Institute of Actuaries of India

Subject SA1 – Health and Care Insurance

May 2009 Examination

INDICATIVE SOLUTION

Introduction

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

Question 1) i)	
1. Principal purpose of regulation is to protect policyholders. The Regulations should be set out in a way that can be easily viewed by all and uniformly interpreted.	
a. Prudential regulation, which is required in order to mitigate the likelihood that a company cannot meet its claims as they fall due. There should be clear regulations specified that apply to companies in a start-up mode (i.e., proper licensing requirements) and separate regs that govern ongoing concerns.	
i. Assets	
1. Set limits on assets that may be held or counted	
2. Specify valuation basis of assets	
ii. Liabilities	
1. Set restriction on valuation bases	
a. Minimum risk margins in assumptions	
b. Prudent basis overall	
iii. Minimum capital requirement: Start-up vs. ongoing very important	
1. Consider in conjunction with liability valuation, to take total balance sheet approach	
2. Provide trigger for regulatory intervention if capital requirement is breached	
3. May be related to the quality of risk management of the insurer, i.e. its ability to withstand adverse experience given the risk characteristics of its various product lines	
b. Conduct of business regulation, whose purpose is to ensure policyholders are not treated unfairly.	
It is required because the complexity of the insurance product is often such that there is a risk of a significant disparity among the levels of understanding on the parts of the product providers, distributors and policyholders. The policyholder in particular can be taken advantage of.	
2. Means of regulation	
a. Create or authorise an existing body to regulate health insurers	
b. Prudential regulation may be achieved through a regular process of:	
i. Certification of balance sheet by auditors or by an appointed actuary	
ii. Periodic reporting of the balance sheet to the regulator	
c. Conduct of business regulation may be achieved by:	
i. Approving	
1. The disclosures made to policyholders	
2. The product designs	
3. The pricing of products	
ii. Requiring distributors to undergo mandatory training and accreditation, subject to an examination iii. Conducting Market Conduct Audits to assure proper application of the regulations by the company	
Question 1) ii)	
1. Exposed to risk, (i.e., counts of insured lives and the associated premium), sub-divided by:	
a. Product type	
b. Sex	
c. Age	
d. Region	
e. Sales channel	

f. Policy type	
g. Policy size	
h. Duration	
i. Reinsurance category (retained or ceded)	
j. Excess level or other method of cost sharing	
k. Underwriting method	
l. Group size	
m. Industry	
2. Claims data, sub-divide to correspond to exposed to risk categories	
a. Mortality, split between pre- and post-claim	
b. Morbidity split by incidence (frequency) and cost	
i. For medical expenses, health cash and pre-funded long term care, split experience by medical provider and medical procedure specify diagnoses and procedures according to ICD-10 coding structure	
ii. For Critical illness, experience will be split by cause of claim	
iii. For income protection, the experience of recovery rates will need to be reported, split by:	
1. duration	
2. age	
3. sex	
4. incapacity	
5. replacement ratio 6. Other variables used in rating/ underwriting, such as Industry or Occupation, etc.	
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Question 2) i)	
The principal risks are as follows:	
1. current level of claims are not readily estimated or controlled	
a. cost per claim	
b. claim frequency	
To mitigate this risk:	
Get relevant data from:	
• Reinsurers or consultants	
• Health providers	
• Other similar markets	
Control claims costs by	
• Cost sharing with policyholder through fixed deductibles. This will discourage small claims.	
• Define inner limits on the benefit structure, such that maximum claims are defined for given procedures	
o Though it will add to the risk that the policyholder does not understand the benefits	
o It will also add to the risk that policy does not meet the need	
• Define aggregate limits to claims costs, either over lifetime or per annum	
• Agree tariff rates for covered procedures costs with selected providers	
o Though this will be difficult because	
▪ Small portfolio => weak negotiating position	
▪ Fractured network of health providers => many negotiations	
▪ Imbalance of supply and demand => weak negotiating position	
Share risk with policyholder	
• Make premium rate reviewable so that policyholders share the risk	
o Increases risk of policyholder misunderstanding	

o Increases risk of lapsation when rates are reviewed, in particular selective lapsation	
o May be an issue with PRE if claims levels are mis-estimated but policyholders subsequently have to bear a cost. In particular, there may be a perception that the policyholder was falsely induced to buy the contract.	
2. claim inflation is not readily estimated	
a. health cost inflation	
b. claim utilisation rate	
Mitigants	
• design reviewable premium rates	
o medical inflation is expected to be higher than CPI or WPI; therefore extent of risk may not be understood by policyholder	
o risks of policyholder misunderstanding can be mitigated by	
▪ disclosures at point of sale and engagement over the course of the contract	
▪ sales training and compliance	
3. changes in treatment procedures	
• Excluded procedures may come to be redundant in any case, and new procedures may require to be excluded in future	
o Retain right to review terms and conditions	
o Problematic as policyholders and regulator may not agree to reductions in cover	
4. claims management	
• office has no expertise in managing health claims	
o it could hire expert staff, but for a small office, this is likely to be an expensive additional cost	
• outsource administration to specialists (TPA)	
o loss of control of claims process, leading to potential problems in	
▪ claims underwriting	
▪ customer service	
o SLA will be required with TPA	
5. longevity risk	
• product is whole of life but with limited premium paying term => the longer people live, the more benefits will be paid	
• risk is exacerbated because older lives assured would be expected to incur higher aggregate claims	
• the risk further exacerbates the risk of claim inflation: because premiums will not be chargeable in old age, the principal risk mitigant, reviewable premiums, will not be available	
6. asset liability mismatch	
• the liabilities are long term in nature, so the assets should be too	
• a substantial reserve will be built up by the time premiums cease so mismatch risk will be significant	
• given the long duration of liabilities, it may not be possible to match them with bonds	
• some real assets may be held, both to extend duration and also to hedge long term inflation risk	
• liquidity will also have to be maintained as claims will be payable from immediately after any waiting period	
7. volatility of claims at inception of the portfolio	
• relative to the capital of a small company, this could be significant	
• business volumes need to be controlled so that the portfolio remains small relative to the rest of the company's business. However, the business will need to hit a critical mass if it is cover its fixed expenses.	

• Stop-loss reinsurance may used to control the volatility of the retained risk	
Question 2) ii)	
Greater transparency of product can be used to manage risks of policyholder misunderstanding	
Policyholder can take longevity risk because policy can be designed to cease if unit value falls to zero	
• This will require careful disclosure at point of sale so as not to misrepresent the policy	
• Policyholder will be responsible for contributing sufficient funds to provide for an adequate fund by the time premiums cease	
o Policyholder may not have enough understanding to enable him/her to make sufficient contributions. If the fund is too small to small to provide cover, and hence policies terminate quickly thereafter, the company's brand will suffer	
• The asset mix is in the policyholder's control. But the policyholder may not have sufficient understanding to invest the funds for the optimal long-term benefit. Once again, the company, while not running a direct financial risk, will run a reputational risk.	
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Question 3) i)	
Achieved Profits Method (APM) profit is the change over a year in the estimated value of future shareholder transfers, plus this year's transfer to shareholders.	
It is therefore necessary to assess the value of future transfers at the start and end of a year.	
Make estimates of each element of future experience that will affect the transfers to shareholders, such as investment returns, claim and withdrawal rates, and expenses	
Using these estimates, project the future transfers to shareholders arising on the in-force business. Since all surplus is distributed to shareholders, the profits valued are those that emerge in excess of the statutory reserves that are projected to be required.	
Discount the estimated future transfers to the balance sheet date, to give the shareholder value.	
Any shareholder value in respect of free assets in the long-term business fund would also be included in the total shareholder value figure.	
The recognition of APM profit should be controlled by: • including risk margins in each of the projection assumptions • including a margin for risk in the discount rate used, or • a combination of both.	
The margins should have regard to the uncertainty attaching to each element of future experience and the risks of the business.	
Maximum of 6 for this section.	
Question 3) ii)	
Statutory returns incorporate prudent margins of future experience; achieved profits will not incorporate such prudent margins, but will allow for the risk of poor experience by means of a risk margin in the discount rate.	
Statutory returns are designed to provide assurance to the regulator and to policyholders that claims will be met; achieved profits is designed to indicate the realistic value of a business to the shareholders.	
Statutory returns therefore typically give rise to losses (new business strain) on the writing of new business. The statutory profits subsequently emerge over time as experience turns out to be better than assumed. Achieved profits methods allow the recognition of profits at inception of a contract. Subsequent profits reflect the variations between actual experience and that assumed.	
Question 3) iii)	
The principal assumptions are:	
• Claims rates for each of the two products	
o In particular any changes in expected utilisation rates	

• Lapse rates	
• Expenses allocated to health	
o In particular, allowance claims expenses for the hospital cash, where claims are frequent	
o Allowance for claims expenses in critical illness, which may require some claims underwriting	
• Expense inflation	
• Valuation basis	
o Margins for adverse deviation	
o Allowance for premium reviewability in the light of emerging poor experience	
• Risk discount rate	
• Investment returns	
Question 3) iv)	
The valuation will depend on the quality of analysis and data supplied.	
• There are no independent means of checking the accuracy of the analyses of experience.	
• There may be limited information as to the profile of the insured population by age/sex/socio-economic group. Hence it may be difficult to construct any benchmark of expected claims experience.	
• There may be limited information as to the quality of claims underwriting. Any change to this would have a significant effect on the valuation of the portfolio.	
There are no independent means of checking the expenses allocated to health business. However, the purchaser will be more interested in the application of its own assume expense loadings to the portfolio.	
The substitution of the purchaser's expense loadings for the seller's would require estimates of the duration of the liabilities to be transferred. The estimate of this may be speculative. It will depend in particular on future lapsation, which may be affected by a transfer of business.	
All (modelling) assumptions should be stated, and their significance indicated, e.g. by means of assessing the sensitivity of the result to the assumption.	
Question 3) v)	
On the suggestion that the portfolio be purchased if the purchase price is less that the achieved profits valuation:	
• The valuation on the achieved profits basis is only an estimate. There will always be some margin of error to any such estimate.	
• Company B should therefore assess a reasonably foreseeable range of outcomes before deciding on the purchase.	
• Purchase of the portfolio would require capital, since	
o cash, which is a regulatory asset will be spent in acquiring the portfolio, but its value will be future profits, which is not a regulatory asset	
o whether or not purchase should therefore depend on the availability of regulatory capital	
On the suggestion that the purchase be financed in p[art by the issue of senior debt:	
• the expected return on equity would be enhanced	
• the company will increase its gearing and hence its risk exposure	
• the increased expected return on equity should be seen as compensation for this extra risk	
• the cost of the senior debt will reflect the risk attaching to it	
• the risk discount rate reflects the risk in the health portfolio	
• if the risks are different, one would expect different rates of interest. Since the interest rates reflect different risks, they are not comparable.	

Question 3) vi)	
Company B may	
• raise equity capital	
• raise subordinated debt	
• raise a contingent loan	
o where the repayments are to be made if the anticipated surpluses emerge from the transferred portfolio	
• use financing reinsurance to raise regulatory capital	
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[Total 100 Marks]	
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