Actuarial Society of India

EXAMINATIONS

June 2005

SA2 – Life Insurance

Indicative Solution

INDICATIVE SOLUTIONS

1.

i) Discuss the advantages and disadvantages to InvestLife of acquiring TradLife compared with the alternative of investing to expand their existing distribution system.

Scale:

Advantages of scale and reduced ongoing costs of overheads with a bigger volume of in force and new business.

Costs:

Disadvantage of one off costs of the acquisition, professional fees, management time, and restructuring and retrenchment of duplicated functions such as actuarial, operations, investment, finance, rationalising branches.

May need incentives to retain key staff.

Brand and publicity:

Positive perception of an aggressive, expanding company.

Need to communicate with TradLife policyholders to minimise lapses and concerns.

Is the TradLife brand good? May reflect adversely on InvestLife brand.

Distribution:

InvestLife will acquire a well trained, productive agency force which will enhance their own force and reduce their dependence on the bank distribution.

Systems and operations:

IT systems will require conversion.

Does InvestLife's system support participating reversionary bonus business?

InvestLife would prefer to operate only one unit pricing system after the merger. This may be rendered difficult by policy terms and conditions.

Differences in corporate culture, will TradLife staff adapt?

Products:

A significant disadvantage is TradLife's participating business which will bring problems of PRE, 90/10 restrictions on shareholder transfers, expense allocation.

If InvestLife plans to cease selling participating business, then this will bring issues of managing a closed, declining participating fund.

TradLife does not bring any new products or product expertise.

On the other hand this will simplify amalgamation of the business.

Investments:

The investment policy will need to be revised, especially for the participating policyholders but also for any unit linked funds which have different asset allocations.

Capital management:

The price to paid for Tradlife is obviously important. The net asset value of the company and the value of in force business is fairly straight forward, but as InvestLife plans to amalgamate the companies, the brand value of TradLife will be negligible – indeed InvestLife presumably considers that their own brand is more valuable otherwise they would be better advised to transfer the business of InvestLife into TradLife.

As a merged entity, the statutory minimum capital requirements may well be less than for the sum of the two companies.

[1 for each point, max 10]

ii) Discuss the expectations of the participating policyholders of TradLife and how these expectations could be affected by the proposed transfer. Also discuss ways in which their entitlements and expectations could be protected.

Expectations

- The participating policyholders' expectations are probably not clearly or legally defined. However it is likely that they have an expectation of bonus rates in line with benefit illustrations, that they will be part of a growing participating fund and that there is some prospect for higher bonus rates and lower expenses as the fund grows and as the free surplus is strengthened.
- TradLife is a start up company and it is likely that there is little or no surplus in the participating policyholders' fund and so any adverse experience will impact bonus rates immediately.
- InvestLife appears to be committed to unit linked business. Will InvestLife continue to sell participating business? If not, the participating policyholder fund will be closed to new business and have the problems of a declining fund with little or no surplus – increasing unit costs, declining security, need for a more conservative investment strategy, stability of bonus rates.
- Shareholders' may want to receive their share of future surpluses as quickly as possible. This would be helped by higher bonus rates, but this may be unsustainable and lead to problems later.
- Overhead expenses will still be high after the proposed transfer. Will the participating policyholders benefit from a greater portion of overhead expenses being allocated to the non participating fund?
- What are the bonus expectations participating policyholders? What is the planned mixture of reversionary bonuses and terminal bonuses? What is the precedent for the investment policy of the participating fund?

Protection of entitlements and expectations

- It is unlikely that there is much free surplus in the participating fund, so there is no need to protect against the surplus being siphoned off. The greater concern is whether sufficient capital and support will be allocated to participating policyholders to ensure that their benefit expectations are met.
- The policyholder reserves and backing assets should reserve for future bonuses which are at least consistent with the assumed policyholder expectations.

- It is not reasonable for InvestLife to commit to selling participating business indefinitely, but it will be of comfort if the business plans for the amalgamated company show clear intentions for expanding the participating business.
- InvestLife could guarantee the maximum level of expenses which will be charged to the participating policyholders fund.
- InvestLife could guarantee a minimum level of bonus rates indefinitely or for a specified period.
- InvestLife could guarantee that the shareholders' entitlements be limited, for example to only 5% of surplus instead of 10%.
- As part of the scheme of amalgamation, InvestLife could top up the surplus in the participating fund to a level which will allow for a long term growth oriented investment policy.
- InvestLife should undertake not to reduce surrender or loan values.

[1 for each point, max 12]

iii) The legislation requires that the regulator must approve such a transfer. List the other regulatory requirements relating to such a transfer which you would expect in order to protect the interests of the policyholders of both insurers as well as the public interest.

- No business shall be transferred from one insurer to another, or amalgamated with the business of another insurer except under a scheme of transfer and amalgamation which has been approved by the regulator.
- The scheme must set out the terms of the agreement under which the transfer or amalgamation is to be effected.
- The insurance companies must lodge such documents as the regulator may specify, including
    - up to date accounts
    - actuarial valuations
    - report on the scheme by an independent actuary
- The regulator should have the power to require that details of the scheme of transfer or amalgamation be available for inspection, be published in the press, or be provided to every policyholder affected by the scheme.
- Any affected policyholder should have the right to be heard by the regulator on any concerns or objections.
- Reasonable time must be allowed for the completion of all the formalities and for proper scrutiny of the scheme by policyholders and the public before the regulator approves the scheme.
- On completion of the transfer and amalgamation the insurers should provide reports, certificates or other documents to show that the process has been carried out in accordance with the scheme as approved.
- The amalgamation may be to rescue an insolvent company. This can be in the public interest even if policyholder benefits have to be reduced. For this reason the regulator needs the power to approve the scheme in certain circumstances even if policyholder entitlements are adversely affected.

[1 for each point, max 5]

iv) List the information that an independent actuary would need in order to prepare a report on the entitlements and expectations of policyholders under the proposed scheme.

The independent actuary will be concerned to see that the interest and entitlements of all policyholders have been properly allowed for. This is particularly so for participating policyholders where a much higher level of company discretion applies.

He will require information from both companies as they are, but also business plans and projections for the merged entity.

Financial statements:
Draft scheme of amalgamation and transfer
All balance sheets, revenue account and profit and loss account back to commencement of operations.
All actuarial reports and abstract
All appointed actuaries' reports to the regulator
Financial condition report to board
Board minutes
Projected balance sheet, revenue account and profit and loss account for each company prior to merger
Projected balance sheet, revenue account and profit and loss account for the proposed new entity
Schedule of assets
Existing and proposed investment policy

Product details:
File and use applications, premium bases, surrender value bases, profit testing results
Brochures
Benefit illustrations
Annual statements/bonus statements sent to policyholders
Grievance procedure and complaints register
Claims register and repudiations
Historic and planned new business sales by product and distribution channel
Plans for new products in the combined entity
Reinsurance arrangements and treaties

Experience:
Lapse and discontinuance experience by channel and product
Product mix, age, term, single, regular, average premium
Expense analysis
Mortality experience
Investment performance by fund
Asset/liability investigations
Asset share investigations
Supportable bonus investigations and bonus recommendations

Distribution:
InvestLife distribution agreements with banking partners
Commission scales and agents' agreements
Branch locations
Numbers and productivity of agents
Agent training program
Compliance/internal audit on sales practices

[½ for each point, max 12]

v) You are an actuary employed by the regulator and you have been asked to prepare a report on the proposed transfer and to recommend whether or not the regulator should approve the scheme. Describe the factors you would consider in your report.

There are several objectives for the regulator in this situation:

- ensure the ongoing suitability of owners, directors and management with the change of ownership and control

- ensure that the ongoing entitlements of policyholders and the solvency of the companies are not reduced
- ensure that no policyholders are disadvantaged by the transfer and amalgamation
- facilitate the orderly withdrawal of an insurer whose shareholders are not committed to the business
- check that the transfer and amalgamation is in the public interest

Suitability of persons :
The financial standing, experience and reputations of

- Shareholders
- Directors
- Management

of both of the existing companies and of the proposed merged company.

Conduct and level of compliance of both TradLife and InvestLife over the last four years in the market place, and in dealings with the regulator. (Good conduct by InvestLife is important, while poor conduct by TradLife would be an incentive for the regulator to approve the transfer.)

Record of transparency and timely cooperation in disclosure.

The considerations here are similar to those for judging the suitability of key people when registering new companies, although in the case of this transfer the regulator would have had the advantage of working with most of the involved parties for some time.

Protection of policyholders entitlements:
Are the interests of policyholders' protected, particularly the participating policyholders from TradLife? (Here I would be drawing on the report of the independent actuary.)

The policyholders of both TradLife and InvestLife must be protected. Neither the security nor the expected quantum of benefits should be reduced.

Is the overall solvency and projected solvency of the proposed merged company strengthened or weakened by the transfer and amalgamation?

Is there proper and clear disclosure of the scheme of transfer to all existing policyholders, and will all interested parties be able to access this information?

Are there satisfactory arrangements for the training of agents in the existing products of both companies as well as the proposed products of the new company?

Have there been any complaints or objections against the scheme, and have these been satisfactorily resolved?

Are there adequate and credible plans for the merging of the business and will the integrity of data and customer service levels be maintained after rationalisation of procedures and systems?

Are there adequate plans and resources for the winding up of TradLife and its eventual de registration?

[1 for each point, max 11]

[Total Q1 50]

2.

i) Comment on the items of experience which may explain why the actual solvency margin has reduced compared with that projected in the business plan.

Candidates should realise that the solvency margin is simply a particular measure of surplus; or that solvency margin is equal to the shareholder surplus plus the policyholder surplus on the supervisory valuation basis *less* the inadmissible assets

In commenting on each item of experience candidates should explain how this is likely to give rise to an increase or decrease in the solvency margin compared with that originally projected.

- New business volumes
  Actual sales have been substantially higher than originally assumed and this will mean the new business strain is higher and therefore the surplus will be lower than planned.
  The mix of the sales may have been different from that assumed, resulting in different charges, commission and reserving from those assumed.
  - average premiums
  - average sum insured
  - average age and term and hence commission
  - product mix (high load and low load variants, new products, guarantees)
  - proportion of riders
- Expenses
  The company has expanded its distribution rapidly and this will have given rise to high costs of setting up branches, recruitment and training before the new agents become fully productive, and faster growth and expense overruns would lead to lower surplus than planned.
- Productivity
  Although the company has grown faster than planned, if agent productivity has been lower than planned the cost of producing each rupee of premium income will have been higher than planned.
- Investment returns
  As the company sells only unit linked business, higher or lower investment returns than planned flow mainly to policyholder benefits and will not have much effect on planned surplus.
  Investment earnings on shareholders' funds and non linked reserves however will flow through to surplus.
- Mortality and morbidity
  If actual claims experience is higher or lower than planned this will flow through to surplus.
- Lapses, surrenders and premium discontinuance
  Higher discontinuances lead to policy charges being lower than expected. This is offset to some degree by releases in statutory solvency margins.
- Change in valuation assumptions for supervisory reserves
  For unit linked business, changes in the supervisory valuation basis will not have a large impact on the non unit reserves.
- Change in solvency reserves
  If the company's calculated solvency margin exceeds the minimum required solvency margin of Rs 50 crores, then the solvency reserves will increase as the in force business grows.

- Change in inadmissible assets
  With rapid branch and distribution expansion, inadmissible assets (fixed assets, office fit out, unrecoverable balances) may be greater than planned leading to the lower solvency margin
- Tax
  Actual tax may be higher or lower than that assumed - increases or decreases in tax rates (such a service tax)
- Dividends paid and capital injections
  Cash dividends paid to shareholders will reduce the solvency margin while fresh capital invested will increase the solvency margin.
- Errors and approximations in the projection models
  - premium mode and frequency
  - seasonality of new business
- Costs arising from business risks
  - mis selling
  - fraud
  - errors in unit pricing

[½ for each point, 1 for each comment, max 15]

ii) You also use the solvency projection model to project the company's shareholder (embedded) value. Apart from the experience items that affect the change in the solvency margin, describe the additional sources of profit which make up the change in shareholder value.

The shareholder or embedded value is equal to the value of net assets of the shareholders fund plus the present value of future profits arising from in force business. (The company only writes non participating business so the complications of shareholders' share of participating surplus do not arise.)

- change in the value of shareholder net assets
  This equals interest on the shareholder net assets at the start of the year plus transfers from and to the policyholders' fund during the year.
  There may also be free assets in the policyholder fund which have not been taken into account in determining the present value of future profits, and if so these would be included along with the shareholder net assets. [1]
- unwinding of the risk discount rate
  The present value of future profits at the beginning of the year will increase steadily over the year as the time of the future payments draws closer. The rate of increase is the risk discount rate and the process is known as "the unwinding of the risk discount rate". [2]
- dividends paid to shareholders (or transfers to policyholder funds)
  For non participating business this is the planned shareholder transfer for the year plus or minus experience effects for the year. [2]
- change in the present value of future profits relating to future years following the year under investigation
  A major component of this will be the value of new business. Other changes will be due to differences in experience. [2]

change in valuation basis for reserving or the projection basis for the embedded value
The projection basis may be different from the reserving basis. (In particular, the discount rate for embedded values may be higher, or may be the sole item in the basis to change.)

[1]

[total 8]

iii) Detail how your projection assumptions for the model would differ from the assumptions used to set supervisory reserves.

- The assumptions for supervisory reserves are prescribed and influenced by regulation and professional guidance notes issued by the Actuarial Society of India.
- Supervisory reserves include specific prudential margins by allowing for Margins for Adverse Deviation in the assumptions.
- The projection assumptions would be best estimate assumptions of the most likely outcome.
- As the company writes only unit linked business, the valuation assumptions for supervisory reserves really only affect the non unit reserves. The assumptions for the projection model affect everything.
- The non unit reserves are not very sensitive to the discount rate or mortality rate used, although the assumptions for future expenses can be significant.
- For supervisory reserves, the assumed investment earnings flow through to the assumed future unit price and hence to the investment management fees charged.
- For the projection of the solvency margin however, the assumed investment earnings on the shareholders' fund is likely to be quite significant.
- The supervisory assumptions may ignore lapses as this might reduce supervisory reserves (by releasing reserves for future expenses.)
- The projection assumptions would most likely make allowance for lapses as a best estimate build up of assets and liabilities is required.
- Policy maintenance expense assumptions for supervisory reserves are likely to be a cautious estimate of long term expense levels. For the projection model however, expenses are likely to be actual current year budgeted expenses including cost overruns.
- **[1 for each point, max 10]**

iv) One of the directors has studied your review of the company's results.

a) He has noticed that the increase in the embedded value (profit) is less than the decrease in the solvency margin (shareholder investment). He has asked you if this means the company has made a loss in spite of the rapid growth in new business.

b) He has also asked you what the effect of the rapid growth in new business will have on the appraisal value of the company.

Prepare a draft reply in point form.

a)

- Until the company has generated sufficient volumes of new and in force business to cover the expense overheads, the expense allowances in the premiums will be insufficient to cover the actual expenses.
- The resulting expense overruns mean that the acquisition of new business is currently at a loss.
- The required solvency reserves are deducted when determining the solvency margin although they are still a component of value to shareholders, so the losses are reduced to that extent. [3]

b)

- The appraisal vale is equal to the embedded value plus the value of future new business.

- The future rates of growth of new business are hard to predict with confidence and the high growth rates of a new company must slow over time.
- The appraisal value is usually calculated as a multiplier of the value of the most recent year's new business, and setting this multiplier is very subjective for a recently established rapidly growing company.
- If the planned future growth of the company can be maintained with confidence then the justification for using a higher multiplier can be made and this will steadily increase the appraisal value. [4]

[7]

v) Describe how the process of calculating unit prices can be a source of risk to an insurance company.

- The main risk is that different groups of policyholders will not all be treated equitably and that their contractual rights or reasonable expectations will not be met due to:
  - errors in the calculation of prices at which units are allocated to or redeemed from policyholders
  - errors in the calculation of the prices at which units are created or cancelled
  - the way that compensation for errors or inequalities of a material size is determined.

- The basis for determining the value of the assets depends on whether the company is a net allocator or redeemer of units. There is a risk that the company does not change the pricing method as the company changes from being a net allocator to a net redeemer and vice versa.

  With a rapidly growing unit fund, more policyholder money will be flowing into the fund (buying units) than is flowing out of the fund to pay benefits (selling units). The company will be a net allocator of units (sales of units to policyholders) and be a net creator of units (purchases of additional assets to back units).

  This means that the company must price the units with reference to the price of buying assets (the bid price) and not the price at which assets can be sold (the sale price).

- Where the fund is taxed, allowance for tax on unrealised gains and losses may be out of date or incorrect.

- Use of last price for surrenders instead of forward price means that anti selective surrenders may occur if the units redeemed have a lower value than the last unit price due to a fall in the value of the underlying assets.

  Usually when the change in unit price from day to day is not dramatic, and when the long term trend of the unit price is upwards, there is no incentive for anti selection if forward prices are used. The problem arises when there are sharp falls in the market value of assets.

- Information other than that relating to the asset values may be out of date or incorrect such as accrued income, and charges and expenses.

[10]

[Total Q2 50]