upside and downside risk

Examiner Comments:

Part (i) was bookwork, and while most students could get a few points, few students knew their bookwork well enough to get full marks.

For part (ii) weaker students did not answer the question asked. The question was not a generic one about ethics and environmental considerations, but rather those that could lead to exclusion of an investment by asset managers, so "a company's BEE rating" or "gender policy" without further clarification are not valid responses to the question asked. Some students provided positive (rather than negative) factors. The lack of breadth of ideas in this part was disappointing.

For part (iii) some students did not answer the question asked and provided a list of considerations (not challenges) in developing the index e.g. "need to disclose the methodology" is not a challenge. Issues relating to industry classification and MSWI challenges were not relevant here. Industry classification

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and MSWI methodology are already established and a given starting point for the ETHI - this question was about challenges in creating the ETHI, not the MSWI. A number of students lost marks by making brief statements and not discussing their points as instructed. Students that present their answers in the form of questions need to appreciate that this form of "answering" is highly ineffective and is unlikely to gain credit.

For part (iv), a large proportion of students attempted the calculations and managed to get at least some credit. It was a reasonably well answered part.

For part (v) some students did not read the question properly and wrote about the ETHI being risk-adjusted, and many students made superficial statements like "it could be useful for investors to see risk-adjusted returns". Overall answers were disappointing given the straightforward question.

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QUESTION 4

i.

Consumer Services

Companies in this group include food, drug and general retailers, media companies and companies in the travel and leisure industries, such as passenger airlines, casinos, hotels, bars and restaurants.

most services depend upon labour more than capital.

Exceptions include hotels and retailers where property costs are high.

The more defensive companies in the group may have high gearing.

Those with stable demand (eg food retailers) or with a strong asset base (e.g. hotels) are likely to have higher borrowings.

The domestic market is the most important – most companies will depend heavily on the domestic market

although some (eg hotels) may operate in several countries.

ii.

- Interest Cover (inverse of Financial Leverage)

  profit before interest & tax / interest
  2019: 35 / 8 = 4.375
  2020: negative
  2021: 16/8 = 2

  Severe drop in interest cover in 2020 to negative with a recovery in 2021. The 2021 level is below the 2019 level and at 2 is still unacceptably low.
  [also accepted for 2020 if exceptional item is removed; i.e. -5/8]

- Capital cover (inverse of asset leverage)

  Total assets / debt
  2019: 140/80 = 1.75
  2020: 82/80 = 1.025
  2021: 90/80 = 1.125

  The 2019 was already low at 1.75 but the 2020 and 2021 are unacceptably low and in danger of bankruptcy.

- Liquidity figures are not available, but this is low or negative in 2020 and will be low in 2021.

The company is probably in breach of interest cover and capital cover covenants.

The company cannot make its 2020 debt capital repayment, and probably not the 2021 payment either.

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The debt funders are probably within their rights to lay claim to the assets or force the shareholders into raising capital.

iii.

- A rights issue: raising cash from shareholders
  - Some of the cash would be used to repay the outstanding debt (further improving capital cover)
  - Further cash can be used as a buffer to improve liquidity

- A merger or buy-out by another company
  - Other company might be interested in the tax credit and can offer access to cash and capital reserves
  - Might be less effective if the company is in the same industry, as they might have similar issues

- Convert some of the private debt to share capital
  - While this will improve capital ratios,
  - It would not improve liquidity

- Capital injection by a private equity fund that specialises in restructuring capital
  - Additional / new management expertise
  - Similar effect to a rights issue.

(mark first two alternatives given)

Examiner comments:

i. This was a bookwork question. Many students (about half) wrote about hotels only and not the whole Consumer Services industry, despite almost all students correctly identifying the industry. Regardless, it was generally well answered.

ii. Many students correctly calculated accounting ratios reflecting financial strength. Many candidates failed to comment on whether ratios were acceptable or too low. Candidates who scored well noted that they are working for the private debt provider, that private debt has covenants that are probably being breached, that the hotel company is in no position to pay back the capital as scheduled, and that some intervention is required.

iii. This question was reasonably well answered by some. Many students suggested a further debt issuance (which is inappropriate), while the question asked about share capital. Some students commented on how effective the capital raise will be, and not on how the raised capital can be applied effectively in the company (e.g. pay back some outstanding debt).

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QUESTION 5

i.

The forward swap in (ii) has two legs:

- One leg is characterised as pay notional at the start, receive the fixed rate, and receive the notional at maturity
- The other leg is characterised as paying notional at start, receive the floating rate, receive the notional at maturity. Economically this leg is the same as cash.

These two legs are similar to a long forward bond investment and a short forward cash position, and in combination this is equivalent to a forward bond, so a short position is a good hedge.

ii.

I=Income present value = 10/1.06 + 10/1.07^2=18.16835
F=(B-I)/P(0,T) =(108-18.16835)*1.07^2 =102.84826

iii.

Optimal hedge ratio h=p * vol of spot / vol of forward = 0.9*5%/6% = 0.75
Therefore volume =R1bn*0.75=R750m nominal bond.

iv.

- Cross-hedging (or Basis; also accepted) risk: The swap fixed leg and forward bond are different instruments. The swap is exposed to the swap curve while the forward bond is exposed to the bond curve.
- The correlation and volatilities may change with approaching maturity (3-year rate may have a different behaviour to 5-year rates) and/or over time, necessitating adjustment to the hedge ratio

v.

Without a clearing house:

Any payment under the forward bond would be paid to/from the bank only at expiry.

With a clearing house:

Registering the forward bond would mean initial and daily margining is payable.

Initial margin would be small as the initial transaction cost is zero.

Any changes in value of the forward bond would require daily variation margin payments.

Examiner comments:

This question is a series of five 2-mark questions related to derivatives and hedging. While the questions were relatively simple, students had to show understanding to score well.

i. Fairly simple application question. Generally well answered.

ii. This was a straightforward calculation. While many candidates did the calculation correctly, many others clearly did not know this part of the work well.

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iii. Some candidates answered well, and many candidates had the two standard deviations the wrong way round, not correctly identifying the derivative and the underlying in the equation.

iv. Not answered well. Candidates generally did not know the difference between cross-hedging and basis risk, and very few pointed out that the hedge would need adjusting over time.

v. Bookwork. Reasonably well answered.

QUESTION 6

i.

- Hedging the liability will reduce the risk that shareholders suffer investment losses.
- But the possibility of upside will also be significantly reduced.
    - The proposal therefore has to be assessed in light of the company's risk appetite and shareholder expectations.
- Whether using bonds or swaps, the proposal would require a change in the investment strategy from a multi-asset portfolio to a pure bond portfolio.
    - Transaction costs will be incurred from effecting the change, negatively impacting shareholders.
    - Asset managers might need time to sell equities and determine which bonds to buy,
    - …which implies that it will take time for the benefits of the proposal to be realised.
    - Tax might be payable on any realised gains from the sale of the equity portion of the portfolio.
    - An immediate implementation might require equities to be sold at an unfavourable time, potentially locking in capital losses.
- Swaps and bonds introduce counterparty credit risk to which the liability is not exposed.
- Bond of long enough duration might not be available,
- …introducing reinvestment risk if bond proceeds received at maturity have to be reinvested at unknown rates.
- The annuity book is exposed to longevity risk, making an exact match impossible and possibly introducing reinvestment risk.
- If the tax status of government bonds worsens, the asset proceeds might be insufficient to meet the liability payments.
- Mark to market risk may exist:
    - The value of the liabilities might not change in the same way as the value of the assets when the yield curve charges, reducing the effectiveness of the proposal.
    - Basis risk can arise when the swap curve moves differently to the bond curve.
- Swaps might be preferred over bonds because:
    - Swap markets may have greater liquidity and lower transaction costs than bonds.
    - Swaps of longer maturities than government bonds may be available.
    - Because swaps aren't standardized contract, it could offer greater flexibility.
- The downside to using swaps, however, is that,
    - If collateralisation is required, then this will require the movement and investment of collateral on a daily or weekly basis.
    - Closing out a swap position is more complex than selling a bond.
    - The legal documentation required might be expensive and time consuming to put in place.
- Investments into cash is unlikely to generate sufficient returns and
- …is unlikely to provide protection against a change in the level or share of the yield curve.
- Consideration needs to be given to any regulatory restrictions in the insurer holding derivatives.

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ii.

- It might be a much simpler strategy to implement because it won't require a change in the investment strategy of the underlying assets.
- It could therefore possibly be implemented quicker and the exposure to investment risk be reduced sooner.
- However, calculating the mismatch reserve could be complex requiring an asset liability model
- It could be more cost effective, because,
    - The strategy could save on the transaction costs that would be incurred in changing the investment strategy required in (i).
    - Tax on capital gains realised on the sale of equity won't be payable.
    - The ongoing rebalancing of the portfolio required to maintain the hedge won't be required.
- However,
    - The cost of funding the reserve will be incurred, which could be large.
    - The funds will be tied up and will likely be invested in less risky assets producing relatively low returns.

iii.

- An ALM will encourage the insurer to formulate explicit investment objectives, if they had not done so before.
- The ALM will assist the insurer to develop an investment strategy that best meets its investment objectives, by
    - comparing outcomes under various investment strategies (including full hedging) with their investment objectives
    - taking into consideration the insurer's risk appetite
- ALM gives decision makers a better understanding of the risks associated with different investment strategies.
- Acting on the ALM results can help insurers manage their mismatch risk
    - With the current asset mix, the factors that will give rise to a change in the value of either the liabilities or assets, are not the same, e.g.
        - change in yield curve shape
        - high or low equity returns
    - exposing the insurer to mis-match losses (or profits)
    - An ALM will help the insurer understand what the impact of a change in these factors might be on their mismatch position

Examiner comments:

On the whole, this question was not answered well. Candidates were required to show insight into the specific scenario presented, and this was largely lacking.

i. This question was not answered that well. Many candidates went into detail on how the liability hedging strategy would be implemented. However, commenting on the proposal requires evaluating the pros and cons, benefits and costs, advantages and disadvantages of this proposed strategy. Some candidates spoke of a fund whereas this is a product sold by an insurer.

ii. *This question was relatively well answered. Some candidates went about explaining how the mismatch reserve would be calculated or evaluating the strategy as a whole, but the focus of the question was to evaluate this alternative strategy specifically from a simplicity and cost perspective.*

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iii. This question was relatively well answered. If candidates considered the scenario and prior parts of the question, they would have been able to come up with more uses of an ALM exercise.

QUESTION 7

i.

Risk budgeting is a process that allocates risk to those areas of the portfolio where it is most efficient in terms of generating higher returns. It involves

- Deciding how to allocate the maximum permitted overall risk to total fund active risk and strategic risk
- Allocating the total fund active risk budget across the component portfolios.

ii.

- Risk budgeting input parameters may have changed from the previous exercise, e.g.
  - lower total allowable risk, perhaps due to a lower funding level
  - reduced total active risk budget
  - possible allowance for a higher strategic risk budget

- To reduce management costs on the cheaper passive component
- Reflects trustees' belief that the market is increasingly/possibly efficient
  - However, still believe in active management being able to enhance returns and want to take advantage of that.
- Some part of equity market (e.g. small caps) may be excluded from available passive funds
- With fewer assets allocated to active management and possibly fewer active managers used, there may be a time and cost saving on selecting, evaluating and monitoring managers

iii.

- Need to decide on which index to track:
  - What index has been used in the ALM modelling and risk budgeting, and should the trustees choose a different index to this e.g.
    - Market cap weighted or weighted by other techniques;
  - Does the selected index plus active portfolio comply with risk budgeting exercise assumptions;
  - Does the selected index comply with any relevant regulation;
  - What is the historical risk and return profile of the index, and how does that compare to the fund's risk budget;
- Certain indices have built in biases (which affects risk) that the trustees need to be aware of:
  - E.g. poor diversification heavily weighted towards a handful of stocks;
  - Or a built-in style bias (e.g. a value bias for a fundamentally weighted index).
- Which vehicle to select – a managed passive fund or an exchange traded fund:
  - Number of funds / managers to use and how funds are split between them
  - If an ETF is selected does it hold actual underlying or use derivatives which introduces additional risks
  - If appointing a managed fund – need to select a skilled passive manager:

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        - Compare tracking errors for various index tracking managers.
    - Compare the effective costs of various funds/ETFs
- Is there a portfolio construction method preferred by trustees: full replication versus synthetic.

iv.

- Manager fees
- Manager lacks skill to track the index appropriately (however 25 bp p.a. might not be significant – this should be compared to other passive managers)
- Large cashflows in or out relative to the size of the portfolio (resulting in a delay in deploying)
- Trading and rebalancing costs
- Illiquid shares – cannot rebalance perfectly
- Dividends reinvested differently from the index and/or not at the prices assumed in the index

v.

- One may take a partial replication approach, using a stratified sample of stocks on the index one is attempting to replicate,
- where the aim is to ensure that the sample reflects the overwhelming majority of the variation on the index.
- The stratification process will need to ensure that there is correspondence between the sample and the full set with regard to criteria such as
    - economic sector, market capitalisations, and exposure to external influences such as commodity prices, offshore earnings and global economic conditions.
- A well-specified multifactor model, where the factors are carefully chosen to reflect the priced sources of risk in the market, can assist in identifying portfolios which move closely with the overall index universe.
- Alternatively, or in addition, if suitable derivatives are available on the index or subsets of it, it may be possible to construct a synthetic fund of cash and these derivatives which will broadly replicate the movements of the index.

Examiner comments:

For the most part the bookwork of part (i) was adequately handled. Poor reading of the words "local equity", led to some of the later responses going in the wrong direction. For part (ii) the more obvious reasons (e.g. cost saving) were identified but candidates were not able to generate a broader range of ideas. Candidates also, for the most part, failed to tie this response to the topic of the whole question which is risk budgeting. So, marks were not awarded for simply mentioning "risk appetite". The particular risk needed to be identified as ACTIVE risk. Similarly, for part (iii) some of the points in the solution that required more insight were usually missed. For parts (ii) and (iii) candidates must realise that not all indices are naturally diversified. Part (iv) was generally well answered – some missing the point on cashflows. For part (v) it was obvious that many candidates did not understand how multifactor models work.

END OF EXAMINERS' REPORT

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