Actuarial Society of India

EXAMINATIONS

23rd June 2005

Subject CA11 – Assets

Time allowed: Three Hours (10.15* - 1.30 pm)

INSTRUCTIONS TO THE CANDIDATE

1. ***You have 15 minutes at the start of the examination in which to read the questions. You are strongly encouraged to use this time for reading only but notes may be made. You then have three hours to complete the paper.***

2. ***You must not start writing your answers until instructed to do so by the supervisor.***

3. ***The answers are not expected to be any country or jurisdiction specific. However, if examples/illustrations are required for any answer, the country or jurisdiction from which they are drawn should be mentioned.***

4. ***Mark allocations are shown in brackets.***

5. ***Attempt all questions, beginning your answer to each question on a separate sheet.***

6. ***Fasten your answer sheets together in numerical order of questions. This, you may complete immediately after expiry of the examination time.***

Professional Conduct:

"It is brought to your notice that in accordance with provisions contained in the Professional Conduct Standards, If any candidate is found copying or involved in any other form of malpractice, during or in connection with the examination, Disciplinary action will be taken against the candidate which may include expulsion or suspension from the membership of ASI."

AT THE END OF THE EXAMINATION

Hand in BOTH your answer script and this question paper to the supervisor.

Q.1) You are investment adviser to "Twinkle Fund" which is an institutional investor. One of the Directors suggested that you must hold shares in a range of investment trust companies. Explain the rationale behind this suggestion. **[5]**

Q.2) In terms of investment risk, classify each of the following assets in terms of level of risk on a scale of 0 to 10 where 0 is no risk (cash in hand) and 10 is extremely risky, from the point of view of an investor resident in India.

- **a.** A 20 year index-linked government bond
- **b.** Shares in AAA rated corporate
- **c.** Conventional one-week call deposit with one year to redemption
- **d.** Revolving one-week call deposit with a well-known clearing bank
- **e.** Shares in a small specialist mining company
- **f.** One-year sterling Eurobond issued by major German company
- **g.** Buy put options in a major food retailer
- **h.** Buy call options on the NIFTY 100 Index
- **i.** One year term deposit in dollars with Citibank
- **j.** One year term deposit with a well known clearing bank

[5]

Q.3)

a) Briefly describe the steps you would follow in identifying the risks in a capital project.

[5]

b) The Government of Honeyland is considering building a new multi-storied parking lot. This project is offered to Company K, which is entitled to receive all the revenues generated in each of the years 3 to 5 and afterwards the ownership will revert to the Government.

If the project is a success then the revenues are estimated to be in the range of Rs.40-50 crores per annum. Otherwise, the revenue will be in the range of Rs.20-30 crores. The probability of success is 2/3.

The cost of project is Rs.50 crores and if the weather remains fine, it will be completed within one year. Bad weather will cause construction to drag on into year 2 with an additional cost of Rs.20 crore. The probability of bad weather is ½.

Company K also faces the risk of possible strike action by the workforce. If a strike occurs, it will increase the cost in each year of construction by 20%. The probability of strike is ½ if the weather is good but only ¼ if the weather is bad.
Assuming all cash flows are assumed to arise at the start of each year, calculate the expected NPV of the project, using a discount rate of 10% per annum.

Comment on your results. **[10]**

c) In general terms discuss the financial consequences of risk mitigation. **[3]**

Total [18]

Q.4) Explain the following terms:

- **a)** Immunization
- **b)** Inflation risk premium
- **c)** Run off basis
- **d)** Terminal funding
- **e)** ROCE

[5x1=5]

Q.5)

a) Explain market segmentation and the basis on which this concept is developed. **[3]**

b) If a life office sold a very large amount of annuity business, explain what impact this might have on the yield curve. **[2]**

c) Explain why the curve of forward rates does not necessarily represent the true forward rates that would be offered by the market. **[3]**

Total [8]

Q.6) You are the investment manager of "Tulip International" which is a financial institution whose entire fund of Rs.100 crore is either invested in securities listed on the Mumbai Stock Exchange or held as cash. Just less than 20% of the fund is invested in the shares of property companies and a further 15% in the shares of investment trusts with substantial overseas holdings.

One of the Board Directors recommended that you should sell property company shares and investment trusts and reinvest the proceeds directly in property and overseas securities.

a) Prepare a memorandum setting out the advantages and disadvantages of the current policy with that of one proposed by the Director. **[8]**

b) If you decide to invest directly in property and overseas securities, indicate the range of assets you might consider. **[5]**

Total [13]

Q.7)

a) Outline the relationship between gross redemption yield and inflation risk premium. **[2]**

b) An investor with real liabilities expects future inflation to be 2½% per annum. She requires a return from conventional government bonds of 1% more than the return from index- linked government bonds in order to compensate for the inflation risk on conventional government bonds. If the yield on conventional government bond is 5%, would she choose to purchase index – linked stocks yielding 2% real or the conventional stocks. **[3]**

Total [5]

Q.8)

a) Outline the difference between counterparty risk and credit risk. **[2]**

b) You are investment advisor to a credit rating agency, which is well known for credit ratings for the sovereign debt of various countries. Draft a memo to the Board setting out the factors you may consider in advising on credit ratings. **[4]**

c) You are investment advisor to a bank. Outline the aspects that you have to consider when deciding on securities offered as collateral. **[3]**

Total [9]

Q.9)

You are investment advisor to a UK institutional investor and your liabilities are predominantly medium to long term. You have been approached by a US investment bank to consider purchase of warrants that one of their client companies, plans to issue. The following information is available concerning each warrant.

- Premium of UK Pound Sterling 2,000
- Exercise price of UK Pound Sterling 45,000.
- Exercisable in three years time
- Payment to the investor on exercise is calculated as the greater of
  - $ 60,000
  - $1 multiplied by the sum of Dow Jones index on last day of each of March, June, September and December in the next three years.

You may assume that Dow Jones currently stands at 4,800 and that 1 UK PS = U S $ 1.50

State in general terms the benefits that this security might offer your fund, giving a detailed description of the circumstances that might make it a profitable investment and outline fully the potential risks.

[10]

Q.10)

The assets of a pension fund have a market value of Rs.100 crores. The valuation assumptions are as follows:

- Interest rate of 5% per annum
- Dividend growth of 2% per annum

The current dividend yield on the XYZ, all share index is 3.1%. The appropriate bond chosen has exactly 15 years to run, is standing at par, and has its next half yearly coupon of 2.9 payable in exactly 6 months. The notional portfolio chosen is 75% equities 25% in bonds.
Calculate the assessed value of the fund stating any assumptions made.

[5]

Q.11)

Calculate the present value of the following lease:

- remaining term of 40 years
- one open market rent review in 20 years from now
- current rent of Rs.10,000 per year annually in advance to the freeholder

- rack rent of Rs.15,000 per year annually in advance.
- property recently let on a 40 year sub-lease with rent reviews every 4 years

Assume rack rent increases at 5% per annum and using a valuation rate of interest of 10% per year. State any further assumptions.

[7]

Q.12)

(a) You are the investment advisor of multinational institutional investor. With special reference to expected returns, bench marks and restrictions and the general circumstances, briefly mention the factors that would influence long term investment strategy.

[4]

(b) Describe how a stochastic model can be used in asset liability modeling to assess the long term solvency position of a pension fund. **[3]**

(c) Briefly comment upon the following techniques for determining investment strategy and also the problem in adopting these techniques.

i. Mean variance optimization
ii. Basing asset allocation on market capitalizations
iii. Shadowing comparable strategies

[3x1=3]
Total [10]

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