

Reserve Reports and Opinions Working Party

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# Outward Reinsurance

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# 1. Key Issues

Opinions expressed in this paper do not necessarily reflect the views of all members of the working party, or of any organisation with which they are or have been associated.

The working party has identified the following as the key issues that arise in the consideration of outwards reinsurance in the context of providing an actuarial opinion on the insurance technical reserves.

1. Bad debts - should actuaries make a decision on which reinsurers to make a provision for? There is a role to play in providing information on recoveries by layer and by probable timing of recovery.
2. Data - what is available and how has it been constructed?
3. Accounting framework - understanding this, especially in relation to the going concern or run-off basis.
4. Market practice and administration of reinsurance - an understanding and appreciation of this.
5. Policy wording and terminology - in particular the interaction of a programme structure.
6. Financial reinsurance.
7. Exhaustion and adequacy - which may require sensitivity tests, and will demand an appreciation of variability.
8. Consistency - in particular, how far can the past be expected to be a guide to the future.
9. Premiums - the fact that these are often loss- or exposure-sensitive.
10. Legal issues and disputes.
11. Diversity of contracts and programme structures - from the large direct composite to the small London Market specialist.
12. Volatility of loss experience - which therefore gives rise to limitations of statistical methods.

Further discussion of these and other issues that have been identified is laid out in the following sections of this paper, under the headings: "Accounting", "Information", "Interpretation", "Claims Handling", "Method" and "Classification". Reference is made in these later sections to an earlier (1993) GISG paper: "Reserving for Outwards Reinsurance".

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## 2. Accounting

1. It is essential for the actuary to understand how an insurer accounts for premiums and claims arising from outwards reinsurance. Unfortunately different insurers often adopt different conventions when accounting for outwards reinsurance. This section describes a number of the key issues which the actuary should consider.
2. Many excess of loss reinsurance policies specify the exchange rate (the 'slip rate') to be used in calculating the maximum recovery which can be made. This rate is almost always different, often significantly so, from the rate which is used to produce claims and premium data and accounts. Also, the slip rates may be different for different layers of the same programme or for different programmes (e.g. marine versus non-marine). The gross individual claims need to be recalculated at the slip rates before they can be applied to the reinsurance programme. For estimation purposes, the projected ultimate amounts for these individual claims may also need to be calculated at the slip rates if distortion is to be avoided, though the actuary may be satisfied that any distortion will not be material after having made investigations.
3. When estimating an insurer's outwards reinsurance recoveries, it is important to take into account any reinstatement premiums payable, together with possible recoveries from reinstatement premium protections. Credit should not be taken for any part of the reinsurance programme which has been commuted and the effect of inwards commutations on reinsurance recoveries will need to be considered carefully both at the time of the commutation and in subsequent reserving exercises.
4. Consideration will also need to be given to any commutations which have an option to reopen. It is important to understand how commutations and partial commutations have been reflected in the data and accounting information. There may also be an option to commute in some reinsurance contracts, and these need to be understood and taken into account.
5. So-called financial and finite risk reinsurances will often significantly distort net claim and premium data. It is normally necessary to remove the effect of financial reinsurances from the data before undertaking projections. Once the underlying claims have been projected the effect of these claims on the financial reinsurance will need to be considered. Recoveries from financial reinsurance policies which are consistent with the gross claim and premium projections can thus be calculated. The precise application of financial reinsurance may, however, depend on future business, both premium income and claims. Therefore the recognition that can be given to the contract at a given valuation date may not be straightforward.
6. What is regarded as financial reinsurance depends on the degree of risk transfer, in terms of amount and/or timing. There are differences in this regard between the UK and US accounting principles. The actuary may be required to perform tests as to whether a given contract has (or was expected to have at the time it was written) the required level of risk transfer.

7. Net of reinsurance data can be presented on a cash basis where credit is only taken for reinsurance recoveries which have been received or, more usually, on an accruals basis where the reinsurance recoveries credited are consistent with the inwards claims whether or not they have been collected. The treatment may also differ between paid and outstanding amounts. Data presented on a cash basis can easily be distorted by a large claim for which the associated reinsurance recovery has not yet been made.
8. Manual adjustments are not uncommon, but these are often not incorporated into the development triangles. In other words, while manual adjustments may be readily available as at the valuation date, the history of manual adjustments (which would help to smooth the triangles) may be less easy to obtain.
9. Reinsurance recoveries often arise from policies which provide cover for business written in more than one accounting period, class of business or entity. The allocation of these recoveries will affect the profitability and reserve requirements of each part of the business. The actuary may or may not be giving an opinion on all of these elements, so this allocation could be crucial. If an allocation has already been made, the actuary will need to check that the basis is appropriate. This will often be a matter of judgement but there may be agreements in place particularly where more than one entity shares the recoveries.
10. Sometimes a split of the reserve requirement is not required. In this case, it may be easier not to attempt any allocation of catastrophe recoveries by class or underwriting year. However, in some situations separate underwriting years may be separate legal entities (e.g. with Lloyd's) or may be subject to varying degrees of parental (or former parental) guarantees or indemnities.
11. The allocation of reinsurance recoveries (and premiums, especially reinstatement premiums) between different accounting periods can cause apparent distortions in the data. The net development of different underwriting years can be very misleading if the allocation of reinsurance recoveries is inappropriate. For example, allocating all of the catastrophe recoveries arising from one event to the accounting year which includes the date of loss could cause negative net claims development for this year and serious deterioration for other years affected by the catastrophe.
12. More subtle effects can be caused even when the allocation basis is apparently sensible. For example one possible basis would be to allocate catastrophe recoveries between accounting years and classes of business in proportion to the amount of inwards claims. If the insurer has exhausted its outwards protections and the catastrophe is developing only in one class of business, then the reinsurance recoveries will be reallocated between classes, causing apparent net deterioration in classes which are suffering no inwards claim development.

13. Triangular data and accounts can be significantly distorted by the allocation of losses to reinsurance policies. For example, aviation reinsurance has traditionally worked on a date of loss order, although a few insurers have recently attempted to get this changed. This is believed to be because they are marine insurers and reinsurers (see below) whose inwards business provided coverage on a different basis. It is believed that their attempt to change contract wordings retrospectively is not succeeding - as their reinsurers have in turn bought retrocession coverage on the basis of the date of loss order.
14. Where losses have to be considered in date of loss order, reinsurance recoveries would be reallocated if a loss which occurred early in the policy term developed, and became a claim to the reinsurance policy, at a later date than losses which had occurred after it. In contrast, losses which are recovered on a marine reinsurance are usually determined by the date of settlement. Thus no reordering of losses normally takes place. Date of loss order can cause apparent late net deteriorations in property accounts if joint reinsurances have been purchased for both the casualty and property accounts when some of the property losses are displaced by late reported casualty losses.
15. A reinsurer who writes policies subject to date of loss order will sometimes see the claims from some events dropping back when an earlier loss pushes a later loss out of the reinsurance policy, due to the impact of limited reinstatements. It is important to be aware of the implication at a net of reinsurance level of any reordering of inwards losses. Inconsistencies between inwards claims and recoveries can occur if inwards policies are subject to date of loss order but outwards policies are subject to date of settlement order. This situation is most frequently encountered when a marine reinsurer writes aviation reinsurances.
16. Premium data is usually held separately from claim data. However, particularly in the London market, premiums are sometimes accounted as negative claims after the third development year. It is also important to understand how reinstatement premiums, both inwards and outwards, have been reflected in the claim and premium data.
17. It is important for the actuary to ensure the distinction between premiums and claims is understood and maintained in any system specifications. The most important differences within premium information are those between minimum and deposit premiums, adjustment premiums (additional or return premiums) related to exposures and reinstatement premiums or swing premium adjustments related to losses. Some premium adjustments will attract brokerage while others will not (e.g. reinstatement premiums). The fact that commission may be adjusted depending on the loss experience, perhaps taking into account deficits from earlier contract periods should also be recognised.
18. As with many other areas of actuarial work, it is important to be aware of any changes in the data caused by changes in market practice or by changes in the insurer's own information systems or accounting practice. Historic changes in practice may mean that data is not available historically on the same basis on which it is presented today.

19. Accounting information is often presented after the recoveries from outwards treaties have been taken into account. In this case, it may be necessary to check that the treaty terms have been applied correctly. Whilst this is often difficult if there is a multitude of treaties, it is clearly important to ensure that there are no material errors in the data due to the incorrect calculation of the recoveries from a major treaty.
20. The fact that reinsurance contracts generally have only limited reinstatements means that the recording of losses, paid or outstanding, is not straightforward. For instance, suppose a reinsurer has written a layer with two reinstatements, giving a maximum of three total losses payable, but there are subsequently four losses that occur and that could affect the layer concerned. The cedant may advise the reinsurer of the full estimated amount (paid plus outstanding) of all four losses, say each being a total loss to the layer. The reinsurer has a choice whether to record the full amount of these advices, in which case the contract will be reserved for more than the total amount of the liabilities payable, or to reduce the amount recorded in some way. This may be done by recording an amount less than the full amount advised on each loss (e.g. in this case by recording each of the four losses at three-quarters of the limit of the layer) or by recording only the 'first' three losses (perhaps by taking them in date of loss order if this is applicable) or by recording an offsetting credit or negative reserve for the contract as a whole unrelated to any specific loss. Each method has implications for the way individual loss events then appear on the system and are compared with the outwards reinsurance programme. The reinsurers cedants also may be recording and advising any combination of the bases described above, or on a different basis entirely. This makes the situation extremely complicated.
21. Very often there is not an integrated computer system, but separate systems for inwards and outwards business. This gives rise to the potential for discrepancies.
22. Proportional reinsurance often has very different and unusual accounting treatment compared with non-proportional reinsurance. In these contracts, portfolio transfers are common, which transfer liabilities from one contract period to another. These are more the concern of the writer of proportional reinsurance than the cedant, but does affect the security of reinsurance recoveries. For the reinsurer, premium portfolios (i.e. the payment in respect of the unearned premium reserve) is usually regarded as a premium inwards. However, the claim portfolio transfer (i.e. the payment in respect of unpaid losses) is usually treated, not as an inwards premium but as a negative paid claim. This means that the paid loss statistics are distorted, often very significantly, and do not represent cash flows.
23. It is important to recognise that paid loss statistics do not represent cash flows, although they are reasonably close to actual cash, subject to timing delays and non-performance of reinsurance and the above point on claim portfolio transfers.

24. Facultative reinsurance can arise in a number of ways. In some cases it comes built in with the inwards contract that is being written, perhaps for the entire risk, in which case it amounts to fronting. In other cases it is sought by the cedant to reduce exposure to a large inwards risk. Some statistical systems automatically deduct facultative reinsurance figures from gross, so that it is not easy to obtain fully gross information. Working solely with figures net of facultative reinsurance does not give any idea of the exposure to potential failure of facultative reinsurers. These may or may not be vetted by the cedant's security committee to the same degree as treaty reinsurers.

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### 3. Information

1. Reinsurance policies are independent legal contracts and it is important that the way in which they react to losses is understood, to avoid misinterpretation.
2. Types of information which should be capable of being determined from a detailed study of the contract wording relate to:
  - the policy's position in relation to other reinsurance policies within the same programme
  - details of the way in which the contract does, or does not, respond to individual losses
  - details of the premiums payable
  - details of the timing of transactions under the contract
  - administrative arrangements regarding the rights and duties of the different parties to the contract.
3. Such details are necessary to clarify the position in what is an extremely complex market, and to provide a reasonable basis for the smooth running of the reinsurance industry.
4. Nonetheless, there are inevitably some matters arising, in certain circumstances, which are not covered unambiguously by the policy wordings. These may be determined by mutual agreement allowing for normal market practice, or they may result in the need for arbitration or litigation to resolve disputes between the parties. The actuary should be aware of some major aspects of market practice, and should be aware of the possibility of disputes arising, but any analysis of outwards reinsurance should be based primarily on a study of policy wordings (or at least the cover notes).
5. The outwards programme may consist of a large number of individual treaties, and it is important that the actuary understands the order in which they respond to a particular loss. In the case of a non-proportional reinsurance, much of this can be derived from comparison of the policy excesses under the various contracts, applying the policies in increasing order of the excesses. However, this is a gross oversimplification of many of the more complex programmes. Some of the other issues are outlined below.
6. It is quite common for a non-proportional programme to consist of a number of sub-programmes, each starting with a low excess. It is then necessary to know how these sub-programmes relate to each other in dealing with a particular loss. In general, a "class specific" programme will respond to a loss before a "whole-account" programme, but such generalities should not be assumed without confirmation.
7. It is necessary to know whether proportional reinsurances are taken into account before or after non-proportional arrangements. Both are possible, and introduce different issues. This is dealt with further in relation to "common account" protections.



8. There may well be "back-up" layers within a sub-programme with the same excess as the policy to which it provides additional reinstatements. The order in which they come into play should be indicated by the inclusion of an "aggregate deductible" or similar arrangement within the back-up policy.
9. There may be "variable" covers within a programme. These include such policy types as top and drops and cascades, and their common feature is that they do not have a fixed position in the programme. Within the contract wording, it is usual for the excess to be a low figure, although such contracts can almost always provide additional cover at the top of the programme. The extent to which it can be used at a lower level varies considerably and needs to be ascertained by detailed consideration of the contract wording.
10. Given these, and other, features affecting the order in which reinsurance policies are applied, it is often helpful to summarise a programme (or even a sub-programme) in graphical form. There are software packages available to assist in this process.
11. The 1993 GISG paper "Reserving for Outwards Reinsurance" deals with the peculiarities of variable covers, franchises and warranties. The major issue regarding variable covers is addressed in the previous section of this note. With regard to the special features of franchises and warranties, these relate to the need for a loss to satisfy additional criteria if it is to be recoverable under a franchise or warranty contract. In the case of a franchise, this normally relates to the size of the gross loss to the reinsured being at least a certain figure. In the case of a warranty, this relates to the size of the original market loss being above a "trigger" point. One impact which arises from the inclusion of such covers within a programme is an additional volatility, as a small movement in the gross quantum from one side to the other of the trigger can cause a major change in the recoverable amount and hence on the net figures.
12. It is common practice for proportional reinsurance to come into play before non-proportional treaties. In this situation, the proportional reinsurers receive no protection from the cedant's non-proportional reinsurance, and may need to purchase additional cover themselves for this purpose.
13. If, however, the proportional reinsurance is calculated after application of the non-proportional protection, then the proportional reinsurers would usually obtain some benefit from the non-proportional treaties. Such treaties are generally termed "for common account".
14. Common account protections of this sort have certain advantages and certain disadvantages compared with reinsurers having to purchase their own non-proportional cover. Clearly there are the advantages of expense savings and the fact that the cedant should be in a better position than the reinsurer to satisfy enquires regarding the nature of the account. On the other hand, if the reinsurer is also involved in the acceptance of similar business from other cedants, the use of common account reinsurance in respect of each of these will potentially leave a problem of multiple net retentions arising from the same event on a number of these involvements. This could be better covered by the reinsurer purchasing non-proportional reinsurance on the overall acceptances.

15. The LMX spiral is covered very briefly in the 1993 paper. The important features of relevance to the actuary are that losses being passed around the spiral are generally much longer-tailed in their development than other non-spiral losses. This results in a situation whereby the development pattern applying to a particular year is dependent on the extent to which major spiral losses are included. This makes the application of chain-ladder methods of projection inappropriate without removing the impact of the spiral losses.
16. The extent to which the spiral lengthens the tail also depends on the amount of "leakage" out of the spiral due to such features as reinsurance to other (non-spiral) markets, the level of any co-reinsurance, the level of retention, the extent of involvement of failed reinsurers and exhaustion of programmes. As these features vary over time, there is usually very little relevant historical data to assist in estimating the ultimate cost of spiral claims, at least in the early part of their development. Some form of exposure analysis is often used as an alternative means of assessing the situation, but this also requires assumptions which cannot easily be derived.
17. Financial and finite-risk reinsurance has grown in importance over recent years largely in response to the lack of full risk-bearing reinsurance cover in certain areas in the market. Such arrangements need careful consideration as they can significantly distort both development patterns and results.
18. In order to avoid distortion of the data, the effect of all financial and finite-risk reinsurances should be removed from the data before estimation of reserves. As the number of such contracts is generally fairly small, this is usually relatively straightforward, provided the issue is identified.
19. The adjustment necessary for the future impact of these contracts tends, however, to be more complex, due to the involved nature of the transactions arising under the contract. These often include commissions, premium adjustments, commutation options, and interest on funds. There may even be interconnected contracts which need to be considered in conjunction with one another, in order to appreciate the full effect.
20. In order to see the range of possible outcomes, it may be necessary to consider the effect of various scenarios, each of which is consistent with the projections carried out on the account gross of these arrangements.
21. One additional factor which can arise in the Lloyd's market is the use of spread-loss or similar arrangements which span more than one underwriting year of account (i.e. are effectively providing "protection" to a number of different capital providers). The problem here is the allocation of the future transactions to the different capital providers in an equitable manner bearing in mind the balance of past transactions.

22. In addition to the above factors, it is likely to be necessary to consider various future situations which may not be explicitly covered by the financial reinsurance contract wording. Such situations can include the possibility of the ceding company going into run-off or significant reduction in business written. Only a detailed consideration of the various possible interpretations of the wording in such circumstances can assist in interpreting the impact.
23. Many non-proportional reinsurances are subject to reinstatement of limits, either with or without additional premium. Such situations may give rise to two particular issues of a nature likely to concern an actuary reviewing the reserves or financial condition of the company.
24. The first of these is the adequacy of the number of reinstatements to protect the account against the number of losses anticipated, and the consequent need for additional reserves for horizontal reinsurance exhaustion.
25. The second is the need to project future premiums, which can be a fairly material issue in some cases. It is, however, also necessary to consider the receivable reinstatement premiums on any inwards reinsurance business, and sometimes these may be of a similar order of magnitude.
26. An alternative to reinstatement premiums, but one which can have a similar impact on the need to project future premium adjustments, is swing-rated reinsurance. This tends to be confined to working layers, and is rated as a deposit premium which is subsequently adjusted on a burning cost basis according to the claims experience under the contract. The total premium calculated in this way is defined by a maximum and a minimum, identified in the contract wording.
27. Reinsureds who may be required to pay reinstatement premiums under their outwards contracts may, depending on market conditions at the time, be able to purchase reinstatement premium protection (RPP) policies to indemnify them against this eventuality. Recoveries under such claims are generally booked as negative claims, and can severely distort the net claims progression, even to the extent of producing negative cumulative claims on occasion. To remove this distortion it is highly desirable to take the RPP's out of the data before projecting. The future RPP recoveries should then be used as an offset to the estimated future reinstatement premiums payable, to the extent that the policy limits allow.
28. It is important when considering the coverage afforded by a non-proportional reinsurance programme to include a complete review of all aspects where there are shortfalls causing losses to fall on the net account.
29. The obvious sources of such net cost are below the programme (net retention), above the programme (vertical exhaustion), behind the programme (horizontal exhaustion) and in front of the programme (aggregate deductibles on reinsured layers).

30. There is also, however, the possibility of shortfalls within the part of the programme which is basically reinsured. These can arise from layers not being purchased at all, or being only partly placed, or a variety of other causes to which reference is made in the next few Sections.
31. Some treaties, particularly those providing coverage against bodily injury claims, contain indexation provisions under which the limits and/or deductibles for the layers increase according to the time to settlement in line with a predetermined index. One feature of such arrangements is that the use of indexed layers in conjunction with unindexed layers, or in conjunction with layers subject to a different index, can result in gaps appearing between adjacent layers.
32. A similar feature can arise due to adjacent layers in a programme having different "slip rates of exchange" by which losses arising in different currencies are converted to the currency in which the layers are principally denominated.
33. A much more common reason for gaps arising in the programme is through the partial placement of layers. This may arise from a market agreement to retain a co-reinsurance line on each layer, a conscious decision to purchase less than 100% of the layer, or failure to find adequate capacity to purchase the full extent of the cover.
34. The market agreement is likely to be a feature to reduce the impact of the LMX spiral. The conscious decision could arise from cost/benefit considerations of the reinsured. The lack of adequate capacity will depend on market conditions.
35. There are occasions when major claims arise soon after the normal renewal date of the relevant reinsurance protection. In such circumstances it is not unknown for reinsurance coverage to be incomplete at the date of occurrence of the claim. In these circumstances a gap arises. One of the best known examples of this situation was the reinsurance of the master drilling rig contract which was not fully placed for all participants by the date of the Piper Alpha loss in 1988.
36. The contract wordings will determine what classes of business are covered by each layer. It is important that adjacent layers in a programme should cover the same classes to avoid gaps appearing in respect of certain categories of claim. It may, however, be perfectly satisfactory for higher layers to be wider in the scope of classes covered than lower layers which may be more specific, and covered by different sub-programmes.
37. In addition to the issue of the classes covered by the treaty, there may be more specific exclusions within the wording. This may relate to categories of claim within a class, or business arising from a particular source. These exclusions can affect the future net liabilities if such claims have significant gross IBNR potential.

38. Much reinsurance business is purchased on a "losses occurring during" basis, and this unlikely to be in line with the inwards business written in a year which, even if all policies are purchased for 12 months duration, is likely to produce exposure over a 2 year period. This is not a problem for an ongoing business, in that next year's reinsurance will cover the balance of the inwards business not protected by the current reinsurance programme. In the event of the business being terminated or severely reduced, however, there is likely to be the need for run-off reinsurance to be purchased. In this event, the reinsurers are likely to be in a very strong negotiating position at the time when the cedant may be least able to meet their premium demands or able to withstand the impact of a large loss.
39. Some non-proportional treaties contain aggregate extension clauses under which claims can be aggregated together before application of the limit and retention. This particularly applies to products liability policies under which the total of all claims arising from the assured's products during the period of the products liability policy can be aggregated as a single claim. This had particularly important effect in the case of asbestos related claims. In order to be able to claim under a retrocession policy using the aggregate extension clause, it is necessary for there to be aggregate clauses in the original insurance policy, and the reinsurance policy, as well as the retrocessional policy.
40. Another general problem which can exist in relation to aggregation of losses is the identification of losses which may be capable of aggregation for recovery purposes, i.e. losses arising from the same "event". In the case of occurrence-based underlying coverage, the date of loss can sometimes be used to help in the identification process. However, where the policies are written on a claims-made basis, this is unlikely to be helpful.
41. Under many reinsurance policies, it is required that the reinsured provides detailed information to the reinsurer regarding large losses notified to them and for which they may subsequently claim under the reinsurance. The level at which such reports are required under an excess of loss treaty is often 50% of the deductible.
42. As well as reporting requirements on large losses, it is normal for treaties to contain a provision under which large settlements recoverable under the treaty can be claimed at once, whereas the smaller losses will be included in the next quarterly account.
43. Many treaties (particularly proportional treaties) are subject to a profit commission clause, usually including a deficit clause. Future payments under such a clause may need to be considered as part of the estimation of future liabilities. It is quite often the case that profit commission adjustments are made for many years, as the claims under the treaty develop to final settlement.

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## 4. Interpretation

1. Reserving for losses under reinsurance treaties (particularly long-tail non-proportional treaties with aggregate deductibles) often requires the use of development patterns and expected loss ratios from an outside source. This is in order to be able to use such an approach as the Bornhuetter-Ferguson method, which may be the preferred approach given the lack of credible data arising from the treaty itself. Some allowance should, however, also be made for the business written. In addition, given the uncertainties in such projections it may be necessary to take a rather more cautious approach to reserving for such business, especially if it is significant to the financial condition of the company.
2. Reporting on reserves may be required for a number of different purposes, necessitating different methods and assumptions.
3. In particular, there is the need for greater caution in the approach to be used for such purposes as solvency appraisal than there is for determining the profitability of the business. Reserving for published accounting purposes will require an approach somewhere in between these extremes, whereas assessment for merger and acquisition purposes or commutation will be on a similarly realistic basis to an assessment of profitability.
4. In the case of a Lloyd's reinsurance to close, a risk margin should be included, but probably the most important feature required is consistency in the basis from year to year.
5. Reinsurance programme adequacy is a major factor in assessing net reserve requirements. Inadequacy in the amount of limits purchased for an individual loss is described as vertical exhaustion of the programme. Once a loss reaches a point near the top of the outwards reinsurance programme, there is likely to be a significant gearing effect on the net account in relation to any further deterioration in the total amount of the loss. Purchase of an inadequate number of reinstatements at a particular level of loss is known as horizontal exhaustion. Once the programme suffers from either vertical or horizontal exhaustion, continuing receipt of gross losses in the area where such exhaustion occurs is likely to result in a direct one-for-one impact of the net account.
6. As indicated previously, there are a number of different types of reinsurance arrangements, placed in different manners in different layers and programme/sub-programmes. For many purposes, it is appropriate to review the data net of facultative and other specific reinsurance (e.g. proportional arrangements which are taken into account before non-proportional programmes) and then to consider the other (mainly non-proportional) reinsurances as a separate element of the reserving exercise. The gross less specific level is often loosely referred to as "gross" in this context. It is important that the actuary is aware of the level of the data being used in this respect, and the consequent interpretation of the results.

7. This definition of "gross" is but one use of terminology which is imprecise. Within the reinsurance market, jargon is widely (but very inconsistently) used. The actuary should ensure that he/she is aware of the meaning of such jargon in each particular situation which is encountered, and should not assume that it is being used consistently from one company to another.

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## 5. Claims Handling

1. The basis on which case estimates are handled are recorded in particular for large claims will have an impact on outstanding recoveries both in respect of notified and IBNR funds.
2. Reserves may be set up covering a number of original losses (bulk reserves) where insufficient data is available to identify the individual losses and potentially recoveries that are available. The allowance made in recording outstanding losses for any index clause in both inwards and outwards treaties may give rise to large movements on settlement.
3. Practice in respect of recording precautionary reserves needs to be understood and if the data is accessible may give some insight as to where future notifications may result and the level of reinsurance or specific excess of loss. Asbestos related and pollution losses and Casualty Excess of Loss Treaties with reporting clauses are areas where there may be substantial precautionary advances. Cedants may also advise IBNR losses which may be separate or included within notified outstanding losses.
4. For claims made policies, reinsurance recoveries may depend on aggregation of losses from the same original loss and hence date of claim, i.e. clash covers. For excess layers the date of claim is not the same as the date of advice to these layers, but the original date of claim may not be readily available. Therefore possible recoveries may be missed or only recognised at a later date. The identification of related claims that can be 'clashed' together may result in recoveries moving to an earlier reinsurance contract. This occurred with US savings and Loans losses, where claims may have been made against the directors and officers, legal advisers and auditors of a given S&L at different times. The date of the earliest of these original claims would be the date that determines which reinsurance contract should respond.
5. The processing of reinsurance recoveries (whatever the form of reinsurance) for both paid and outstanding may not be in parallel with the inwards claims development and can give rise to substantial distortions in net development from period to period. Even the transition from outstanding recovery to a paid recovery may not be in line with inwards movements. This tends to give a more erratic development for figures net of reinsurance in comparison with the corresponding gross development. Hence it is important to compare gross and net development and the proportions of inwards claims that are recovered over time. It would also be preferable to split these proportions recovered into different forms of reinsurance if possible to understand more fully how the gross to net losses are derived.
6. This may highlight reinsurance recoveries that are missed, for example, facultative reinsurance on latent Disease claims. Omission or over recovery may also result from poor attention to the detail of wordings and again can result in large jumps (positive or negative) in the level of reinsurance recoveries. Further complications arise out of warranties on outwards contracts which may lead to losses being recoverable in one period but not in the next (or even repayable in the next) as a result of movements in the size of the original loss. This uncertainty will extend up to the settlement date and particular examples occur in aviation business.



7. Reinsurance recoveries entries should be checked as to whether they refer to actual cash received or booked as this could further exacerbate timing differences and the allowance for bad debts.
8. Reporting of the recoverable paid and outstanding will also depend on the company or syndicates procedures e.g. frequency of advice to the market. Outstandings in particular may be subject to infrequent adjustment both on excess of loss contracts as well as proportional contracts. Information regarding individual large losses or catastrophes within proportional contracts could also be a problem. For catastrophe losses advice to the market *may not be frequent enough if the loss is rapidly increasing and may require weekly update rather than monthly or quarterly.*
9. LMX spiral losses are an extreme example and the outstandings may be of little value given the administrative time to circulate the information around the market. This could give rise to redundant outstandings particularly where priorities are given to the collection paid amounts.

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## 6. Method

1. The Actuary should be aware of the range of methods available for estimating reinsurance recoveries from the gross provision and sensitivity of these to changes. In particular the gearing effect on net reserves where cover may be inadequate on excess of loss treaties. The actuary should be aware of the levels of uncertainty in the estimates of both the inwards and outwards provisions and their combined impact on net results.
2. The choice method to estimate recoveries will depend on a number of factors:
  - data available
  - the complexity of the programme(s), in particular where claims handling issues referred to above arise.
  - complexity of the programme, particularly where reinsurance arrangements inure to the benefit of others, or such things as co-reinsurance which may vary by layer, exclusion etc.
  - the relative size of reinsurance in comparison with gross figures i.e , how dependent are the net reserves on the assumption as to the level of reinsurance recoveries
  - *methods used for estimating gross reserves*
  - classes of business covered
  - the security of reinsurance and the need to assess the provision for bad debts
  - reinsurance premiums particularly where there are substantial adjustment or reinstatement premiums payable.
3. In considering choice of method the levels of recoveries made historically may not be a good guide to those that may be obtained in the future. In particular where the arrangements are complex and more heavily weighted to non proportional rather than proportional. Even using a broad approach, structural changes to programmes are important.
4. For example:
  - The level of excess of loss recovery may not be maintained for IBNR losses particularly if they arise from different new events (definition of "event", "loss" etc. is important in the context of the outwards treaty wording)
  - Cover may be inadequate
  - Co-reinsurance may be at different levels on different layers, programmes and underwriting years

- Common account recoveries may be made in some years and not in others, and also cover may be inadequate. The latter may be difficult to check unless adequate information on the underlying losses is provided.
5. In considering the level of recoveries the distinction between movements on new (non-clashing) or existing recoverable losses is important in determining where recoveries may be made in the future.
  6. The above distortions can therefore make the use of ratio methods awkward (e.g., using the same IBNR/outstanding gross to net ratio for reinsurance as for gross or assuming IBNR recoveries will follow the existing levels of outstanding) and may not reflect the details of the programme. Triangle methods need to be consistent with gross development and a projection of reinsurance recoveries needs to be considered with care otherwise it could be unstable particularly if further distorted by erratic processing of recoveries.
  7. Direct methods (e.g., using estimates of numbers of losses by size including IBNR) allow much more for variability but are time consuming to apply to a complex programme particularly where they are at large number of losses. Curve fitting can also be used to project individual loss development and these should be compared with the total exposure to ensure they are consistent and do not assume a early levelling off of development
  8. Other issues to consider are whether there should be a separate inwards and outwards projections rather than one net, although this will depend heavily on the data available and the distortions referred to above.
  9. Outward reinsurance should be considered from the perspective of a going concern or run-off basis as the latter may expose gaps in cover, i.e. for unexpired risks. This arises where the exposure to inwards losses may take longer to run off than the available cover from existing reinsurance arrangements. Inwards risk on a policy year basis and outwards excess of loss on an occurrence basis would be an example of this type of mismatch. Even for a going concern significant changes in terms and conditions can give rise to an inadequacy of cover for business already written, for example imposition of warranties, where none exist on exposure from existing business. It is important to recognise that exposures may not be uniform over the year and any changes in the reinsurance programme should be considered in this light. The imposition of aggregate deductibles, for example could give rise to a much higher retention for the first loss.
  10. Bad or doubtful debts will need specific comment in the opinion as to whether this has been dealt with. Depending on the data available a range of methods can be used, from a fixed percentage to future reinsurance recoveries or varying percentages according to reinsurer. To estimate the reserve, it is possible to apply specific percentages for bad debts to outstanding losses, and ideally IBNR recoveries should be allocated to each outwards arrangement.

11. An in-house actuary may be able to be involved in a full security analysis, whereas an external actuary may have a conflict with other clients. In any case, it should be clearly stated to what extent the actuary has relied on the client's own (or other third party's) ratings and percentage of outstanding debt funded in the calculation of a bad debt provision for IBNR.
12. If bad debts are to be included it is necessary to identify where the largest exposures arise to ensure the outwards IBNR is properly and adequately allocated to arrangements.
13. Security can be a problem for facultative reinsurance as there is often inadequate vetting for built in reinsurance a full knowledge of panel members may not be available. Often gross is used when referring to gross less facultative reinsurances, particularly where these entries are booked into the accounts net of these facultative arrangements.

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## 7. Classification

1. Traditional reinsurance programmes are made up of quota share, surplus, facultative, risk excess, general excess of loss. The 1993 GISG paper largely concentrates on the last two. In addition, there may be one or more non-traditional (financial or finite-risk) components within a programme.
2. The outwards reinsurance programme is one feature that a company can change significantly, and is likely to have done so over a period of time. The past is therefore not always a good guide to the future. The actuary can assess this after obtaining details of each year's programme, ideally summarised in graphical form.
3. The statistics received for outwards reinsurance may vary greatly between companies or over time within the same company. Timing of recovery payments relative to the gross claims to which they relate may be delayed. As with inwards business, payments may reflect agreed claim settlements rather than actual cash. The treatment of payments may be different between inwards and outwards. The inclusion of 'outstandings' in the historical statistics may or may not occur. Where they are available, the outstandings may or may not include accrued recoveries (i.e. payments requested but not yet received from reinsurers, based on gross paid losses) and may or may not include potential recoveries based on gross outstanding losses.
4. Each different type of outwards reinsurance may be handled differently within the administration and statistical system. Facultative contracts, proportional treaties and risk excess treaties can be (but may not always be in practice) applied automatically when each individual claim is updated, while catastrophe and other aggregate excess of loss treaties need consideration of multiple claims within the class protected. The date of loss for the inwards loss may not be the appropriate date of loss for the outwards recovery. This and the differences in the nature of the cover will mean that different approaches may be preferable for the projection of recoveries from each type.
5. Quota shares may not always apply to an entire gross class of business, so a simple pro-rata estimate based on gross projections may be inaccurate. Surplus treaties and facultative reinsurance will also apply selectively to the gross business, so the gross analysis may not give a precise guide to the reinsurance.
6. Risk excess treaties apply to large losses from individual policies, e.g. fire and explosions, while general or catastrophe excess of loss treaties apply to accumulations of retained losses from the same event, such as earthquakes, windstorms and flood.
7. In the absence of losses, e.g. in an early development period, it may be helpful to make an initial assessment of excess of loss treaties by reference to the line size and limits profile of the classes of business covered by the treaty. Conceptually, this requires a size of loss distribution applied to the policy limits. Any such assessment should be consistent with that underlying the inwards estimates.

8. There will be differences in the way losses are reported and settled. The large losses may be reported sooner but take longer to settle than smaller losses. The development pattern, measured from the start of the underwriting or accident year, will depend on the precise date of loss.
9. Financial reinsurance' may be classified for accounting purposes as one of the traditional classes (e.g. excess of loss or quota share). There are no general rules on how this should be assessed, as each individual contract is tailor made to the cedant, and understanding the precise contract terms is important. The accounting treatment of some financial reinsurance contracts may be different from other reinsurance, and this should be taken into account in any actuarial assessment.
10. For some reinsurance contracts either the premiums or the limits may vary depending on the volume of business written or to be written in future. In these circumstances, if it is thought to be material, the actuary will need to consider the purpose for which the opinion is being produced and whether a continuation of business as normal is the appropriate assumption.
11. Many arguments suggest that outwards reinsurance is best treated as separate, negative classes of business. Sometimes, however, administrative systems are set up to produce net figures rather than gross figures. When reinsurance is applied, some allocation may be done to spread the reinsurance premiums (and to some extent the recoveries) over the sub-classes being protected. Understanding the basis of these allocations and the implications can be important.
12. For non-proportional treaties, the allocation may be done on a basis that does not necessarily reflect the exposure to the treaty. The allocation to year of origin may not coincide with the year of origin for gross business, e.g. for gross business it may be by underwriting year while for outwards reinsurance it may be by treaty year. Aggregate deductibles and limits are difficult to allocate down to the level of detail mentioned above. Looking at net statistics may therefore give a false perspective of profitability by class. It may also be more difficult to assess the likely exhaustion of reinsurance. In itself, profitability analysis may require some allocation of reinsurance, but this is outside the scope of this paper.
13. Where separate reinsurance statistics are available, a common split is between facultative, proportional treaty and non-proportional treaty. Many actuaries have found it helpful to consider these types of reinsurance separately, and to use different methods to estimate recoveries. A further split that could be made is between working layer and catastrophe/clash layers, and between specifics and generals. Large losses can be split between programmes and layers to see where the development is occurring. The existence of limited or unlimited reinstatements may also affect the recoveries estimated.
14. Some working layer treaties may have swing adjustments. Catastrophe excess of loss treaties often have reinstatement premiums payable. The reinstatement premiums could be pro-rata to time as well as pro-rata to amount. The loss sensitive element of premiums is not often segregated from other premium statistics, but may make assessment more easy. Reinstatement premium protection policies may have been bought.

15. Latent claims give rise to special problems (e.g. reinsurance security, wording of coverage, applicability of market agreements, definition of event). The following comments are wider than just latent claims, but are areas in which extra care is needed with regard to latent claims issues.
16. Reinsurance security and the estimation of bad and doubtful debts is a difficult area. The accounting rules may not always identify with an actuary's idea of best estimate. The accountants typically set up provisions for specific reinsurers, applying judgements that may take the form of a percentage recoverable. This percentage may differ among the following items:
- outstanding balances (i.e. balances that have been presented to the reinsurer for settlement)
  - accrued recoveries (i.e. recoveries due in respect of paid inwards claims but that have not been presented for settlement)
  - outstanding recoverables (i.e. recoveries that would become due if the inwards losses are settled for the amount on the books as outstanding), and
  - IBNR (i.e. the remaining recoveries in respect of all claims over and above the amounts described above).
17. The percentage may or may not allow for differences in the timing of payments. e.g. depending on the class of business reinsured. The percentage may reflect the current status of the reinsurer (e.g. in liquidation, solvent but not paying, paying claims but not actively trading, actively trading) but is unlikely to provide a statistical provision for apparently healthy companies becoming insolvent. The accounting provisions probably allow for any rights of set off.
18. Unrecoverable reinsurance may be treated in different ways in the statistics provided to the actuary, and may also be treated differently at different points in time. The recoveries may be booked as if they will be fully recovered, or the proportion that has not been collected may be set to zero or included within outstandings.
19. The basis on which reinsurance is recoverable is partly determined by market practice as well as contract wording. The contract wording may be subject to different interpretations from that which is understood by any one individual or organisation, and judicial decisions or arbitration procedures may result in a revision of the basis on which a company or the entire market has previously applied assessments. The contract wording itself may be vague or ambiguous or explicitly allow discretion in the application of the contract.
20. "Pay as paid" and other disputes can have a significant impact on the reserves. The actuary may need to appreciate the possible effects of applying a different interpretation to that applied historically. This appreciation should extend to the recognition that cedants' advices on inwards reinsurance may have been prepared under conventions that differ from those used by the accepting reinsurer and among themselves, as well as each company's conventions perhaps differing over time. There is almost never enough information to make good assessments on two or more alternative bases.

21. Examples of these conventions include coverage for asbestos claims as one event in LMX treaties, where companies that do not accept this treatment may not record such advices on their systems and will not advise their own reinsurers of these losses as one event. It is not yet clear how reinsurance will respond to pollution losses. Another example is pay as paid, where some reinsurers have not accepted claims from insolvent cedants which have agreed in principle the gross amount of a claim but are unable to pay the full amount. A further example is the application of losses to treaties in a date of loss order or in a date of settlement order.
22. Other disputes as to the validity of a claim may arise, e.g. for extra contractual payments or where there is a dispute over whether all or part (e.g. the punitive damages element) of the original claim is covered. There can be disputes over whether a series of claims arise from one event or a number of events, e.g. a global settlement in respect of a mass tort claim.