Institute of Actuaries of India

Subject SA7-Investment and Finance

November 2019 Examination

INDICATIVE SOLUTION

The indicative solution has been written by the Examiners with the aim of helping candidates. The solutions given are only indicative. It is realized that there could be other points as valid answers and examiner have given credit for any alternative approach or interpretation which they consider to be reasonable.

Solution 1:

i) As donations and investment income are in excess of current expenditure, the cash flow position is positive. [1]

There may be scope to reduce expenditure providing some flexibility to absorb investment losses [½]

Cash inflows and outflows could be lumpy due to one-off large donations or capital expenditure [½, either inflows or outflows]

If the fund is expected to be cash flow positive for some time then it may be able to make long-term investments, [1]

such as long dated infrastructure projects, [½]

or private equity. [½]

There is less need to sell assets early or be a forced seller to meet cash flow requirements [1]

allowing the fund to invest in less liquid opportunities [1]

There is less need to invest in income generating assets [1]

New cash flows can be used to rebalance the fund's asset allocation [½]

and fund future new opportunities [½]

potentially without the need to sell other assets [½]

[Max. 6]

ii) The stated primary objective of the fund is not an explicit or guaranteed liability and is more of an ambition [1]

Ideally the assets will at least need to grow sufficiently to match the increase in the cost of providing the university services. [1]

A suitable benchmark may therefore be based on the cost of education, [1]

but as this is unlikely to be available the closest proxy may be some sort of inflation linked benchmark. [1]

Depending upon the market there could be an inflation measure. [½]

The benchmark could allow for a margin of outperformance, especially given the potentially long-time horizon, higher risk appetite and belief in active management [1]

The benchmark could be set in line with the return objectives and amount of risk taken, e.g. CPI + 4% [1]

The objective is a long-term ambition, so results over rolling periods or longer periods may be suitable [1]

The chosen benchmark can also have a consideration that the constituent stocks/companies in the benchmark adhere to ESG standards that is considered to be appropriate by the management.

Some endowments may consider peer group benchmarks or a benchmark relative to an equity index, but these may be less suitable as they do not address the objective of the endowment [½]

[8]

iii) Value – focuses on purchasing shares that are relatively cheap or good "value" [1]

when considering factors such as Book to Price, [½]

Dividend Yield, [½]

Earnings Yield [½]

Cash Flow Yield [½]

and Sales to Price [½]

Momentum – purchasing (selling) those stocks which have recently risen (fallen) significantly in price [1]

on the belief that they will continue to rise (fall) [1]

owing to an upward (downward) shift in their demand curves. [½]

[Max.4]

iv) Pros of managing the infrastructure investment in-house:

- Closer alignment of interests [1]
- Close monitoring and interaction possible [1]
- Potentially lower cost [1]
- Full control over investment [1]
- Ability to have more focussed portfolio (because of diversification with other assets, less need to have a lot of diversification within the portfolio) [1]
- More flexibility to incorporate the endowment's philosophy of active management and ESG factors [1]

Cons of managing the infrastructure investment in-house:

- Potential requirement to hire additional specialist resource [1]
- Difficulty in attracting the most talented investors in this specialist area [1]
- Fixed costs of setting up new capability can be large [1]
- Less ability to diversify and pool with other investors [1]
- Access to infrastructure markets may be complex and require more experience compared to investing in stocks and bonds [1]
- Infrastructure specific issues, including regulatory, legal and tax issues make outsourcing to a specialist more attractive [1]

[Max. 10]

v) Agency risk is the risk that arises from the misalignment of interests between stakeholders. [1]

When a principal hires an agent to work for him/her, the agent will not necessarily act in the interests of the principal, and instead may act in their own interests. [1]

The existence of information asymmetry contributes to the potential occurrence of agency issues. [1]

The internal investment team (as agent) may for example have an incentive to:

- Increase financial rewards for its senior management/staff
- Focus more on expansion of the team than cost control.
- Prioritise internal management of assets, instead of outsourcing which could be more efficient from the university's perspective
- Take too much risk, so to boost bonuses or status
- Focus too much on peer group performance
- Maintain the status quo, rather than adapt to meet the university's needs

[6]

[Max.8]

vi) This issue can be managed and reduced somewhat by attempting to align the interests of the principal and the agent. [1]

This could be done by having a variable pay element for staff or management of the internal investment team based on performance. [1]

Variable pay could be deferred [½]

The principal could employ another party to oversee the internal investment team and verify that they are acting in the principal's interest. [1]

However, this usually adds an extra dimension to the principal-agent problem. [1]

Having a clear benchmark or financial objective, [½]

that takes into account risk taken and is being monitored closely [1]

A process for requiring sign-off by an independent body or university representatives for significant investments, staff number budgets and the decision to in-source or outsource [1]

The university could ensure greater oversight of the internal investment team through representation on boards or committees [1]

[Max. 6]

[42 Marks]

Solution 2:

i) The behavioural bias he exhibits are

1. Oversimplification: This refers to the fact that complex decisions are often approached by first simplifying the complexity down to few manageable issues. Once the issue has been selected a decision is made just basis that.
2. By investing in just fixed deposits and PPF the investor here has exhibited to oversimplifying the investments he has made. He has broken it to managing just few F. D's, PPF's etc and then the decision to continue for last 10 years is basis that.
3. Status Quo bias: People tend to leave things as they are rather than make radical changes. This often happens because people do not have any narrative with which to base an alternate decision
4. Once the decision was made, he continued to remain invested in FD's and PPF's to maintain status quo. He didn't take any other decisions to change his status quo.
5. Confirmation bias: Investors tend to ignore that contradicts what they believe and seek out information that confirms what they believe. This reinforces the overconfidence that they have in their judgement.
6. To justify his decisions, he ignored the stock market returns and in fact the statement made by him" stocks go up and down" is to provide himself with the confirmation that his decision was right.
7. Conservatism bias: This bias suggests that people form a decision based on the information at a certain time, but once the opinion is formed, they are unlikely to change it based on new information.
8. He exhibited conservatism as he relied on what "his parents" invested in" and once that opinion was formed, he didn't move from that.
9. Illusion of control bias: This bias suggests humans feel that they have more control over and are more responsible for the outcomes of the situations than they actually do.
10. This is exhibited by him as he feels more in control with fixed deposits and PPF's and ignores any other investments.
11. Regret aversion bias: This is a tendency for people to avoid making a decision or a change if there is a high fear of regretting it afterwards.
12. His statements reflect this tendency of not wanting to venture anything which may lead to regret afterwards.

[9]

ii) From the investor's perspective, the product seems to give a guaranteed return compared to yields on risk-free bonds of a similar duration. Just looking at the guarantee part, given that he is used to guaranteed rates from PPF or FD's, this would be a product which may find attractive.

There is no upside above the fixed return, so the investor will be exposed to the risk of high inflation eroding the value of the future pay out. However, this feature is akin to his current portfolio.

The main risk for the investor will be an equity risk, whereby a severe fall in the market will cause the investor to lose much of the funds invested. This is what he fears the most. However, it is a small way to start exploring investments into the equity market.

[2]

Underlying portfolio held by the institution

The institution is likely to begin to match the guarantee using a portfolio of 5-year government bonds. Put options on the NIFTY total return index could also be written by the institution for a cash lump sum. This lump sum might then be used to buy a 5-year zero-coupon bond.

If the index falls below the current level, the put options will be exercised against the institution, and would need to be paid for using funds from the portfolio. However, this

coincides with the scenario whereby the investors are expecting their funds to be diminished

[2]
[4]
[13 Marks]

Solution 3:

i) Even though the primary function of institutional investments is to generate investment return, the investment process doesn't not exist independently of the wider economy or society at large.
In simple words if the investment process is not carried out efficiently many people and business sin wider economy and society will lose out. If the investment policies do no respect peoples environmental and ethical wishes, society may find that it is funding the very things it hopes to eliminate. "Any institution exists for the sake of society and within a community"
In the recent years there has been an increase in expectations for institutional investors with regard to the "wider impact".

[2]

There are various views on the impact of ESG on portfolio. One perspective is applying ESG constraints will lead to reduction of potential investment return because of the smaller universe is likely to result in compromised performance compared to an unconstrained, larger universe.
Another perspective is that selecting companies with strong ESG credentials tilts the portfolio towards companies which may be more successful in future and therefore ESG acts as a filter to identify future profitable enterprise.

[2]
[4]

ii) The critical questions to be asked are

- What is the impact on the expected level of investment return?
- What are the risks associated with the policy?
- How will the policy be implemented?
- Is the policy properly documented?

[2]

iii) Negative screening means avoiding companies that fail an ESG test. The exclusion from a fund or plan of certain sectors or companies involved in activities deemed unacceptable or controversial. If a firm's practices run counter to the fund's values, then it is screened out of the investment portfolio. It's like a boycott, but with investment capital. For example, a strong view on environmental factors may remove fossil fuel producers and heavy industry from its eligible universe. This is referred to as negative screening,

Whereas Positive screening means buying companies that pass a hurdle or test. Investment in sectors, companies or projects selected for positive ESG performance relative to industry peers. For e.g. bonds that fund key infrastructure development in key social areas (such as hospitals) may be actively purchased.

[4]

iv) The simplest strategy would be to buy a protective put by buying put options. These could be at- the-money or out-the-money options depending on how much downside protection the investor required. The amount of options to be purchased would equal the value of the portfolio to be hedged. It would be possible to buy such options based on a representative equity index. [1]
If the value of the equity market falls, then the holder of the put option has the option to sell the underlying at the strike price and hence recoup the losses suffered in the portfolio. [½]
Private equity

The main problem with using such a strategy for a private equity portfolio would be the lack of correlation between movements in the equity index and movements in private equity portfolio values. [1]

This is called cross-hedging risk. Although the private equity market is linked to the equity market, it could react to changing economic conditions in a completely different manner. [1]

Another problem is the difficulty in obtaining private equity portfolio values. These can only be accurately valued at the wind-up of a fund. Thus, it would be difficult to monitor the effectiveness of the hedge. [1]

It would also be virtually impossible to manufacture an over the counter put option based on a notional private equity portfolio because such portfolio valuations are subjective. [1]

A further problem is related to the term of the investment. Private equity funds typically last for 10 years or more, and any hedging strategy would have to exist for this long in order to be effective. This would require a great deal of rolling over if traded options were used or would require a very long over-the-counter option to be written, which may not exist or may be expensive to create. [1]

The fund may also encounter regulatory or other restrictions in implementing such a strategy. [½]

There would be significant other costs in such a strategy such as broker fees and transaction costs. [½]

There may be significant operational risk and credit risk if over-the-counter options were used. [½]

[8]

v) This type of investment requires a great deal of due diligence as it is will be one large investment covering 15% of the portfolio. [1]

The due diligence process should cover the following:

Return expectation

- Corporate financial analysis to place a value on expected income stream
- Estimated energy generation and likely future energy prices.
- Sensitivity and Scenario analysis to understand the value of business
- Due diligence of the owners and any third party.
- Tax analysis to understand if any tax implications

[2]

Investment characteristics

- Impact on fund's risk level and expected return
- Marketability of such investments tends to be low. From a future valuation point of view also it could be tricky to find any suitable measures to value such investment
- Would the Pension fund require an annual valuation? If so, is there any expertise in house or external available?
- Liquidity of such investments – both in terms of any future investment
  And Impact of any upgrade. Liquidity of such investments would be very low. However, given that it is for a Pension fund, where liability is long term, this may be not be a big risk
- Views/ any mandates on whether Pension fund can participate in such transactions
- Particularly with respect to risk/return profile from funds perspective
- Whether income stream is correlated with the pension fund liability (e.g. inflation linked)

[2.5]

Legal review

- Legal review of agreements governing the ownership of the solar farm and associate rights

[1.5]

- Legal review of the electricity supply, purchase and support agreements.
- Legal review if bank lending agreements, including covenants.

Management aspects

- Fund will need to carefully consider how its interest are represented.
- Active management could be a constraint. Given it has 30% shareholding but whether any voting rights are provided. Is there any board seat being offered?
- The fund will want to understand the sponsor's management style and commitment to the project over the long-term. The manufacturing company holds 40%. What will happen post the construction phase?
- Especially important for the fund to review any scenario where the control is sold to some other third party
- The fund would want to understand if there are any conflicts of interest
- Also, if the fund is likely to want the options of selling its interest

[2]

Diversification

- There could be diversification benefits provided with other assets held by Pension fund e.g. equity, bonds etc. However, this investment would fully utilize the fund investment target in alternate investments of 15%.
- Is that being reviewed? Would the board prefer to spread the alternate investments in couple of more investments?

[1]

Competition

- Likely aggressive competition given that this is a growing space. Moreover, the competition is expected to be sophisticated. Those with deeper pockets are likely to compete hard. A lot would also depend upon how the competition plays out in the distribution of the energy.

[1]

Regulations and Pricing

- Given this is a sunrise industry, are there any regulations? A lot will be dependent on the Government’s focus on such initiatives. Hence any regulations enabling such alternate power generation will be critical. A flipside could also be if there are any stringent regulations / curbs placed on pricing of the energy prices in future.

[1]

vi)

- The key difference in reviewing this proposal to the previous one is that this will cover only 1% of the investment. Though the due diligence work is important, but the fund can take a more aggressive approach to the investment. [½]
- Here the company “Faster.com” is a startup which is in expansion mode. Nothing much is given about the revenue being generated.
  Hence the investment here is to be purely seen as a VC approach where the fund could look at early investment and an exit in medium term if the valuations are ripe.

[1]

- The key question to answer here would be does that meet the investment philosophy of the fund? [½]
- The other key areas that would merit consideration are: - [3]
  - Board/Management quality of “Faster.com” –
    - Do they have industry experts and technology exports with them?
    - How well do they understand the dynamics and buyer/seller sentiments for the other verticals segment?
    - There are merits of diversifying into different verticals, but do they have experts to manage each of them?

- Market Growth Prospects
  - The model of connecting buyers/sellers is gaining appeal amongst the younger generation

- New regulations
  - Any regulation threat as currently such business is largely unregulated.

- Product/Service Quality
  - What is the process adopted by this portal to secure the transaction? How well the portal manages to match the needs of potential buyer's basis parameters such as the ones stated above. Are there any user feedback ratings that can also indicate how good their service is? Have they been consistent in providing good service standards across time?

- Input Costs:
  - These are primarily technology driven. Technology costs comprise of both fixed and variable – arguably the former would be the heavier component. The fixed costs in turn would get averaged out across the various sales transactions – hence depending upon the average number of sales transactions concluded through faster.com the break-even point would get influenced.'

- Retained Profits
  - Likely not very high since these companies have heavy overheads and longer break-even terms.
  - However, the size of the parent/investor pockets can be a suitable proxy to gauge the level of risk appetite and potential market aggression.

[5]

vii)

Swap Portfolio	Longer dated Gilts	Long gilt future
- There is a counterparty risk in a swap. This can be reduced by margin or by central clearing, but it still is a potential problem.	+ The yield on gilts could be higher in places than the yield on a swap, therefore there is a yield advantage.	- There would be a substantial margin requirement for such a large futures position which may result in cashflow problems.
+ Flexible in term. The scheme can accurately design the exact spread of durations for the swap portfolio that it wants.	- There is a limited number of ultra-longs. The scheme may find it is heavily exposed to these specific issues.	- The gilt future has a term of 10 years (similar in other countries) and may not respond to changes in interest rates at longer durations.
- Swaps are illiquid and may cause operation or valuation problems in the future.	- There is increased exposure to the government which would make the scheme vulnerable to a rating downgrade.	- The future would need to be rolled over indefinitely, which would cause basis risk and incur costs.

- A large swap portfolio may cause problems in the future if the scheme is split through mergers or acquisition activity.	- The term of ultra-longs may still be less than required. Swaps are available at longer durations.	+ This would be quick and easy to put in place, but there may be capacity constraints if the scheme has a large position.

[1 each pt.]
[Max. 10]
[45 Marks]

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