INSTITUTE OF ACTUARIES OF INDIA

Subject SA2 – Life Insurance Specialist Applications

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INDICATIVE SOLUTIONS

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.

Q. 1

a) The financial implications will depend on the nature of the distribution channel which might be very different to the existing agency channel because of:

- set up and training costs
- time to achieve viable scale of operations
- additional infrastructure requirements (IT, training, office space, support)
- distribution model – bank staff, direct sales force or agency
- productivity
- commission and other remuneration paid to channels
- products offered and product mix

It will be necessary to build a model to project the financials for the proposed distribution channel.

Because of the high interdependency on the life company infrastructure (new business, policy servicing, marketing, investments, finance and accounting, actuarial etc) the new channel will probably have to be consolidated with the life company, rather than trying to evaluate it as a stand alone component.

The *financial model* will be built up from the following:

- sales model to arrive at sales volumes
    - numbers of bank branches
    - number of bank staff/life insurance agents selling insurance
    - productivity
    - product mix
- expense model
    - set up and infrastructure costs
    - commissions and service fees to bank
    - life insurance sales and training staff to support bank branches
- projection model
    - projected revenue account
    - product cash flow projections including policy liabilities
    - revenue account

Assumptions will be needed about the cost and productivity of the new channel, and about the product mix likely to be sold.

To some extent the bank customers to whom the policies will be sold might be expected to generate better quality business than the agency force. Bank customers might be wealthier than the general population, and individual bank customers will be identified as being more likely as potential policyholders.

The channel related assumptions will include

- product mix (including new products still to be developed)
- average premium
- average term
- premium mode distribution
- lapse and surrender rates
- productivity (eg sales per bank customer service officer per month)

Other assumptions include

- mortality rates
- rate of investment earnings
- per policy initial expenses
- per policy renewal expenses

b) Capital is required for i) risk capital and ii) working capital.

If the move into bancassurance is successful and business volumes can be grown significantly, the relative level of *risk capital* (for market and interest risk, credit risk, persistency risk, mortality risk, operational risk, expense risk, liquidity risk, reinsurance risk etc) may even decrease as the risk base is larger.

It is more likely that *working capital* will be needed to fund the costs of new infrastructure for the bancassurance operation, and to fund increased levels of new business.

Infrastructure costs could include:

- IT support and connection with the bank's network
- point of sales applications
- office space
- support staff for the bancassurance operation
- product development
- marketing and branding

New business funding will be simply proportional to the increased new business volumes hoped for.

Bank invests as a shareholder in the company

- Obviously the new shareholder will have to invest capital to acquire his shareholding
- This will reduce the amount of capital left to be raised
- Both the existing and the new shareholder will have to subscribe the balance

Tie up with bancassurance distributors

- The bancassurance distributor will not contribute any capital. In fact he is likely to want some sort of sign on fee!
- The capital requirements will have to come from the existing shareholder.

Setting the price for the new shareholder

The starting point for valuing a mature life insurance company would be it's appraisal value which is:

- net asset value, plus,
- value of future profits from in force business, plus
- value of future new business

The net asset value is readily calculated as an accounting exercise although adjustments should of course be made where necessary to reflect quality of assets and receivables.

The value of future profits from in force business depends on the assumptions made, particularly maintenance expenses, the discount rate and allowance for lapses. In a sale situation the discount rate will be closer to the buyers cost of capital than to the conservative rate with margins used for a supervisory valuation of liabilities.

The value of future new business is set as a multiple of the value of the most recent year's new business.

It is difficult to agree what the multiplier should be in times of very high industry growth rates such as at present.

Benchmark valuations may also be established with reference to other merger and acquisition activity.

The price at which the existing shareholder is prepared to sell down, and the price at which the new bank shareholder is prepared to buy in will also reflect their respective

- market positions
- brand strength
- customer base
- financial strength

c) Introduce a new bank as a shareholder

- long lead time
- no certainty of success in attracting a suitable investor
- need a successful long term shareholder relationship
- higher level of regulatory approval required
- both parties are exposed to risk of having their reputation tainted by their partner
- the new bank should be prepared to have the insurer as an exclusive supplier, but at the same time allow the insurer to deal with other banks to increase sales

Tie up with independent banks as distributors

- high level of competition to sign up a bancassurance tie up
- bank does not share in the embedded value of the business and will seek higher commissions as a result
- the life company is investing in building the bank's distribution

- bank partner is not committed and can change to another company
- bank partner can even start up their own joint venture in competition
- lower level of regulatory approval required
- both parties are exposed to risk of having their reputation tainted by their partner

d) *Direct sales force:*

Sales process:

- sales staff identify prospects themselves as well as being referred customers by bank staff
- sales staff located in bank branches, or may operate through several branches
- sales staff would be prepared to meet customers at their office or home, and outside of working hours
- professional full time sales staff have a higher level of sales skills

Underwriting:

- trained sales staff employed by the insurance company have knowledge of underwriting
- can be expected to meet and follow up underwriting requirements

Policy servicing:

- closer and longer interaction with customer
- sales staff expect that the customer will direct questions and servicing to them
- may be rewarded on renewal premiums as well as new business

Sales costs and commissions:

- sales staff on a salary plus volume related incentive/commission
- bank receives a commission for giving access to their customer base
- bank staff may receive small incentives for assisting with referrals

Tied agency:

Sales process:

- higher level of commitment from the bank, more suited to a bank as a shareholder than to a bank as a distribution partner
- bank staff identity potential insurance customers themselves and proceed to complete the sale
- the sale needs to be quick and completed immediately, as the bank staff have other responsibilities
- bank branches and bank staff have targets for insurance sales as well as sales of bank products
- bank staff have a lower level of sales skills, objection handling etc

Underwriting:

- low level of underwriting understanding among bank staff
- underwriting slows and complicates the sales process considerably and bank staff will avoid products with strict underwriting requirements
- follow up of outstanding underwriting requirements likely to be a low priority

Policy servicing:

- follow up policy servicing limited to collection of renewal premiums
- any other queries would be referred to the insurance company's policy service department

Sales costs and commissions:

- bank staff likely to have significant rewards for selling insurance, perhaps a modest commission rate or through annual or more frequent bonus
- bank receives a commission for giving access to their customer base as well as providing the staff making the sale
- the insurance company will have to meet the cost of sales and product training

e) Bank staff have many duties and do not have much time to complete a sale.
They are not dedicated, trained life insurance sales people.
Bank staff will not be willing to arrange medical examinations or to follow up on underwriting requirements.
Customers rely on bank staff's recommendations; hidden costs and termination charges are poorly received by both bank staff and bank customers alike.
Bank staff and bank customers understand savings accounts and fixed deposits well and do not understand reversionary bonus products or complex products with lots of choice.
Successful bancassurance results in better quality business at lower cost.
Products offered through the bank channel must compare well with what other banks are offering their customers.

- products must be simple to understand
- the new business process must be simple (few underwriting requirements) preferably with instant policy issue
- high surrender charges are resisted
- very long terms need to be replaced with shorter/medium terms
- products need to be aligned to banking needs, eg mortgage and other loan insurance
- successful bancassurance operations make possible better value, lower priced products

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Q. 2

a) Term and health contract:
Mortality/Morbidity: For the term insurance cover, mortality is the most significant element. Mortality and morbidity risks are inter-related, the longer one survives, the higher the morbidity costs could be. The company has no previous experience on health insurance and hence initially should offer 'fixed' benefits on health events and not reimbursement type products. In health insurance claims handling also is important and the company needs to obtain clear proof of morbidity. Sensitivities of various mortality and morbidity rates should be tested.
It is common to allow CI benefits only on the first occurrence (the CI cover ceases). It is also common to impose an initial no-risk period of 6 months to 1 year for eligibility for CI benefits. Most companies use a waiting period of at least 30 days after a CI event, to establish a CI claim. Due to advances in medical science, CI events are diagnosed much earlier than before and more sophisticated tests are available. Some companies do not therefore offer guaranteed premium rates and retain the right to charge higher CI premiums should experience prove adverse. Also even the definition of the CI illnesses covered and the tests required to prove the event may be subject to change. Similar comments apply for the surgical benefit.
Underwriting for health risks may be different from that for death cover. The possibility of a health claim due to family history, life styles and environmental factors over the contract period may have to be considered. Good underwriting would be essential to control claims. Regular monitoring the claim experience compared to the pricing bases is essential.
Following a health insurance claim, the life may be sub-standard. In some countries, therefore health benefits are offered as riders under an 'umbrella' product, i.e. the death risk cover under the main product would reduce by any health insurance claim and hence exposure to mortality risk is controlled.
There is also a possibility that claim amounts may be inflated if on reimbursement basis. It is usual to impose deductibles (a floor below which claims are not paid) and a co-pay (a % of the claim amount above the deductible is borne by the insured), besides imposing sub-limits for various items such as room rent, medicines, theatre charges, nursing, recouping etc.
Interest: Under this product, liability reserves are likely to be small and may be slightly more than an un-expired risk reserve. Interest rate assumption is not very sensitive to such products, nevertheless to compensate for any mortality or morbidity losses, it may be

necessary to use a margin on the best estimate. The reserves should be invested in assets (mostly debt) suitable for the liability profile, generally of short duration with an appropriate level of matching.

Expenses: The insurance industry in India is experiencing huge wage inflation these days due to non-availability of trained staff. Under non-par products there is no facility to adjust benefits and the main risk is the actual expenses exceed the pricing level. This could be due to inflation or inefficient administration or external reasons. Expenses are usually a significant proportion of the premiums and should be set at an optimal level. Term products are considered 'door-opener' by some companies and only 'marginal' expenses are taken into account. Claim investigation expenses could be significant under health insurance.

Persistency: If lapses are higher, overhead expenses, being dependent on the number of policies in force, could increase. With improving mortality and competition, there is a possibility of a rate-war and while pricing, lapse profits should not be anticipated. Policies taken for general protection could exhibit higher lapse rates as opposed to those taken for specific purposes like mortgage, car loans etc. and the company may attract the latter type of business. Selective withdrawals may worsen the mortality experience.

Others: Mis-selling may be avoided by appropriate sales processes. There could also be other risks such as regulatory.

b) Regulations:

- Liabilities to be determined separately for each contract
- By a prospective method – gross premium method
- Take into account PREs
- Consider options
- Prudent assumption with MADs
- Non-negative, surrender value
- Not subject to arbitrary discontinuities from year to year
- Consider nature & term of assets and liabilities
- Term policies including the subsidiary benefits under the product may require UPR/URR type of reserves as the prospective reserve could be lower than UPR or URR.

c) Regulations: maximize retention; develop capacity; maximize reinsurance protection for a given cost; simplify administration.

Retention limits: would depend on prior experience the company has on the type of business, its financial strength (any financing needs), need for advice/support from the reinsurer.

In general for most life policies, a surplus reinsurance will be used. However the company does not have previous experience of health business and it may be looking for advice and assistance from the reinsurance. Also for the term cover and the other benefits available, the capital requirement (RSM) may be large compared to actual premiums received and the company may consider a quota share to reduce the capital requirements (RSM) and to improve profitability.

d) (a) Level allocation with surrender penalties:

Policyholder money is allocated at a single rate throughout at, say, 90% of premium.

Advantages

- Looks better than nil allocation and is more open than capital units.
- Simple to administer.

Disadvantages

- Exposed to the risk of adverse unit growth since expenses will be partly recouped through the management charge.
- Takes a long time to recoup the expense unless can set up negative sterling reserves.

- Surrender penalty necessary which complicates the policy.
- Negative sterling reserves only of use if there are any positive ones to offset against.

(b) Capital (initial) units

Typically premiums will be allocated to capital (or initial) units in the first two years of the policy and to accumulation units thereafter. Capital units attract a higher fund management charge than accumulation units. Typically this will be 3%–5% above the annual management charge. The additional charge can be anticipated for valuation purposes by discounting the unit liability, provided appropriate surrender penalties apply.

Advantages

- Presentationally better as it allows 100% of the premiums to be allocated from commencement.

Disadvantages

- Seen by many as a hidden charge.
- The office is exposed to risk that future unit growth will be less than anticipated, unless actuarial funding used.
- It is necessary to apply a surrender penalty on capital units in the early years, which complicates the product in the eyes of the policyholders and distributors.
- Two unit prices have to be calculated (and published!).

(c) Reduced allocation

Under this method, little or no money is allocated to purchase units until initial expenses have been recouped. Typically, no units would be purchased for a period of one to two years, after which time 100% (or more) of the premiums will be used to purchase units.

Advantages

- Quick payback of initial expenses.
- Simple to administer.
- Clear and open — charges match expenses fairly closely.
- Surrender penalties not usually necessary.
- Allows profit to emerge quickly and so makes efficient use of capital.

Disadvantages

- Policyholder perception of poor value which may result in lapse in the early years.
- Taking all the margins “upfront” increases the likelihood that a sterling reserve will be required.

e) PRE is relevant when the company is given discretion on over variable charges and benefits. Such discretions should be exercised in accordance with PRE.

The primary expectation of policyholders is that the promised benefits will be paid, and therefore that the company will still be solvent when a claim arises.

PRE is driven by three factors:

- comments made in marketing literature
- the past practice of the company and
- general practices in the insurance industry

Discretion can be exercised on (i) investments (ii) determination of unit prices, (iii) and the circumstances under which variable charges might be altered

(i) In general policyholders expect that investment will only be in asset types disclosed.

(ii) Creation or liquidation of units should be at a price that does not disadvantage other policyholders in the fund.

(iii) Increase in expense charges should be at regular intervals say annual and in line with the company’s actual expense experience.

f) The company would want to analyse the change in value of the shareholders’ interest as part of the control cycle.

Monitoring experience is part of the feedback loop. It enables the terms on which the company transacts business to be reviewed and if necessary amended.
In particular:

- It enables the calculation of the shareholders' interest to be validated while analysis components could also be required as part of a remuneration scheme for Directors.
- Comparison of actual against expected experience assists in the revision of bases.
- The value of new business written during the year is calculated, and the relative values of Rs 1,000 of annual premium for the health and the pension product can be compared.
- Individual sources of profit and loss can be identified and action can be taken where necessary. This information may be disclosed in the commentary in the accounts and in analysts' briefings.
- Unprofitable contracts can be identified, redesigned and repriced or action taken to address unprofitable distribution channels. This builds a better understanding of the products, for example the health product will be sensitive to claims, while the pension product will be sensitive to lapses.

g) This depends a lot on whether the option is conservative or aggressive. If the guaranteed rate is very low, then it is more unlikely that the option will be exercised. And vice versa.
It may also be decided to ignore the option in the embedded values, thereby implicitly assuming that the option will never be exercised.
The important point is that the exercise of the guaranteed option will invariably *reduce* the embedded value.
This may not be appropriate if the company holds a reserve in respect of the guarantee which will have already reduced the net asset value.
The guaranteed option is more likely to be taken up if interest rates fall below the interest rate implied by the guaranteed rate. For example, in today's conditions, the guarantee might be priced at 3.5% pa. The option will then be attractive if at the time of exercise interest rates are only 2.5% pa. This situation will reduce the embedded value as there will be a stream of investment income at 2.5% but a benefit outflow at 3.5%.
Now consider longevity. A conservative guaranteed rate will assume significant future mortality improvements. The guaranteed rate will therefore only be attractive if mortality improvements turn out to be even better than assumed. In fact, this is what has happened over the last few decades as longevity improved far more quickly than anyone anticipated.
Again, if the guaranteed annuity option is exercised, this will *reduce* the embedded value as the stream of annuity payments will be worth more than the proceeds of the accumulated pension policy on the vesting date.
As a development, the embedded value could assume that a certain proportion of pensioners will take out an annuity with the company at the company's market annuity rates at the time. In this scenario, there should be a small *increase* in the embedded value equal to the present value of an immediate annuity issued in *n* year's time.

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