

Institute of Actuaries of India

Subject ST7 – General Insurance: Reserving & Capital Modelling

May 2012 Examinations

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.

Solution 1 :

- a) Unearned premium reserve may be defined as that part of the premium for which the risk has not expired.
- b)
- i) Annual Insurance cover with uniform risk spread, earned premium may be calculated on prorata basis using $1/365^{\text{th}}$ method. The underlying assumption, as mentioned, is uniform risk spread.
- ii) Marine Policies – specific cargo policies: are voyage policies and do not have an insurance period. However, on empirical basis, an estimate can be obtained for the likely period for which an insurance company remains on risk for policies involving different kinds of modes of transport. Premium can be earned on prorata basis over the period /duration of transportation for that specific transportation mode.
- iii) Marine Policies – Open policies and open covers: The entire premium is received in advance and underwritten. The transits covered under the terms of the policy are declared later through periodical declarations. Hence premium would be earned based on amount of transit declared, which in turn would be earned on prorata basis as in part (ii) above.

iv) Erection All Risk :

- (1) The risk exposure is not uniform and builds gradually during the policy period.
- (2) The value of risk builds up till the erection is completed followed by 2-3 months of commissioning and testing, during which risk exposure is maximum and remains constant.
- (3) Policy period is not always annual. It may be less than or greater than one year
- (4) Such policies may have other features (arrival of high value equipment very early in the project duration, phased handover, ALOP etc) other than longer duration and increasing exposure.

Given the above unique characteristics, it is very difficult to arrive at a standard formula for estimating earned premium. Any method that is reasonable approximation of exposure evolution during the project should be taken.

[5]

Solution 2 :

- Accumulations might occur from the same geographic region or due to large number of weddings in the same week or period. Large number of cancellations might happen due to bad weather.
- Claims frequency will be low but the severity could be high as it covers the elite class of the society. In most of the cases the claims will be of very high severity but it will depend on when the cancellation happens.
- Claims will be reported very quickly.
- Payment could take longer if the reason for cancellations is disputed.
- Potential for claim dispute regarding the definition of cancellations
- Relatively this will be short tail class of business
- Potential for moral hazard if MARRY starts getting business with high risk of cancellations for example weddings in rainy season etc.

[3]**Solution 3 :**

- Information could be entered onto the wrong claim record. The claim and policy numbers should both be in series that mistakes are difficult to make — a single digit wrong or two numbers swapped will give an invalid number, and it should not be possible for a policy number also to be a claim number.
- Incorrect amounts may be entered or correct amounts in the wrong currency. There should be some check on amounts. Very large or small claims should be queried if entered.
- This is especially important if working in a variety of currencies. A query should be raised if an amount is entered in a different currency from previous entries. A query should be raised if the claim is not in the currency of the country of the address of the policyholder (this will not apply for marine insurance, travel insurance and some other classes).
- A claim may be entered for an incorrect date. The system should automatically check that the policy was on-risk on the day when the claim occurred. A query should be raised if there is a very long gap between the date of loss (or reporting to the insured) and reporting to the insurer, or if the date of loss was later than the date reported.
- Information may be entered against the wrong policy.
- Other details, such as policyholder surname, deductible, and the fact that paid +estimated outstanding < sum insured, should be checked against the information on the policy record.
- Information may be missed out.
- A claim should not be accepted until all fields have been filled in, possibly with null entries.

[5]

Solution 4 :

Claims Reserves

1. Review the company's reserving methodology and draw comparison with MOTO. Are GIANT's methods appropriate?
2. As the company has global presence reserving process of the company needs to be reviewed such as process of booking reserves, frequency of internal and external peer reviews.
3. Review strength of reserving basis. Are assumptions too optimistic or too conservative?
4. Analyse the historical development of claims and adequacy of PY reserves.
5. This may require recalculation of reserves using MOTO's reserving guidelines
6. Additional analyses may be required for numbers and average claim cost separately to identify any trends which may be missed with standard reserving techniques.\
7. Investigate large claims experience for key portfolios
8. Investigate claims handling procedures. Claims adjusters setting case estimates may be too optimistic
9. Compare company claims development with external/industry benchmarks
10. Check for accumulations of risk in the book
11. Investigate and benchmark the rate- and inflation-adjusted historic loss ratios to identify trends and profitability compared to market
12. Cost per unit exposure analysis
13. Claims settlement pattern. This can highlight the any cashflow risk as MOTO is a company with large cash reserves [investment strategy and risk appetite] [1/2]
14. Need to investigate reserving trends in conjunction with the claims related trends e.g. UPR, (A)URR, OSCR, IBNR compare with previous years. Are there any noticeable trends?
15. Also, investigate trends in claims handling costs and associated reserve.

Capital & Financial

16. Solvency levels and free reserves. Statutory solvency requirements / levels of coverage
17. Impact on the MOTO solvency levels after the takeover.
18. Investigate the benefit of diversification by location, different products it will bring as this is the key objective of the takeover. What is the benefit of this diversification in terms of capital required? [1/2]
19. Funding of the takeover/Alternative use of funds.
20. GIANT's risk management strategy and appetite
21. Capital it holds in excess of the solvency capital required and whether it is adequate in terms of the risk profile of GIANT [1/2]
22. portfolio movements and investment strategy
23. premium rates charged if obtainable / industry premium levels
24. The asset mix and any associated changes.
25. Details on the credit ratings of say top 30 Debtors

Other

26. market share of GIANT globally
27. Credit rating/goodwill of GIANT and new business levels / premium volume/growth prospects
28. Restrictions on purchase anti-competitive laws.
29. Investigate the synergies that the combined operation will have and cost efficiencies it will bring.

30. Review the audit reports that are available for 3-5 years to check if there are any instances of frauds/reserving inadequacy.
31. Other accounting ratio investigations important
32. Loss/Claims ratio, Expense/Combined ratio, Commission rates, Investment
33. returns, Profit margin, Return on capital employed, Share price / p.e. ratio
34. reinsurance purchased, recoveries made, reinsurers security
35. taxation policy and compliance and regulation
36. policy conditions

[10]

Solution 5 :

- a) This gives rise to two particular problems for an insurance company wishing to place significant amounts of its funds in equity shares.
 - i) Current valuation regulations, in most of the countries, requires insurers to value their assets at market value, will mean that the company must reflect the fall in value in its statutory return, thus affecting solvency of the company.
 - ii) In an extreme case, this could lead to the company to become technically insolvent, even if it were satisfied that the income producing potential of the assets was undiminished, and the expected income remained enough to fund the liabilities.
 - iii) This might be countered to some extent by discounting liabilities to reflect the higher yield implicit in the assets' lower price. However, the ability to do this is constrained by regulations. Additionally, to introduce discounting at a time of market stringency might be seen as a sign of weakness by regulators, brokers and customers.
 - iv) Also, since the term of liabilities tends to be shorter than the term of equity shares, the solution could only be partial in any case.
 - v) Inability to liquidate the asset without adversely affecting the price would create difficulties in rebalancing the portfolio in favor of more liquid and stable asset class such as Govt securities.

b) Primary Objective

The objective of an insurance company's asset selection strategy should be to maximize investment return, subject to the overriding requirement to meet its obligations to policyholders and being able to maintain the required minimum level of solvency

Investment Principle

The usual investment principle that an insurance company should adopt is to match them to their liabilities by term, nature and currency.

Additionally the asset classes should be diversified or uncorrelated to the primary business to the extent possible

Term

In general, equity shares, which have no redemption date, are not well matched to insurance liabilities as far as term matching is concerned. Equity as an asset class have no redemption date. Insurance liabilities generally have a mean term of only few years, even on long-tail classes, with reducing amounts being expected to be paid in successive future periods.

Nature

Matching by nature means, comparing whether assets and liabilities are defined in nominal terms, or are affected by inflation. Short tail claims may be affected by inflation, but with only a short period to payment, the level of uncertainty involved is unlikely to be significant, and will not justify investment in equities.

Long tail classes are usually liability and /or casualty insurance, and are greatly affected by inflation. In addition, they are often affected by what is sometimes know as “judicial” inflation, which is very hard to predict.

Since the dividends on equity shares are paid out of profit, which is derived from doing business in current money, they may be expected to rise with inflation, and to form a reasonable hedge against inflation.

However the hedge is not perfect – few companies will have profits that are linked to judicial inflation – but it is better than most other form of asset class.

On the other hand, an unexpected burst of inflation will probably give rise to increase in interest rates, which may lead to rise in the yield from equities, giving rise to fall in prices. This would exacerbate the problems of valuation at current market values, and of liquidity in the case of sudden need for cash.

Currency

An equity share will be denominated, and its dividends paid, in a particular currency, but the underlying exposure will be to the currencies in which the company issuing the share does its business. A multinational company’s shares represent an investment in a number of currencies, which may or may not be good match with the insurance company’s liabilities.

Correlation/ Diversification

There is also a danger of correlation between a company’s insurance risks and its investments. For example, a major earthquake in a large city might cause a large fall in local stockmarkets and a significant fall in worldwide ones, just at a time when assets needed to be sold to pay claims.

Views on Equity Investments

In summary, equity shares may give a better return than most of a company's other asset choices, but a large holding may be a poor match for its liabilities and endanger its solvency and ability to meet liabilities.

A large solvency margin does give the company a cushion for this problem and allow it to make some investment in equities. Primary from shareholders fund

However, shares are unlikely to form a large proportion of a general insurer's investment portfolio.

[17]

Solution 6 :

(i)

(a)

- Regulatory capital - The amount of capital an insurer is required to hold for regulatory purposes is known as *regulatory capital*.
- Most insurance regulators require the insurer to hold sufficient solvency capital to provide a more or less explicit degree of comfort that the insurer can meet its liabilities to policyholders as and when they fall due. In other words, a fundamental purpose of solvency capital is to protect policyholders' interests. This is using the terms regulatory capital and solvency capital interchangeably.
- Economic Capital - The amount of capital that a provider determines is appropriate to hold given its assets, its liabilities, and its business objectives – this is known as *economic capital*
- and will be higher than the minimum regulatory capital generally.

(b)

Free capital or surplus capital means capital available over and above the required regulatory or solvency capital.

- This will be driven by the type of capital available. Total capital that is available may differ on regulatory and economic basis.
- For example – certain type of assets such as derivatives may not be allowed in the calculation of capital available for regulatory purposes but it may be included in the economic capital calculation.
- Discounting of liabilities may not be allowed for calculating total liabilities on regulatory basis
- Generally, amount of free capital will be more in the case of regulatory basis compared to economic basis in case of general insurance companies.
-

ii)

Credit risk refers to the risk of loss if another party fails to perform its obligations or fails to perform them in a timely fashion. For general insurance companies key counterparties include reinsurers, brokers, policyholders, investment managers and companies.

Reinsurance credit risk is usually the largest component of credit risk and deals with the potential bad debt on reinsurance assets.

When modelling the credit risk actuary need to keep in mind following factors:

Identify all the counterparties – Reinsurer, Investment Managers, Policyholders/Brokers and others such as S&S companies

1. Exposure to these counterparties need to be considered. Example : Premium income is often used to pay current liabilities so that a more long-term investment strategy can be followed. High and poor premium debt could reduce the premium income. A reduction in premium income can therefore lead to a lack of liquid assets with which to meet current liabilities. This is a type of underwriting risk.
2. Need to estimate the default probabilities for frequency of default and severity of default
3. Default curve probabilities could vary for each type of counterparties
4. These can be easily available from the market or credit rating agencies such as S&P, Moody's etc
5. Difficulty is with non-rated counterparties.
6. Actuarial judgment is required to estimate the default probabilities could be deterministic and vary by age of debt or could be fixed
7. Need to consider the concentration of debt by counterparty
8. Need to consider age of debt
9. Historical bad debt to provision ratio
10. Correlation and systematic nature of the counterparties need to be considered. Example : High and long due reinsurance debtors can also lead to high claims risk because generally the claims are paid by the primary insurer before they receive the recoveries from the reinsurer. This could even lead to a bigger problem in case if recoveries are related to catastrophic claims because reinsurer might be having large inflow of claims
11. Need to consider what happens in the extreme scenario or at the tail
12. These risks can be modelled deterministically or stochastically. When modelling stochastically need to define the distribution around the counterparty exposure.
13. Stress scenarios could be tested by modelling default by multiple counterparty
14. state-dependent migration matrices (which give the transitional probability of moving from one rating grade to another over a given year)
15. any collateral held by the insurer, *eg* letters of credit
16. non-recoveries due to reinsurance / broker disputes, and the extent to which this is considered within operational risk

iii)

1. More free capital will certainly reduce the chances of default by the company as company has more cushion against the adverse scenarios.
2. It reduce the risk that the available capital falls below the regulatory requirement, which would hamper the firm's business activities
3. For example, an insurer who held only marginally more capital than the regulatory minimum would be exposed to the risk that a fall in asset values would result in it being declared insolvent.
4. to give a greater degree of security to policyholders than implied by the relatively weak regulatory minimum as 0.5% of the probability of ruin may not be the strong measure in case of volatile markets
5. However, more capital may not give require confidence if the insurance company's risk management and governance is weak. Company with less free capital but better risk management may provide more security to policyholders because for example in case of big earthquake in lets say HOK might cause a company a loss in excess of USD\$1bn but

if the company did not purchase reinsurance to manage its risk it might wipe out entire capital of the company. This is because insurance company's liabilities or exposure to risk is multiple times of the capital.

6. Free capital will allow a buffer between the actual profitability of the business and the dividend stream paid to shareholders, who prefer less volatile returns.
7. It can improve credit rating of the company as company need to meet the requirements of other stakeholders such as debt providers, whose interests may be subordinated to those of the policyholders In other words; the solvency capital is intended to protect the interests of policyholders. However, the company may well be required to meet its liabilities to other parties; holding more than the minimum amount will help ensure these liabilities can also be met.
This will reduce the cost of capital or borrowing and may improve the profitability in long term.
8. Capital has a cost, ie the providers of the capital will require a return on their capital. All else being equal, holding a larger amount of capital means that a given level of profit is spread more widely amongst the providers of capital. This will lead lower return on capital and availability of capital may go down. Therefore excess of free capital may not be in the best interest of the shareholders.
9. There is a clear relationship between the amount of risk the insurer wishes to accept, the amount of capital it has and will require for that level of risk and the return it can make on that capital.
10. An insurer will need to assess how much capital it requires to take on a specific set of risks. If this capital exceeds the amount of available capital, then the set of risks it wants to take accept will need to be changed. The insurer will also need to consider what return can be made on each risk, bearing in mind the amount of capital that each risk will use up. There may be alternative risks that can provide a greater return on the capital. These risks will be preferred. Just holding high amount of capital without proper risk management will both not in the favour of policyholders or shareholders.
11. Also, need to consider is it free capital on economic basis or regulatory basis.
12. This will determine the quality of the assets and type of capital
13. On regulatory basis these defined generally is tend to be secure assets but on economic basis you might include derivatives highly toxic investment instruments
14. Need to think the modelling basis of assets and liabilities
15. Assets are modelled on mark to market basis or on the purchase value
16. Liabilities are discounted or not
17. Has the company considered extreme scenarios by stress testing and have loaded for these before calculating capital
18. All the risks have been evaluated such as group risk, operational risk apart from insurance, market, credit and liquidity
19. Investment strategy of the overall investments and particularly the free capital. If lets free capital based on regulatory is invested in property it may not be available when required so large free capital may be of no use.
20. Mix of business has been considered or not? This should be reflected in capital assessment .

[20]

Solution 7 :

The underwriting result (or underwriting profit) is the term given to the excess of premiums over claims and expenses. It is a crude measure of trading profit.

Insurance profit is the underwriting profit plus the investment income earned on the technical reserves. The insurance profit represents the profit achieved through writing insurance business.

Reinsurance is a form of insurance. It is a means by which an insurance company obtains from other insurance companies (reinsurers) protection against the risk of losses.

1. Limitation of exposure to risk or spreading of risk – important as the company is thinking of going globally. Less strain on company's capital resources. Accumulation of risk is there as company 75% of business is property.
 2. Avoidance of large single losses. Could be possible reason for the volatile results as company writes 75% of property business. Both commercial and personal. Frequent and large number of large losses.
 3. Catastrophic events leads accumulation of small losses that could be avoided or exposure could be limited
 4. Smoothing of results – through limiting the exposure. Upper limit of the losses can be capped.
 5. Increasing profitability only if the reinsurance is cheap. In long term reinsurance has cost.
 6. Company need to decide between high profits and stable profits
 7. Improving solvency margin as the capital requirement is high for more volatile business and less for stable business.
 8. Increasing capacity to accept risk. Release capital. Can bring diversification as company is predominantly in property which could be risky especially of there is a series of catastrophic events
 9. financial assistance can be available from reinsurance and brokers
 10. Availability of expertise. Important as company is thinking of going globally and may not have data to price risks or knowledge of the product or territory
 11. Reinsurance could be expensive because the company profits are very volatile and given the increased catastrophic events. Current reinsurance rates/insurance cycle.
 12. This could erode the profitability but in long term may mean stable uw results. This will help the company to get the listings on the stock exchange.
- i) **Facultative** -What is facultative? Suitable for Single large risks for commercial property business.
Treaty - What is Treaty? Suitable For personal lines property business as risks are more homogenous.
- Proportional**
 Q/S - Explain what is QS?

Q/S is useful to limit the total exposure and diversify in more areas or risks. This can be purchased for both commercial and personal depending on the terms and rates

Surplus – What is surplus Surplus is useful for commercial property business as the risks are not homogenous and company may want to retain less risk business and cede more risky.

Non-Proportional

XOL- What is XOL. Limit large losses. Smoothing of results. Important for commercial property as one single loss could erode entire years profits.

CAT XOL would be useful to cap losses in case of large cat event. What is cat XOL. How limits are different

Most important as it seems that profitability is under strain due to large number of cat events.

Proportional with non-proportional – What is it? It can help to reduce the reinsurance cost or cost of the cover

Stop Loss – What is it? Can limit the overall losses but very expensive and may not be available. Not very appropriate for property business.

[12]

Solution 8 :

1. Reasons

- a.** The reasons for the highest loss ratio could be the following
 - i.** Mix of business
 - ii.** Reserving of claims – more prudent than that of the industry.
Allowance for future inflation
 - iii.** Discounted / undiscounted reserves
 - iv.** Frauds
 - v.** Inclusion of claims handling expenses ; other companies in the pool may not be doing that
 - vi.** Claims management – more proactive reporting and settlement of claims
 - vii.** Mix of claim type e.g death and bodily injury
 - viii.** The book of the company is 5% of the size of the pool, and hence the experience may be influenced by large claims
 - ix.** Loss ratios by portfolio segments e.g geographical spread, vehicle age, etc. But loss ratios for the latest accident years will not be fully developed hence may not give a correct picture. Hence we may have to do reserving based on different mix segments to project the ultimate claims costs. In this analysis we may be constrained by availability of data for each sub segment.
 - x.** We can check average claims outstanding for different mix, nature of loss for the company as well as for the industry. We also need to check the paid amounts to ascertain if we are settling claims at more than industry average

- xi.** We need to work out both discounted and undiscounted values of the reserves and then compare with the industry. It would be worthwhile to check the pool reserving guidelines (if that exists) and regulations of the country to ascertain if reserves have to be held on discounted / undiscounted basis.
 - xii.** Fraud – check on internal processes and settlements to ensure that there is no leakage due to frauds . here also analysis of average claims paid by nature of loss benchmarked against the industry average would help. We could also look at close proximity claims and analyse whether we are being selected against. Channel wise analysis of loss ratios would also help to identify if any particular channel is contributing to any of the above
 - xiii.** We can analyse the claims handling expense that is being loaded into the claims reserves, which again may not be the practise of the other companies and may / may not be recommended by the pool . Normal range could be approx 5 – 8% , any loading above that, made by the company could call for a detailed claims handling expense analysis.
 - xiv.** The paid to ultimate ratio for the company as well as for the industry could be compared to determine if the company is paying claims faster than the industry.
- b.** The range of estimates essentially highlight the fact that IBNR reserve projections are based on different methods and may give rise to different estimate of ultimate claims cost. Hence the reserving actuary has to use judgment to determine the appropriate level of reserve based on the inherent uncertainties of the class of business for which the reserving is done.

From the given table we see that the paid estimate is lower than the incurred estimate. Also each method gives rise to a different estimate of ultimate losses. It becomes important to explain why the methods give rise to this range of estimates and how the management has to interpret outcome of the reserving exercise.

The points to be mentioned / captured in the note would include the following :

- i.** Payments are made after claims are incurred, so for early development periods (that is, those that are less developed) the paid claims data can be very sparse and hence unreliable for projection, leading to potentially different paid and incurred projections.
- ii.** Large complex claims usually take longer to settle and there may still be significant case reserves at later development periods.
- iii.** One pattern may be more volatile than the other, which makes projections difficult.
- iv.** At later development periods there may be only a small number of open claims remaining, with the remaining claims all settled. In such

cases it may appear, by looking at the paid claims development, that there will be no future development and hence a paid link ratio model is likely to give different answer to an incurred link ratio model.

- v. Changes to case reserving procedures over time.
- vi. However, depending on the case reserving philosophy and on the level of reserves established, it is possible that the development may initially increase to a value greater than the ultimate level and then decline over time; for example, if conservative case reserves are set up at the outset or if subrogation recoveries are made.
- vii. Chain ladder may be more appropriate to alternative approaches, such as the ACPC method (where claim number development may run-off quicker than claim amount development), or the Bornhuetter-Ferguson method which incorporates an expectation of the ultimate loss.
- viii. The ACPC method may be influenced by the accuracy of the number of claims being maintained in the claims registers. There could be multiple claims in a third party motor accident and if the company is booking claims arising out of a single accident in one claim, there could be distortions in the average claim amounts projections.
- ix. The Bornhuetter-Ferguson method is very useful where the available data for the particular cohort is sparse. This is often the case with more recent cohorts, cohorts from longer-tailed portfolios (for example, liability excess of loss reinsurance) or where premium volumes are so small that claims activity is expected to be extremely volatile.
- x. The above consideration is particularly true for the motor third party liability book for which the reserving exercise is being done. Since the company has only 5% market share, it would be a more stable projection of reserves, if the credibility based BF method is used.
- xi. However, the BF method is dependent on the initial loss ratio being used in the estimate. The accuracy of that would influence the final outcome from using these methods.
- xii. From the given table, of the range of estimates of ULR we see that the initial expected loss ratio is 251%, which is higher than any of the estimate arrived at by using other methods. We need to disclose why we believe that initial expected loss ratio to be the correct estimate could be driven by inflation, mix of the business underwritten, feedback from Underwriting
- xiii. Best estimate is generally defined as the actuary's estimate of mean or expected value of outcome. However, it is not always easy to arrive at an estimate of a central value. In this possible case, the actuary, may or may not include all the estimates to arrive at the best estimate value of the ULR.
- xiv. One option could be to exclude the highest and the lowest ULR and arrive at an estimate based on the other methods. Whatever the approach, there has to be proper disclosures to the effect.

- xv.** Given the inherent uncertainty about long tail liability business, we should effectively communicate the need for maintaining a reserve margin. The risk margin or range gives an estimate of the uncertainty surrounding the best estimate. The margin may be defined at a suitable level (may be as a percentage of outstanding and IBNR claims).
- xvi.** In most reserving situations, it is appropriate to monitor the emerging experience against the expected outcome. This will require us to select a reserving method where we can derive the expected outcome (eg over the next year). In these cases, methods which separately model the IBNER and pure IBNR components of the reserves may have advantages over methods that model these components in the aggregate.
- xvii.** Before finalisation of the estimate we should also apply diagnostic tests to check that results are reasonable

Communication of uncertainty :

- i.** While preparing the report , we need to adhere to professional guidelines. In this case, we may have to disclose the uncertainties with respect to the estimates by showing various scenarios.
- ii.** The terms used to identify the sources of uncertainty include:
 - a. parameter uncertainty
 - b. process uncertainty
 - c. model error
 - d. systemic error.
- iii.** The objectives in communicating uncertainty should include the following:
 - a. ensuring stakeholders understand the level of uncertainty
 - b. being consistent with the vocabulary used by other actuaries and other
 - c. professionals and explaining any terms that may not be understood by
 - d. the audience to which the report is directed
 - e. emphasising the bigger issues
 - f. explaining what has been allowed for in the best estimate, and what has
 - g. not
 - h. emphasising the unusual issues
 - i. commenting in the context of the scope and purpose
 - j. avoiding misunderstandings.
- iv.** It is usually advisable to accompany the communication of the reserving basis with a clear explanation of which elements of the

reserves are included; for example, if they include allocated and/or unallocated loss adjustment expenses, if they are net or gross of reinsurance and/or net or gross of salvage / subrogation and/or net or gross of reinsurance bad debt etc.

- v. For major assumptions, stress tests to highlight the impact of any deviations from assumptions on reserve estimates should be included to highlight to the users of the report, the materiality of each assumption.

(i) Adverse development cover

Adverse development cover is a reinsurance arrangement whereby a reinsurer agrees, in return for a premium, to cover the ultimate settled amount of a specified block of business above a certain pre-agreed amount.

Claims are usually still handled by the insurer.

Reserves are maintained by the insurer and it receives all investment income generated from the investments backing these reserves.

(ii) Risks transferred

The main risk transferred is the reserve development risk, *ie* the reserves being inadequate to cover liabilities.

It caps the liabilities ...

... and protects the balance sheet from future losses in respect of old business.

(iii) Risks retained and additional risks accepted

Risks retained

The insurer may not be able to transfer the entire risk of the reserves being inadequate.

In particular:

it is usually only possible to reinsure a layer above a specified amount – this specified amount may be in excess of the current level of reserves there could be an upper limit to the cover provided by the reinsurer – if the ultimate cost of losses is in excess of this, the insurer is liable for the excess the reinsurer may also insist that the insurer retains a small participation in the layer.

Since claims are likely to be handled by the insurer, the insurer is at risk that claims handling expenses are higher than expected.

Furthermore, since the insurer will maintain the reserves, it will be at risk that investment income on the reserves is lower than expected.

Additional risks accepted

The additional risks accepted include: the credit risk of the reinsurer, since legally the insurer remains liable to the insured parties for all claims that the premium paid for the adverse development cover is relatively high considering the risks taken on (this depends on the risk appetite of the market).

Legal expenses risk in case of dispute with reinsurer

(iv) *Overcoming the additional risks*

The insurer should assess the credit risk of the reinsurer by looking at its credit rating and past history of writing adverse development covers.

The insurer could request that the reinsurer deposits some reserves with the insurer, which will be repaid if experience turns out to be better than expected.

The insurer could consider an alternative that would transfer the legal liability to the reinsurer, *eg* a loss portfolio transfer (LPT).

The insurer could only take out an adverse development cover when market conditions are favourable (*ie* when premium rates are low).

In other (less favourable) conditions, the insurer could seek an alternative way of transferring the run-off risk, *eg* it could securitise the business, although this may also be expensive.

[28]

[Total Marks – 100]
