

INSTITUTE OF ACTUARIES OF INDIA

EXAMINATIONS

21st May 2008

Subject CA3 – Communications

Time allowed: 3 Hours (14.15 - 17.30 Hrs)

Total Marks: 100

INSTRUCTIONS TO THE CANDIDATE

1. Do not write your name anywhere on the answer sheets. You have only to write your Candidate's Number on each answer sheets.
2. In addition to this paper you should have available Actuarial Tables and an electronic calculator.
3. 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 3 hours to complete the paper.
4. You must not start writing your answers until instructed to do so by the Supervisor.
5. Attempt BOTH the questions.

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 IAI"

Candidates are advised that a reasonable standard of handwriting legibility is expected by the examiners and that candidates may be penalized if undue effort is required by the examiners to interpret scripts.

AT THE END OF THE EXAMINATION

Please return your answer scripts and this question paper to the supervisor separately.

- Q.1)** You work as an actuary in the Strategy and Research Department of a large and diversified multinational insurance company. You have received the following email from your boss, the head of the department.

To: John

cc:

From: George

Date: 1 May 2008

Our department has concluded research to evaluate opportunities to launch business in an emerging country XYZ. The desktop research was conducted by one of our junior research analysts, with three months of financial services experience. Her findings are contained in the attached memo.

To present these findings to the senior management I would like you to draft a presentation covering the findings.

The key messages that I'd like to highlight in the presentation are:

- Brief overview of economic trends
- Growth and size of insurance industry, split by life and general insurance, including penetration levels.
- The contribution and profitability of the various products
- Insurance regulatory environment, including any tax incentives for insurance.

Keep the presentation short, to around 10 slides.

Memo on New Market Opportunities in XYZ

XYZ is a nascent and emerging insurance market. The last few years have witnessed several important developments. These include the de-tariffication of some general insurance lines of business including fire and product & liability business. Motor and home insurance are still under tariff. The government has tried in vain to de-tariff the motor insurance business but has been unable to do so under pressure from the various lobbies.

The life insurance industry has restrictions on the interest rate used in the calculation of premium rates that cannot exceed a limit set every year by the regulator. The country has recently introduced the appointed actuary system for life insurers, which has now been in force for two years.

The premiums paid to purchase insurance (only life insurance) are deducted from the individual's taxable income subject to a maximum annual amount which is set equal to the minimum annual wage, set by the Labour Ministry. The current formula used by the Labour Ministry, which was adopted in 1999, sets the minimum annual wage to 25% of the previous year's GDP per capita.

Gains in life insurance products, either on surrendering the policy or at its maturity, are taxed at a flat rate of 20%.

Mutual funds are sold in the country, investing in a diverse range of asset classes, but the insurance industry has not yet seen unit-linked products which are prohibited. Several insurers are lobbying with the regulator to allow for the introduction of unit-linked products and the industry is expecting that their demands will be met by 2010.

The National Statistical Authority publishes two sets of inflation figures on a regular basis, the retail price inflation (RPI) and the consumer price inflation (CPI). The country's central bank has a formal inflation target based on the consumer price index as part of its monetary policy. The inflation target is defined as "...close to, but not above 4%".

All the relevant data on the industry is presented in various tables below. The data has been sourced from the National Statistical Authority for economic data and the Insurance Regulator for insurance data.

Table 1: Statistics

	2002	2003	2004	2005	2006	2007
GDP (in Rs billion)	150	153	163	177	189	202
Population (Million)	75.012	76.13	77.4891	78.6800	79.4500	80.4300
Men per 1000 Women	1050	1061	1068	1075	1080	Not available
Inflation (RPI)	4.71%	8.633%	5.10%	4.70%	4.30%	5.24%
Inflation (CPI)	5.10%	9.250%	4.95%	4.51%	4.23%	5.10%
Life expectancy (years)	65.0	63.1	64.5	65.21	66.089	Not available
Total Insurance Premium (Rs million)	750	1071	1793	2655	3024	4040

Table 2: Life insurance turnover

In Rs million	2002	2003	2004	2005	2006	2007
Endowment	253.13	350.00	566.05	807.65	883.92	1,131.20
Term Assurance	168.75	252.33	441.80	683.40	812.25	1,131.20
Whole of Life	140.63	211.63	372.76	579.85	692.80	969.60
Total Life insurance premium	562.5	813.96	1380.61	2070.9	2388.96	3232

Table 3: General insurance turnover

In Rs million	2002	2003	2004	2005	2006	2007
Motor	75.00	102.82	164.96	233.64	254.02	323.20
Home	18.75	28.27	49.49	75.93	88.91	121.20
Fire	65.63	84.82	127.84	169.39	171.46	202.00
Product & Liability	28.13	41.13	70.11	105.14	120.66	161.60
Total General insurance premium	187.5	257.04	412.39	584.1	635.04	808

Table 4: Profitability of life insurance products

Return on Equity	2002	2003	2004	2005	2006	2007
Endowment	12.0%	13.5%	13.0%	12.0%	12.5%	13.0%
Term Assurance	30.0%	28.0%	31.5%	24.0%	26.8%	27.5%
Whole of Life	7.5%	9.5%	8.6%	8.1%	7.4%	6.8%

Table 5: Profitability of general insurance products

Loss Ratio	2002	2003	2004	2005	2006	2007
Motor	110%	150%	145%	120%	130%	125%
Home	85%	90%	87%	86%	83%	86%
Fire	77%	75%	81%	83%	85%	89%
Product & Liability	60%	55%	62%	66%	70%	67%

Draft a presentation in accordance with the instructions received in the email. You can assume that the information contained in the memo is accurate and complete and that no further information is required. [60]

Q.2) Your friend has read the following note from a friend who works in the actuarial department of a life insurer and is unable to understand the concepts explained

“ Market value of insurance liabilities”

Computing the market value of insurance liabilities is a particularly complex issue as there are no deep and liquid markets for these and as such prices are not easily observable.

Insurers therefore build complex models to compute the market value of liabilities with key inputs to the model being assumptions regarding the volatilities of various assets, mortality levels, expense levels and surrender rates. Wherever possible market data is taken with for example volatilities being inferred from prices of derivative instruments.

As there are often no straightforward analytical solutions to these issues particularly for contracts with significant optionality and guarantees stochastic modelling involving the running of thousands of scenarios is a common approach to computing the market value of liabilities.

The approach often involves the generation of various so-called “market-consistent” economic scenario sets. The models also capture interactions between the various variables with for example surrender rates often being linked to the prevailing economic conditions. This is particularly important for policies offering guarantees. If the guarantee becomes valuable due to the prevailing economic conditions then policyholders may choose not to lapse their policies thus increasing the liability to the insurer.

The average of the value of the liabilities emerging from the market-consistent scenarios forms the best estimate liability. However, this is not generally the same as the market value of liabilities as the acquirer of the liabilities will want to be compensated for the cost of capital he will need to hold on his books. This need to hold capital arises from the fact that there are risks which cannot be perfectly hedged and therefore the buyer of the liability needs to hold capital to support these risks.

The sum of the cost of capital and the best estimate liability forms the market value of the liabilities.

It is important to choose the various assumptions carefully as often market values of options and guarantees are sensitive to the adverse tail of the distribution. As recent global events have shown events can often occur with a greater severity and frequency than assumed in the model.

Redraft the note in about 500-600 words to make it suitable for sending it to your friend who is not conversant with financial matters. You can assume that the information contained in the note is correct and that no further information is required.

[40]
