

Actuarial Society of India

Examinations

November 2006

SA1 – Health and Care Insurance

Indicative Solution

[1]

(i) Before we analyse the market for health and care in India, it would be understand the strengths of the parent companies involved in this joint venture.

Parent company's expertise

- Core expertise in health and care in the parent country
- Has the international company acquired any experience in launching such Greenfield operations in other countries – more so, in any of the Asian countries
- What is the level of expertise in launching such international operations and what is the level of commitment from the parent company (with regard to manpower resources, administration systems, training etc) in launching a health and care company in India
- Products launched by the company in the parent country and its suitability in India
- Lack of expertise in the typical products that are sold in India
- Administration systems used in the parent country in managing its product / policy portfolio and its applicability in India – will any inefficiencies in the administration system pose any problems in developing and managing a product in India

Local partners strengths

- What are the strengths of the local partner (brand image, nature of business, distribution strength, management capabilities, ability to infuse capital as and when required etc) which could be utilised

The following areas would be amongst those considered in assessing the market for the launch of a health and care company in India:

Market for critical illness and income protection insurance in the country***Consumer demand***

- will customers buy in sufficient quantity to make viable
- what drives customers demand
- is there a genuine understanding of the need for health products or is it driven by tax sops
- will products fit a need
- are customers aware of this need
- are products affordable
- could carry out a survey of consumers
- impact of personal taxation (current and possible changes in future)

Consumer confidence

- in the company/brand
- in the product

Level of competition

- fit with existing products
- will the products be revolutionary or similar to any already existing
- is there a gap in the market for this product
- have there been any previous invaders from outside and, if so, have they been successful

Profitability of players

- if they are not making money, why
- can we make money and if so, how

Availability of data

- are suitable data to price the contract available
- are data relevant to product and target market

Availability of capital for a new product

- expense overruns
- new business strains
- solvency requirements

Availability of capital for a new company

- contingency plans

Potential distribution channels

- will you be able to sell the product
- how easy is the product to sell
- what are the different distribution channels used by the existing players
- productivity in each channel and cost of per unit sale
- is there any potential to use existing distribution channels more efficiently
- is there any potential to use any other form of distribution channel
- are there any regulations that restrict use of a particular distribution channel
- do we need to substitute existing products or repackage them in a way so as to enhance sales efficiency

Regulatory issues

- issues with regard to licensing of insurance companies
- what are the regulatory concerns when new companies seek license and how such concerns can be addressed
- who is allowed to sell health products
- can similar products be sold by life, non life and health companies
- can life, non life and health products be bundled
- can life, non life and health companies tie up to provide tailor made product solutions to certain customer segments
- any restrictions on product design or investments
- product approval processes – a in-depth understanding of the file and use procedure
- need for relevant supporting documents that might be required by the regulator for product approval
- solvency margin requirements
- reserving requirements
- financial reporting
- any regulation of distributors/sales processes
- ability to repatriate profits

Legal issues

- contract law
- employment law
- insurance act and other relevant regulations, circulars from the regulator, tax authorities etc.
- legal environment : claims ombudsman, consumer courts, appeal procedures etc

Availability of key staff and systems

- administrative and claims systems
- key staff
- availability of service partners (*e.g.* TPAs, Medical service providers)
- possibilities for outsourcing

Reinsurance

- willingness of reinsurers to support business;
- expertise of reinsurers and their track record in supporting new companies / innovative products
- service levels of reinsurers – do they provide full range of services from product development to claim administration
- availability and cost
- any opportunity or restrictions on the use of reinsurance to optimize risk mitigation
- any opportunity or restrictions on the use of reinsurance to enhance capital efficiency

State provision

- what employee benefits are available
- what is currently provided by the State and to which segment it is available
- how well the proposed products fit the state provision
- medical provision system of hospitals and doctors (referrals, reports)

Demographics and earnings levels

- demographic projections
- earnings levels and projected growth
- influence on choice of products and distribution methods
- market segmentation and projections for each of these segments (more so the target segment)
- need for product differentiation based on demographics and market segments

Culture

- impact on the product claims experience
- presence of non disclosure and its effect on claim management
- presence of unfair sales practices and effectiveness of regulations that monitor sales practices
- internal and external frauds

Others

- approach to product design and launch, modeling and profit testing
- levels of corporate taxation
- currency considerations/volatility
- comparability with alternatives of company purchase and soft branding

(ii) Setting assumptions***Morbidity***

The company does not have any experience in managing a portfolio of CI or IP contracts in India. Hence care should be taken to “import” results of any experience from portfolios managed outside India.

Use of company’s data in the parent country

- Perform an analysis of own company experience over a suitable recent period 3-5 years may be suitable depending on volume of data credible but homogeneous
- Split analysis into major different risk groups *e.g.* male/female, smoker/non-smoker
- Adjust data for other possible influences which will affect its immediate usage *e.g.* past changes in underwriting standards or claims management.
- Compare own data with that from other sources over the same time period, in both the home market. This data could be industry wide data *e.g.* from insurers associations or from hospitals.
- Companies tend to adjust such experience from overseas to adapt it to Indian conditions. One such method is to use the relationship between mortality statistics from the parent country and India, and using such a relationship to derive incidence rates for CI. However, adequate care should be taken in adapting such overseas experience to derive incidence rates for India.
- Assess the level of adjustment needed to the local data (which may be more plentiful) to make it relevant to the prospective overseas market. Ratios may be appropriate initially but margins will be needed.

Use of published tables from the parent country

- Published tables based on insurance experience, if any.
- Assess the adjustment needed to relate any published data, which may not be underwritten, to the particular circumstances of the company, its products and target market.
- Analyse trends in experience by age, sex, smoker status.
- For CI, if data permits, analyse risk premiums and trends by specific diseases.
- For IP, analyse claim inception and claim termination rates. If data permits, investigate by occupational classes and deferred period.

Use of Population statistics

- Population figures and government health statistics.
- However, proportion of smokers and non smokers, proportion of female and male lives might be different in the insured portfolio.
- Need to adjust the population rates for these as well as for target market induced class selection and medical selection.

Use of reinsurers data

- The other source of data is from reinsurers.
- Investigate the availability and cost of reinsurance arrangements of various sorts *e.g.* risk premium, original terms. In a new territory, company may wish to reinsure a significant proportion.
- May base premium terms on reinsurance rates, subject to the above analyses.

General adjustments

- Need to investigate potential impact of AIDS/HIV
- Further adjustment needed to align different target market in the overseas territory with that underpinning the base data.
- Adjustment may also be needed for differences in potential size of policy.
- Need to include reserving basis among pricing assumptions, affecting cash flows.
- Will probably use adjustments to a standard table for improvements, with the adjustments derived from the above analysis. Need to allow for deterioration also.
- Lack of IP products in India which could pose serious problems in deriving incidence rates for IP products. One possible method is to derive incidence rates for each cause of IP claim (permanent / partial disability, health impairments, critical illness etc) and then add margins to derive incidence rates for stand alone IP products. Reinsurers support might be sought to design, price such a product and in efficient risk management.

Mortality

- Carry out similar analysis to the above. Data needs to be interpreted with care.
- For IP, need to split pre-claim and in-claim mortality.
- For CI, need to split pre-claim and post-claim (survival period) mortality. Other deaths from critical illnesses covered will be irrelevant, because a claim has already been paid.
- Need to avoid double counting in cases of accelerated CI.

Investment

- Assess the level of potential investment return on the assets backing this portfolio,
- dependent on where the assets are held. Allow for currency differences. Include net of direct investment expenses.
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Expenses

- Start with company's most recent in-house expense analysis. This would have been carried out as a part of feasibility study or during the preparation of application for a license. Allow for trends if such an exercise is out dated.
- Allow separately for acquisition (sales, marketing and underwriting), servicing and claims costs
- Allow separately for IP and CI
- Include both head office and overseas territory costs
- Claims costs will be split between initial claim validation (CI and IP) and ongoing claim maintenance (IP).
- Need to include any cost of outsourcing (to TPA), administration systems and claims management costs
- Split policy costs into those that are premium related and those that are per policy.
- Need to understand the extent to which specific one-off costs (*e.g.* establishment overheads) and expected additional costs (*e.g.* regulation) are to be costed against individual policies.
- Degree of detail will depend on size of company and volume of expense information
- Reinsurers will be able help with certain expense information *e.g.* cost of obtaining medical evidence and its likely impact on premium rating.
- Need to analyse and project the impact of inflation in the two countries (as a part of costs are due to support from overseas).
- Inflation may need to be split between manpower costs, future equipment costs and others. Projected inflation may possibly be measured as difference between government fixed-interest and index-linked securities.
- Adopt consistency of assumptions between investment returns and expense inflation

Commission

- Investigate levels of sales reward to be paid to the distributors in the new territory.
- Impact of service tax on commissions
- Load directly into premium basis. May need some adjustment if there are volume related
- overrides thus dependent on new business forecasts

Lapses

- Analyse home experience for CI and IP products
- Limit scope of analysis to experience produced by the distribution channel which will sell the healthcare products abroad. Else (or as well as) obtain industry data if available for these healthcare products and this form of distribution
- Adjust data if target market is different from those underlying the above researches
- Further adjustment may be needed if past period of data collection was influenced by unusual economic circumstances, or any other abnormal historical situation
- These results could only be used as a indicator of differences in lapse rates among various distribution channels.
- Check with reinsurers / third party administrators whether they could provide an input on lapse rates
- Check whether the sensitivity of profits to lapses (is the product lapse neutral?)

Tax

- Make suitable assumptions as to the insurers current and future tax position
- Make allowance for any tax liability in overseas territory, including premium/service tax

Profit

- Include company profit criteria, commensurate with underlying risk of venture risk discount rate, PVFP, pay back period.
- Include cost of capital due to solvency requirements. Also check whether there are any opportunities to lower capital costs through reinsurance.
- Need to have a broad understanding of the profit levels that are attained by other companies in India.

Sensitivity analysis

- Determine which are the key assumptions that would affect volumes, contract size, expenses and hence profits
- Test the sensitivity of the final premiums to adjustments in the individual assumptions and refine inputs accordingly

Competitors' rates

- Research competitors office premium rates to assess levels of new products then adjust assumptions if deemed appropriate.

Assumptions and strategy

- The values of the assumptions and the premiums that they produce will reflect the company's strategy in launching into the new market
- An aggressive growth strategy may require assumptions stripped of margins.
- A slow portfolio build strategy may permit more caution in the assumptions.

[30]

[2]

a) Immediate-needs long-term care insurance (LTCI)*Underwriting*

This policy is effectively an index-linked impaired life annuity. Heavy mortality experience will benefit the insurer, although this will depend on the significance of any death benefit.

The insurer would normally charge a premium based on the individual health status of the proposer. In order to assess this, they will need to collect detailed medical evidence, but this will be costly to do for each applicant.

An indicative quotation could be obtained, based on the answers to a small number of questions on the proposal form.

Activity-based, or functional ability, tests might be carried out to assess the applicant's level of disability.

If the proposal goes ahead, further medical evidence could then be obtained, from the applicant and his or her doctor. This would be used to given a final premium for the individual concerned.

It is important that evidence is gathered and a decision is made quickly, because the applicants will be in need of care at the time of the proposal.

The use of medical examinations should be kept to a minimum as this is probably an unnecessary cost and would lead to further inconvenience for the proposer at a difficult time.

Reinsurance

Reinsurance will help:

- protect against claim volatility, which will be uncertain, since this is a new product and volumes of business will be small.
- provide technical assistance, *e.g.* data for pricing and help with underwriting.
- provide capital for the launch.

The insurer is likely to arrange quota-share reinsurance, probably on original terms, in order to build up experience the first few years without taking too large a risk.

Distribution

The typical applicant is likely to be reasonable wealthy (*i.e.*, able to afford a high single premium in order to protect his or her assets) and financially sophisticated. For example he or she is prepared to pay a high single premium, and may be seeking this insurance in order to protect his or her assets.

However, they will be elderly and already in need of care.

IFAs could sell this business, but specialist brokers may be best. For example, they will need to have the skills to obtain the necessary medical underwriting information, some of which may be sensitive.

The target customers will also value face-to-face advice, and may wish to have someone who will “shop around” to get the best price for them. Brokers with whom customers are in regular contact may provide the best opportunities here.

The insurer could develop its own sales force, but this would be costly, and risky if it proves to be unpopular. It may be difficult to find the people requiring this product, as the insurer does not have an existing sales force with which to cross sell.

Tied agents may be persuaded to sell this business, if the terms were right. A tie-up with an organization providing long-term care, or providing advice to elderly people, would be ideal if it could be arranged.

Costs and risk

If the insurer is new to writing annuities there will be significant costs associated with setting up new systems, *e.g.*, to pay annuities.

Even if the insurer is already writing annuity business, there will be changes required in the areas of underwriting, marketing, sales and pricing

Careful underwriting and assessment of risk will be required to price the product accurately, and this may be essential if the product is to be competitive. This will incur costs.

If underwriting is not sufficiently accurate or detailed the insurer may be exposed to anti-selection risk.

Data used for pricing (or for making the decision whether or not to launch the product) may be inappropriate for use on this type of business (*e.g.*, based on normal, rather than impaired mortality), and the adjustments made may be inaccurate.

b)

(i) Analysing experience

A key variable in the analysis is duration in force. We would calculate the numbers of policies still in force at each duration as a percentage of policies originally written in the group.

We would have considerably more data for shorter durations in force than for longer ones. We would have no data for durations above eight years. However, longer durations are of less concern because it is usually easier to set withdrawal terms to produce an acceptable overall profit.

We might consider older types of health products to give us longer-duration data, but this may not be appropriate for the current type of contract.

In particular, the non-linked version of the product may give an indication of withdrawal rates.

However, the experience is likely to differ dramatically due to:

- no withdrawal benefit being paid.
- Different definitions of allowable claims.

One problem is that, because of the falling volumes, the bulk of the shorter duration data is from many years ago and may no longer be relevant.

We would want to analyse the direct sales force and FA data separately.

Other possible classifications include:

- payment method
- premium frequency
- original term of contract
- size of benefit
- sex
- age
- occupation

However, there is unlikely to be sufficient data to split the data by all these factors.

We might also wish to study trends. Again the volume of data may be a problem, especially for recent years.

Reinsurers and consultancies may be able to help with general trends.

Alternatively, there may be industry-wise data available, although this is unlikely.

Any such trends would have to be interpreted carefully, because they may have been affected by:

- changes in economic conditions, including investment performance
- publicity for critical illness contracts
- changes in the generosity of the withdrawal benefit
- changes in competition

(ii) Re-pricing

The results of the analysis would have to be used with great care, and may need considerable adjustment to be suitable for current conditions.

In particular, allowance would need to be made for the factors mentioned above (economic conditions, publicity, *etc.*). The company would have to take account of its expectations for the future in adjusting the past data.

It would also have to take account of any expected legislative changes, *e.g.*, the tax treatment of products (although this is very difficult to predict) and commission structures.

If the company prices the product differently for the two distribution channels then it would need two sets of withdrawal assumptions. If the prices are the same, but expenses are different, it will need an assumption for the mix of business (so overall the current allowance for withdrawals can be made).

Because of the high level of uncertainty, the company should sensitivity test the withdrawal assumptions. This is less necessary if the company can set withdrawal terms so that it is relatively indifferent to withdrawal rates. Competition may limit this, and early withdrawals are always likely to lead to a loss.

(iii) Supervisory Valuation

There would not normally be a withdrawal assumption in the supervisory valuation.

The non-unit reserve would be calculated so as to eliminate any future negative cashflows on the policy, effectively an assumption that even with 100% withdrawals at any time in the future, the company will have sufficient reserves/

[35]

[3]

A general comment : Reducing premiums will reduce profit per case unless accompanied by actual change in practice of company.

Change rating structure/target lower risk business

- Focus on a different (profitable) target group : Age / sex / geography / lifestyle / class of product (stand alone / rider etc) / distribution source / occupation class / anti-selection mortgage purchase
- Will complicate and lengthen sales processes which might reduce new business sales despite cheaper premiums for better risks
- Any change in rating structure should also be reflected in the experience monitoring systems which will have to be considered while costing such monitoring systems
- Will lose business for which rates rise and hence check for rate increases for key target groups

Implement more stringent underwriting procedures

- May increase decline rates and lengthen sales processes.
- Increased cost of underwriting may outweigh benefits of better risk targeting
- Compare this approach with setting the same premium levels with lenient underwriting. This might increase volumes but might increase claims costs and possibly more claims repudiation.

Reduce anti selection effect / over-insurance

- cap replacement ratio. But this may not meet customers needs
- Reduce anti selection effect – for example curb multiple policies
- Reduce over insurance effect - regular policy reviews
- Introduces additional costs into process and costs may outweigh benefits
- Better training of sales teams to reduce anti selection effects / over insurance

Reduce claims outgo

- Reduce claims incidence for a given risk
- Increase exclusions applied but check for regulatory concerns
- Implement more stringent claims control processes
- Change basis of claims payment from own occupation to own/suited or to any occupation
- Decline more claims but check reputation risk
- PRE considerations if claims philosophy not in line with policyholders expectations

Reduce claims severity

- Increase deferred period
- Offer lower expiry age / term
- Limit duration of claims payment
- Provision of temporary annuities could check length of liability
- Reduce or curb escalation of claims paid and provide step down payments
- Introduce linked claims clause to encourage return to work
- Implement rehabilitation services to help claimants back to work
- Implement an early notification scheme to allow early claims intervention
- Offer long-term claimants with high reserves a lump sum in lieu of a regular income

Reduce expense loadings

- Streamline processes
- Redistribute expenses between policies (*e.g.* apply using percentage of premium basis so that higher value policies carry higher expenses).
- This might however lead to a mismatch of incidence of expenses and allocation between policy sizes. (*e.g.* risk that larger number of smaller premium policies sold and expenses not covered).
- Check efficiency and cost implications of in-house claims management against outsourcing

Reduce profitability loading

- Expectation of increased volumes offsetting reduced profit per case
- Elasticity of demand not accurately understood. Increases in volume not as expected.
- Competitor response to lowering premiums results in volumes not increasing as expected.
- Enhance retention and reduce lapse assumption
- Implement a no claims discount but this might lead to high lapse rates following claims

Pay less commission

- Insufficient commission to incentivise sales
- Implement commission claw back
- Increased administration costs associated with increasing level of clawback may outweigh the benefits of doing so

Investment income

- Increase investment income from held funds
- Investment return mismatch risk if deviate from fixed interest securities
- Need to consider whether any regulatory risk associated with mismatch

Reinsurance

- Make effective use of reinsurance arrangements (*e.g.* quota share)
- Make effective use of reinsurance arrangements for better capital efficiency
- Review retentions in light of reinsurance outgo and claims.

Guarantees

- Remove/reduce the level of guarantees in the policy
- Introduce or extend use of reviewable/renewable premiums

Move to unit-linked format

- Admin costs likely to increase significantly

Assumptions

- Weaken margins used in demographic assumptions in pricing
- Risk of pricing assumptions not being borne out in practice
- Without matching reduction in reserving this might also lead to higher strain

General points

- Changes may not meet customers needs
- General issue of costs v benefits

[20]

[4]

(i) Process for calculating the RCR

One method is as follows:

1. Hypothecate assets to liabilities to enable the maximum interest rates to be calculated.
2. Carry out a statutory valuation using appropriate interest rates and other aspects of the basis. The basis used should be the actual basis that would be published in the supervisory returns. (Note that these reserves may be appreciably larger than the minimum reserves that could be published). This produces a value of liabilities, all this value V_L .

3. Remember which assets are hypothecated to the liabilities. The value of these assets (A_1) equal the value of the liabilities (V_1). Forgot about any spare assets.
4. Investigate the effect on the hypothecated assets of the proposed change in circumstances (*e.g.*, $x\%$ fall in equity value, $y\%$ fall in property values and $z\%$ fall in fixed-interest yields). Call the new asset value A_2 .
5. Recalculate the minimum statutory liabilities, after considering the change in interest rates. You can remove any unnecessary margins there may be in the valuation basis over and above those required by the legislation. You may also want to rehypothecate assets between the liabilities because after the change in conditions, a different hypothecation may produce a lower minimum liabilities figure.

In other words, calculate the minimum statutory liabilities after the change. Call this liability figure V_2^{min} .

6. If there is any shortfall (*i.e.* if A_2 is less than V_2^{min}), the RCR will be non-zero. The amount in current terms will depend on what you invest it in.
7. Repeat (1) to (6) for any other scenarios (*e.g.*, same as above but with a $z\%$ rise in fixed-interest yields).
8. The RCR is the greatest of the various amount required to meet the shortfalls.

(iii) Proposed actions to reduce the RCR

(a) Matching assets and liabilities

Probably. Avoiding serious mismatch by term, nature and currency will usually reduce the RCR because asset values and liability values are more likely to move in line if conditions change.

However, if a net premium valuation method is being used, the relative insensitivity of this method means that one might actually reduce the RCR, not by matching, but by investing the assets “too short”, *i.e.*, to match the low volatility of the statutory liabilities.

(b) Holding higher reserves than necessary in the first place

Yes. This means that it is more likely that the assets representing the higher reserves will be sufficient to meet the minimum value of liabilities after the change in conditions.

(c) Reducing the reserves held to the minimum to increase free assets

No. This means that it is less likely that the assets representing the lower reserves will be sufficient to meet the minimum value of liabilities after the change in conditions.

[15]
