EQUALISATION RESERVES
WORKING PARTY
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CONTENTS

1. INTRODUCTION

For a number of years, United Kingdom insurance companies have sought the introduction of equalisation reserves on which tax relief would be given For financial years ending on or after 23 December 1996, this wish will become reality.

It is therefore an opportune time to review the scheme which has been implemented by the Insurance Companies (Reserves) Regulations 1996, and to consider the likely effect on companies. This paper reviews the background, legal framework, rules, accounting and taxation aspects. The operation of the rules had they existed historically is examined, and modelling of the future operation of the rules presented. The effect of insurance cycles is considered, and the likely influence on reinsurance is reviewed. The claims event system, which has not been included in the initial scheme, but may be considered as an amendment to the regulations at a later stage, is re-visited. Finally, possible future developments are commented on and the role for the Actuarial profession is discussed.

The views expressed in this paper are those of the working party as a whole and do not necessarily reflect the views of any one individual or any organisation that any member has ever been associated with. Whilst the working party has used its best endeavours to ensure accuracy, any person or organisation using this paper to make decisions should check the accuracy themselves and seek their own professional advice.

2. BACKGROUND TO THE INTRODUCTION OF EQUALISATION RESERVES

Many countries, including some members of the European Community (EC), allow the establishment of equalisation or fluctuation reserves on non-life business from pre-tax income. As this practice did not extend to the United Kingdom, this placed UK-based insurers at a competitive disadvantage, particularly with the establishment of the single EC market in insurance. The Third Non-Life Directive enabled insurance companies to operate anywhere in the EC under a single authorisation, subject, essentially, to home state supervision, rules and practices. Thus, EC companies based outside the UK could gain from a tax advantage in the single market, as they are permitted to establish equalisation reserves on their UK branch business.

Equalisation reserves have been considered several times in the past by the General Insurance Study Group (GISG). The subject was first reviewed in 1980, and considered further in 1985 and 1991. The 1991 GISG paper covered the subject in some detail, as well as presenting the UK Credit Insurance Regulations and examining the results of a survey on equalisation reserves over the UK market. A further GISG paper in 1992 considered the various European schemes - describing the systems, the tax treatment, their effectiveness, and the requirements for actuaries to monitor them. A brief paper was produced for the 1993 GISG Convention outlining the contents of the July 1993 consultation document, and this was updated by a note in 1994.

The Insurance Companies (Credit Insurance) Regulations 1990 came into force in September 1990, and required all companies writing Credit Insurance business to maintain and publish an equalisation reserve for this business. It defined the business

covered, authorised under the Department of Trade and Industry (DTI) Class 14, the exemptions, the methods of calculation (four, of which two were statistical), and set out the forms to be used. Transfers to these reserves were not tax allowable.

In July 1993 a consultation document was produced jointly by the Inland Revenue and the DTI, covering the use of equalisation reserves for business excluding credit insurance It was accepted that at the time a few companies did use these reserves to smooth profits, and in these cases any transfer was regarded as an appropriation of profits rather than an expense associated with obtaining insurance business. As a result transfers in and out of these reserves were ignored for tax purposes. The document asked for comment on a number of issues, mainly: whether or not there should be a supervisory requirement for equalisation reserves on volatile classes of business; if so, which classes should be covered; and whether the transfers into the reserves should be treated as trading expenses. The document described the current UK industry, its regulatory and fiscal regime, how equalisation reserves operated in the rest of Europe, the arguments for change (including to the regulatory and fiscal regimes), and how the reserve could be calculated.

A number of issues were resolved during 1994 by a working group consisting of representatives from the Association of British Insurers (ABI), the London Insurance and Reinsurance Market Association (LIRMA), the Government Actuary's Department (GAD), the DTI, and the Inland Revenue. This drew up a proposed set of rules, resolving most of the outstanding issues. A few issues were left open: the use of de minimis rules, accelerated start up provisions, and the layout of the additional DTI forms needed.

A further consultation document was issued jointly by the DTI and Inland Revenue in April 1995. It proposed that tax relief be given on transfers into equalisation reserves

for non-life business, and set out the required regulatory framework for the operation of such rules. The rules defined the coverage of the regulations, limiting this to groups of business displaying significant claims volatility. Rules were determined for transfers into the reserve, the maximum reserve size, and transfers out. It was decided that owing to practical difficulties the claims event system would not be used - at least initially. The rules governing Credit Insurance (as a result of a 1987 EC Directive) would be amended to allow tax relief, to ensure clarity in the calculation, and to allow only the use of method one. The credit insurance equalisation reserves would still need to be maintained separately from those for other business.

The final consultation document, with draft regulations, was issued by the DTI in October 1995, setting out proposals that were little changed from those of the second consultation document, with the issue of accelerated start up still being unresolved. A few minor changes were made as a result of responses received, being primarily an increase in the trigger ratio for non-proportional treaty reinsurance on property and consequential loss, and the recognition that mortgage indemnity is nearly all written in class 14 and therefore covered by the part of the regulations relating to credit insurance. Insurance of goods in transit was also excluded from the scheme.

Section 3 of this paper gives details of the legislation implementing the new scheme.

3. LEGISLATION IMPLEMENTING EQUALISATION RESERVES

3.1 The major piece of legislation dealing with the prudential regulation of insurance companies is the Insurance Companies Act 1982 (ICA82), which has been amended in subsequent years.

Equalisation reserves, first required for Credit Insurance business, were introduced following an EC Directive (87/343/EEC of 22 June 1987) via the Insurance Companies (Credit Insurance) Regulations 1990. These equalisation reserves were not allowable for tax relief purposes.

Primary legislation was needed to amend ICA82 to allow for a framework of equalisation reserves to be included for statutory solvency purposes. Section 34A of ICA82 was inserted by the Insurance Companies (Reserves) Act 1995, which was passed in July 1995.

The Insurance Companies (Reserves) Regulations 1996 introduced the detailed workings of the current equalisation reserves regime - the forms that the reserves are reported on are included in the Insurance Companies (Accounts and Statements) Regulations 1996.

3.2 The above legislation sets out the formal requirements for equalisation reserves to form part of the regulatory regime for the prudential supervision of insurance companies in the UK. This does not by itself confer the right to tax relief. This is included in other legislation. Tax relief was first announced in the November 1995 Budget statement. Section 166 of the Finance Act 1996 enabled tax relief to be given, as detailed in Schedule 32 to the Act.

4. SUMMARY OF THE RULES FOR OPERATION OF EQUALISATION RESERVES

4.1 Introduction and classes covered

Full details are included in the Insurance Companies (Reserves) Regulations 1996. These contain details of how the rules operate in various special circumstances. The following is a summary of the main points of the regime:

A company operates two equalisation reserves, one for credit insurance business, and one for all of the other business included in the scheme. In each case, at the end of each financial year a company calculates the amount of any transfer to be made into the reserve, and separately determines the amount of any transfer out of the reserve. In addition, there is an overriding calculation to ensure that at the end of the financial year the equalisation reserve is not greater than its maximum permitted value.

For other than credit insurance business, there are five categories of business for which equalisation reserves are required. The following table describes the categories - see the Regulations for the strict definitions:

Business Group A	property damage including corresponding proportional reinsurance treaty business
Business Group B	direct, facultative and proportional treaty consequential loss risks
Business Group C	marine and aviation business, including corresponding reinsurance treaty business
Business Group D	nuclear risks
Business Group E	non-proportional reinsurance treaty business categories corresponding to business in accounting class 6 (property damage) and non-proportional reinsurance treaty consequential loss risks

The business within each business group is further subdivided between business accounted for on an accident year basis and business accounted for on an underwriting year basis.

Credit insurance covers all business (except reinsurance business) that is part of authorisation class 14 - this includes most mortgage indemnity business.

Sections 4.2 to 4.5 below deal with the other than credit insurance equalisation reserve - credit insurance is dealt with in section 4.6.

Other than credit insurance business

4.2 Transfers in

Transfers into the reserve are determined as a percentage of net written premium as detailed in the following table (where net written premium is gross written premium less reinsurance premiums payable under reinsurance ceded, including adjustments for previous financial years):

Business Group	Percentage of net premiums written
A	3%
B	3%
C	6%
D	75%
E	11%

4.3 Transfers out

Transfers out are determined for each business group separately. The amount to be transferred is the amount of any "abnormal loss". This is determined according to separate rules depending on whether the business is accounted for on an accident year basis or on an underwriting year basis. In principle, the abnormal loss is the excess of incurred claims (net of reinsurance and other recoveries, excluding claims management costs but including direct claims handling costs) over the percentages of net (of reinsurance) premiums shown below. Note that the strict definitions are, necessarily, different for the accident and underwriting year accounting bases, and that the amounts are calculated separately for these two bases and then aggregated for each business group, and this aggregate amount is transferred, subject to the business group maximum. For the accident year accounting basis, net premiums earned are used, whereas for the underwriting year basis, net premiums written are used.

Business Group	Percentage of net premiums earned/written
A	72.5%
B	72.5%
C	95%
D	25%
E	100%

4.4 Maximum size of reserve

The maximum size of the equalisation reserve is used for two purposes: for limiting the amount of the transfer out for each individual business group, and

for determining the maximum aggregate size of the equalisation reserve. The maxima are:

Business Group	Percentage of average net premiums written
A	20%
B	20%
C	40%
D	600%
E	75%

The net premiums written are averaged over the last five financial years unless business has not been written for five years, in which case a shorter period is used. There are special rules for non-annual financial years.

4.5 Combined classes effect

For other than credit insurance business there is only one equalisation reserve, which is all potentially available to meet abnormal losses in any one business group. It is quite possible for one business group to cause a transfer out that completely exhausts the equalisation reserve, even though that reserve has been built up partly by transfers in from other classes. Any transfer out in respect of an individual business group is however subject to the maximum equalisation reserve for that group.

Credit insurance

4.6 Credit insurance equalisation reserves work on a different system - under the original requirements, companies could choose one of four methods. Now that tax relief is being granted, there is only one method available. The

technical result is determined at the end of each financial year, this essentially being the net premiums less net claims incurred less claims management costs. Note that different definitions again apply for business accounted for on an accident year basis and business accounted for on an underwriting year basis. If there is a technical surplus, 75% of the surplus (subject to a maximum of 12% of net premiums written) is transferred to the reserve. All of any deficit is transferred from the reserve. The maximum size of the reserve is 150% of the highest annual amount of net written premiums in the last five financial years.

Note that credit insurance equalisation reserves are not available to meet abnormal losses that may arise on other business and vice versa.

4.7 Miscellaneous

The detailed regulations specify various exclusions from the system of equalisation reserves, separately for credit insurance business and other business. For the other than credit insurance business, these include assessable mutual organisations, small companies (total premium for the prescribed business less than 1.5 million ECUs), and companies for whom the prescribed business is only a small part of their total (less than 4% of the total premium, provided it is not more than 2.5 million ECUs).

There are also transitional rules where a company moves in or out of the scope of the regulations, and special rules for transfers of business under Schedule 2C or by novation. There is also more detail regarding the specific treatment of accident year and underwriting year business. Note that the regulations do not allow an accelerated start-up option as had at one time been considered.

5. ACCOUNTING ISSUES

Schedule 9A to the Companies Act 1985 was introduced by the Companies Act 1985 (Insurance Companies Accounts) Regulations 1993, and implements the EC Insurance Accounts Directive (ECIAD). This requires additional disclosure in the shareholder accounts, and the auditors to certify that the accounts give a "true and fair" view of the company and its profit or loss at the end of its financial year.

Equalisation reserves are included as technical provisions under liabilities in the balance sheet, with an associated appropriation through the profit and loss account to reflect the transfers in and out. This is a requirement of the ECIAD.

The accounting profession believes that the definition of equalisation reserves (which cover future events) is incompatible with the definition of liabilities under generally accepted accounting principles. It is argued that such a conflict means that the accounts cannot show a "true and fair" view, and so the aforementioned treatment should yield to the "true and fair" view. The Government, however, considers that the above should not stop auditors certifying a "true and fair" opinion. It is accepted however that guidance may be needed on the extent to which additional disclosure or statements is necessary, and additional disclosure requirements have been suggested.

As a liability, the equalisation reserve is included as part of the general business technical provisions on Form 15 of the new style DTI Returns applicable for financial years ending on or after 23 December 1996. Line 14 is used for equalisation "provisions" for credit business, and line 15 for other than credit business. Line 12 on Form 16 shows the transfer to or from the reserve. Form 37 summarises the calculation of the equalisation provision with an "equalisation provisions technical

account" being shown on Form 38 for accident year accounting and Form 39 for underwriting year accounting.

The inclusion of equalisation reserves as a liability reduces the excess assets available over the Required Minimum Margin (RMM). As a result, the solvency ratio will appear to be lower. There will, however, be no change in the RMM, so statutorily enforced financial strength will in fact be increased when an equalisation reserve greater than zero is held.

The format of the technical profit and loss account and the balance sheet, showing where equalisation reserves should be included are set out below. With the exception of technical provisions, only summary level items are shown.

Profit and Loss Account: Technical account - general business

Earned premiums, net of reinsurance
Allocated investment return transferred from the non-technical account
Other technical income, net of reinsurance
Claims incurred, net of reinsurance
Changes in other technical provisions, net of reinsurance
Bonuses and rebates, net of reinsurance
Net operating expenses
Other technical charges, net of reinsurance
Investment expenses and charges
Change in the equalisation provision
Sub-total (balance on the technical account for general business)

Profit and loss account: Non-technical account
The non-technical account does not include any items in respect of equalisation reserves.

Balance sheet

ASSETS

Called up share capital not paid
Intangible assets
Investments
Reinsurers' share of technical provisions
Debtors
Other assets
Prepayments and accrued income
TOTAL ASSETS

LIABILITIES

Capital and reserves
Subordinated liabilities
Fund for future appropriations
Technical provisions
    Provision for unearned premiums
    Claims outstanding
    Provision for bonuses and rebates
    Equalisation provision
    Other technical provisions
Provisions for other liabilities and charges
Deposits received from reinsurers
Creditors
Accruals and deferred income
TOTAL LIABILITIES

6. TAXATION

Prior to the amendment of the ICA82, it was not mandatory to set up equalisation reserves except for credit insurance, and relatively few companies used them. No tax relief was allowed on transfers into equalisation reserves and, correspondingly, no tax was payable on transfers out.

However, under section 166 of the Finance Act 1996, transfers into the reserve will be treated as a deduction from pre-tax profits. To correspond with the tax treatment on establishment of the reserve, any transfer out will be treated as part of the taxable income of the company in the year in which it is made. This is regardless of whether the transfer out was caused by claims in excess of the trigger point, or an alteration in the maximum reserve level.

An important concession was made that allows companies to make an election in writing to waive tax relief on transfers into the equalisation reserve. Any transfer out will similarly be free of tax until it exceeds the aggregate amount of the unrelieved reserve brought forward. This is important, as companies might otherwise lose other tax relief at the time of transfers into equalisation reserves and yet pay tax on withdrawals. An example of this would be where a company pays a large amount of overseas tax, for instance as a result of having an overseas branch. Double taxation relief can be significant, and if there was an insufficient UK taxation liability to offset the overseas tax as a result of establishing equalisation reserves, the company would lose out. Without this concession, tax would still have been payable on the transfer out, even though the tax relief given on the transfer in would effectively only have replaced other forms of relief.

The Treasury can make regulations to cover unusual situations: mutuals, overseas companies, and those with non-annual accounting bases. Additionally it can allow the application of the general position to equivalent reserves held by EC companies carrying out business in the UK via a branch or agency, and for business carried on outside the UK by a UK resident company.

This legislation has some effect on captives, and other controlled foreign companies. If their parent is based in the UK, they must now calculate their taxable profits according to UK accounting methodology. As a result, they may be able to claim relief on equalisation reserves when calculating taxable profits for UK corporation tax purposes.

Equalisation reserves are required for the UK branches of overseas insurers within the scope of DTI regulation. The supervision of insurers from other EC member states is the sole responsibility of their home state, so the DTI cannot require the setting up of reserves. However, the same tax relief will be allowed as if the insurer were regulated by the DTI on amounts that the company sets aside in this country, provided the conditions prescribed by regulations made by the Treasury are satisfied.

Lloyd's business is not covered by this legislation. However, in the case of individual names there are similar arrangements that allow the building up of reserves from pre-tax profits by transferring a proportion of the profits into a reserve. This can be used to meet future losses. Corporate capital providers are trying to obtain tax relief on catastrophe reserves as well, as they are not covered by either of the above arrangements. They would prefer a voluntary system within a framework of rules, with transfers based on profits to allow maximum flexibility.

7. DIFFERENCES BETWEEN CLASSES COVERED

The areas of business to be covered by the regulations were discussed with a wide cross-section of the insurance industry, as well as other interested parties. These areas needed to be well defined, and the groupings had to be such as not to cause companies to change the way business is reported. Claims patterns were analysed, mainly relating to the twelve year period 1981 to 1992. Separate analyses were performed for business that is accounted for on a one year basis and funded business, but this did not indicate a need to separate them.

7.1 Business Group A - Property

This covers accounting class 6 business which comprises the following general business classes:

4 Railways - damage to or loss of railway rolling stock.

8 Property - loss of or damage to property excluding vehicles and marine, aviation and transport business, arising from fire and natural forces.

9 Property - loss of or damage to property excluding vehicles and marine, aviation and transport business, arising from any event not covered by fire and natural forces.

Property is a very large class of business, accounting for over 20% of premiums written in the UK general insurance market. Claims patterns can be very erratic - for example, the storms of 1987 and 1990 had a very large effect on the overall results of this class. The business is cyclical, but without such pronounced cyclical movements as exhibited by classes such as marine. Claims are also affected by the state of the economy. Equalisation reserves

will thus smooth the effects of these influences to at least some extent. Owing to the wide spread of risk, both geographical and as a result of the different coverage provided, the transfer into the equalisation reserve and the maximum reserve level allowed have been set at a lower level than for other classes.

7.2 Business Group B - Consequential loss

This class is defined as direct, facultative and proportional reinsurance treaty consequential loss risks. The definition is not made in terms of accounting or general business classes, but would be expected to include business written under general business class 16 (miscellaneous financial loss - interruptions or reductions in the scope of business, the incurring of unforeseen expenses, and business excluded from other classes).

The percentages for transfers and the maximum for this group are the same as for property. The causes of property claims and consequential loss claims are often (but not always) the same, which explains why the parameters are identical.

7.3 Business Group C - Marine and aviation

In the case of marine and aviation, the non-proportional as well as other treaty business is included in order to be in line with the DTI Returns.

The original intention was to cover accounting classes 3, 4 and 5, which would have been convenient from a regulatory viewpoint. However, after representation from the industry, accounting class 5 business (i.e. transport - general business class 7) was not felt to display sufficient claims volatility,

and so only accounting classes 3 (aircraft damage and liability - general business classes 5 and 11) and 4 (ships damage and liability - general business classes 6 and 12) are included.

This business is exposed to the risks of very large catastrophic claims, as was seen in the late 1980s with Hurricane Hugo, Piper Alpha, and Exxon Valdez among others. It is affected by a pronounced insurance cycle which will contribute to the volatility of results, and is also influenced by the state of the world economy. The effect of these features on an insurer's results should be smoothed by equalisation reserves.

7.4 Business Group D - Nuclear

This business is written as a result of the pooling arrangements run by the British Insurance Atomic Energy Committee. It covers both the obvious large risks, such as British Nuclear Fuels Limited, and smaller risks such as the materials and processes used at universities etc. In addition, there are pooling arrangements with other nuclear pools, run by other countries, which result in the exchange of business. In general, cover is provided for both damage and liability, although insurance companies contribute fixed amounts of cover, the aggregation of which determines the maximum available. The premiums and claims are readily identifiable, even though this is not a separate class for DTI purposes.

The claims ratio for this business is usually very low, and no major incident has resulted in a claim on the pool. However, any major claim would be very large, requiring many years' profits to cover the outlay, making this business ideally suited to equalisation reserves.

7.5 Business Group E - Non-proportional reinsurance treaty business

This business has borne much of the impact of the catastrophes in recent years. The higher layers are more volatile, as they are affected by less frequent but more severe claims, and the rates are lower. Results fluctuate, depending on the incidence of large claims such as the 1990 storms. Similarly, some classes of business are more exposed to catastrophes, but the method of setting the equalisation reserve does not reflect these differing exposures.

7.6 Credit insurance

Mortgage indemnity business was to be included as a separate class under the original proposals, but the final scheme is based on the assumption that this will normally be reported as credit insurance - so there is no separate category for mortgage indemnity.

Most of the claims in this class arise as a result of the failure of debtors to pay debts when they are due. The business is defined as all business that falls within general business class 14 - Credit Insurance - that is not reinsurance business.

This business is closely linked to the state of the economy and the housing market. Claims from mortgage indemnity business peaked in 1991 as a result of the recession and fall in house prices. Claims are cyclical, and periods of severe attritional losses can occur. It is clearly prudent to put reserves aside to meet periods of adverse experience, and this is the aim of the credit insurance equalisation reserve - it is not aimed at losses from a single, short time-scale,

event. Accordingly, a claims event system would not appear to be appropriate for this class.

8. A STUDY OF HOW THE RULES WOULD HAVE OPERATED HISTORICALLY

8.1 Period studied

Data necessary for studying the operation of claims equalisation reserves has been collected for the property class for various companies over the period of 1981 to 1994. To a considerable extent this was a practical decision, covering the period since the introduction of the revised-style DTI returns in 1981. Greater detail is available in these returns than earlier ones, and the need for collation of data in different formats is avoided.

The rules determining the maximum size of the equalisation reserve operate using a five year averaging method. Comparisons utilising a full five year averaging process are only available for the ten year period of 1985 to 1994, although a maximum reserve will not normally be achieved for a minimum of about seven years unless a company's business is declining.

Although there is no ideal or long enough period to study, the period under consideration includes the 1987 and 1990 catastrophes as well as other lesser events and in excess of one insurance cycle for the business under consideration.

8.2 Companies studied

Eight companies were chosen for the study to represent various different types of company writing business in the UK property market. Three of the large composite companies have been included in the study as, overall, the

composites have written a large slice of this market during the period under consideration. The other companies include two of the traditional home service companies, and three companies likely to be writing mainly a mixture of commercial business, one of them a semi-specialist writer. Within the three groupings, the companies have been chosen, by rough inspection, to be otherwise as diverse as possible, e.g. representing small and large examples of the genre.

Direct writers have not been included in the study as none of these companies have been writing property business for a sufficiently long period.

In later discussion the companies are referred to as follows:

composites	A, B & C (all large)
home service	D (small) & E (large)
other	F, G & H.

8.3 Data derivation and usage in model

The data used for the various companies studied comes from various forms that are contained in the returns made to the DTI. The working party are grateful to The Software Vineyard for lending us the INCA system to enable us to extract the relevant data.

Definitions of the items used in the model are given below, the references to DTI forms being those applicable before the implementation of the Insurance Companies (Accounts and Statements) Regulations 1996.

Transfers in - 3% of net written premium (figure used is form 21 item 41.5).

Reserve ceiling - 20% of the average of the current and previous four years' net written premium (as defined above).

Transfers out - Excess of company claims ratio over trigger ratio, where the company claims ratio is net claims incurred (figure used is form 22 items 13.4 + 16.4) divided by net earned premiums (figure used is form 21 items 11.5 + 29.5 + 31.5).

8.4 Shortcomings in data and method used

A study of past history, as currently being considered, suffers from both theoretical and practical difficulties. Even if all the practical problems of obtaining ideal data from a company under consideration could be overcome, the introduction of equalisation reserves will, in itself, probably change the insurance practice (e.g. reinsurance purchases might be altered). This means that the data being used for the study will not necessarily match the events that would have occurred had equalisation reserves been in place. No attempt has been made to try to allow for the effect of this.

Companies - Although an attempt has been made to use a range of different companies covering a broad spectrum of those writing property business, the group chosen is not necessarily representative. The aim of the exercise was to show how the equalisation reserve operates for different companies. It should be remembered that equalisation reserves for other companies may work in either similar or different fashions from those shown in their grouping or different groupings. With changes in the property insurance market

(particularly household business where the direct writers and banks/building societies are entering the market), the examples may not be representative of those who write business in the future.

Classes covered - Only the property class has been considered in this case study, and within this class only the annual business. The study could in principle be extended to non-annually accounted business and other accounting classes. Further assumptions are required when considering three year accounted business as less of the required data is separately available in the DTI returns. The restriction to one year business reflected the fact that the vast majority of property business is written in this form. In fact, of the companies selected, only two have three year business, and in both cases the amount was small compared with their one year accounted business. Equalisation reserves for other classes of business are unlikely to have responded in a similar fashion over the last ten years as they will have suffered from different insurance cycles and major claims events.

As explained in section 4.5, the calculations relating to equalisation reserves mainly operate at a class level, with restrictions on transfers to or from the equalisation reserve being calculated class by class, but the overall equalisation reserve available is not partitioned. As the model only covers the property class, the full effect of this will not be illustrated. Indeed, it is possible to see transfers out that have been prevented because of exhaustion of the claims equalisation reserve, but that might possibly have been allowed if a larger reserve had built up because the company wrote other business.

Data - The study relies upon data publicly available in the DTI returns. The returns have not been designed with this study in mind and the data contained

is far from ideal. Details of the data and method used are given in Appendix A.

Although basic elements required for the claims equalisation reserves calculations appear available for one year property business, inconsistencies may arise because of potentially different treatment by companies for certain items in their DTI returns. An example is the treatment of expenses related to the settlement of claims. These are treated differently depending upon whether the costs are internal or external. This in turn depends on how companies process their claims. Companies are therefore likely historically to have completed the returns differently depending upon exactly how the claims system operates in their company.

8.5 Output of study

In order to avoid revealing the identity of the specific companies considered, the results of the study have been scaled so that the maximum ceiling fund over the time considered is £100m. The model enables the following main items to be compared for the period under review:

- transfers (in, out and net),
- restrictions on the transfers (in and out),
- the build up of the claims equalisation reserve,
- how this compares with the claims equalisation reserve ceiling,
- equalised claims, and
- how these compare with claims before claims equalisation reserve transfers and premiums.

Calculations showing how the reserves are built up for Company A are presented in Appendix A. The interactions of the various items above are shown graphically in Figures 8.5.1 to 8.5.8 for each of the companies A to H described in section 8.2. The charts show the build up of the claims equalisation reserve, how this compares with the reserve ceiling at the time, net transfers (which effectively illustrate the level to which any claims may benefit from transfers from the equalisation reserve in any year), and restrictions on the transfer.

The charts show wide variations for the different companies, and not necessarily according to the broad grouping (e.g. composite, home service etc.) under which the company was originally selected. The following general observations can be made:

- Half the companies achieve the equalisation reserve ceiling, normally in 1989, before the 1990A catastrophe. Only company D, a small home service company, achieves this for more than two years during the period of the survey. Of those companies that do not achieve the equalisation reserve ceiling, most companies come within striking distance at some point in time.
- Transfers out of the equalisation reserve occur for all but one company (company D, the company mentioned in the previous paragraph) and in most cases for two or more years.
- Restrictions take place on both transfers into and out of the equalisation reserve. The most noticeable restrictions on transfers in (which arise when the reserve ceiling is reached) take place for company D, the company noted above as the only company for which no transfers out

Figure 8.5.1 - Company A

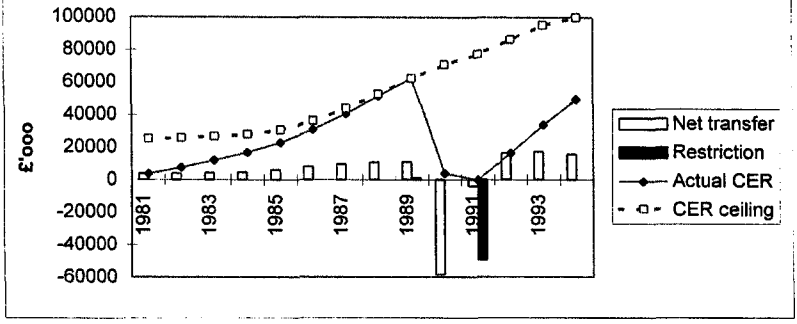


Figure 8.5.2 - Company B

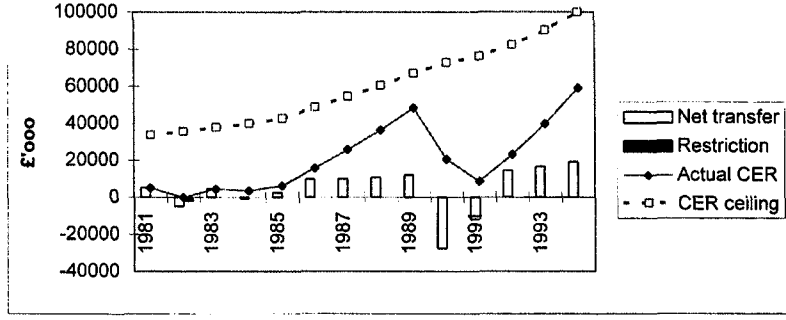


Figure 8.5.3 - Company C

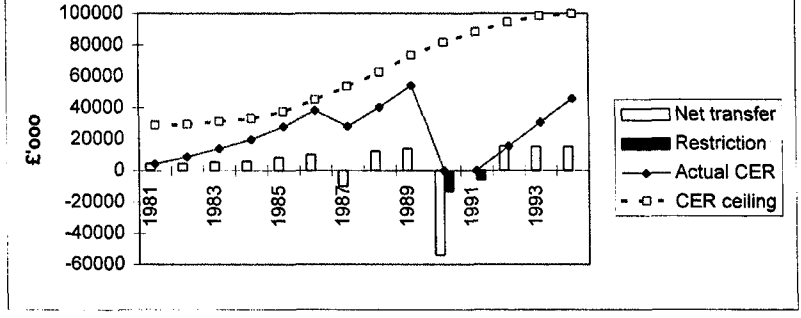


Figure 8.5.4 - Company D

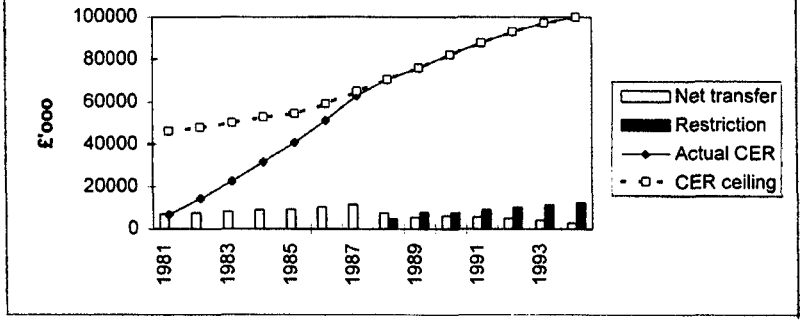


Figure 8.5.5 - Company E

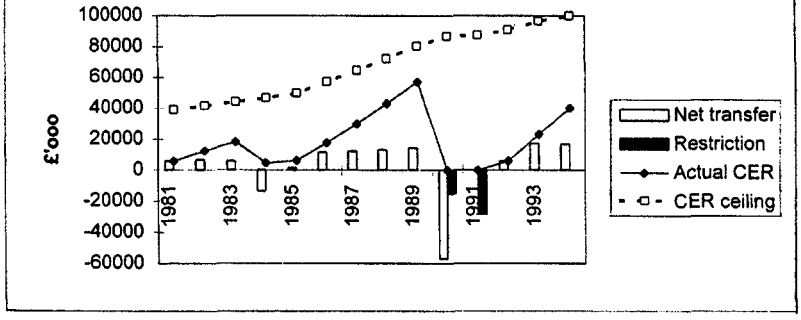


Figure 8.5.6 - Company F

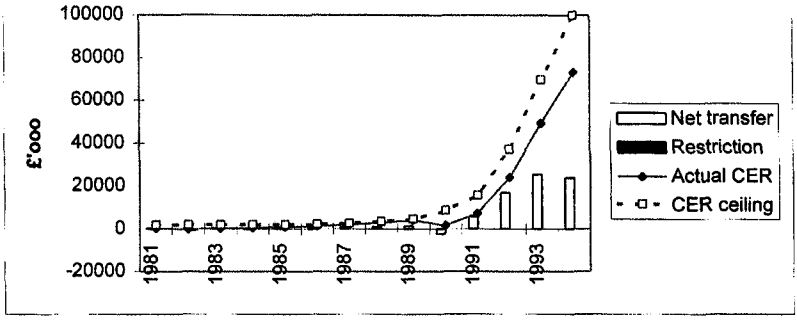


Figure 8.5.7 - Company G

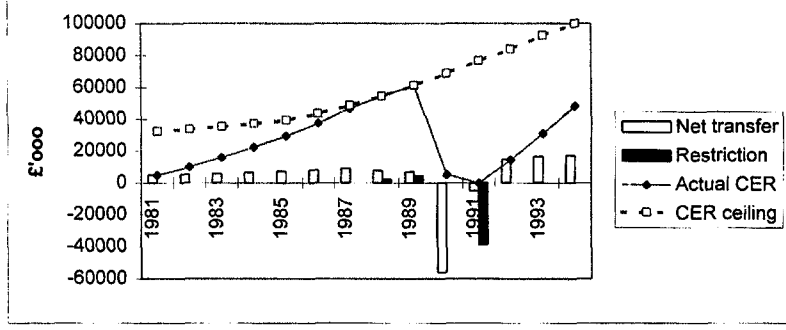
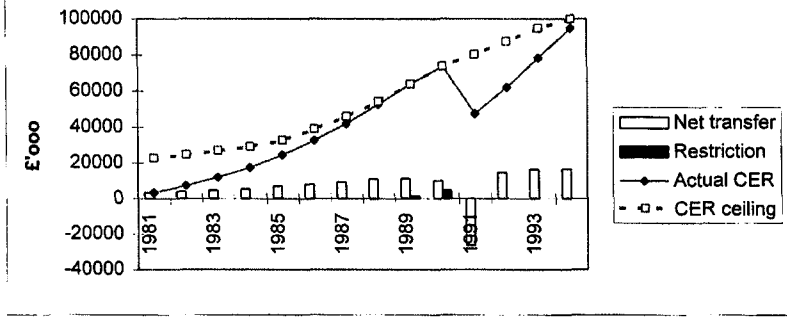


Figure 8.5.8 - Company H



occur. Restrictions on transfers out only occur in the years 1990 and 1991 (see below for further details).

- Companies D and F illustrate, from differing perspectives, the effect of growing premium income on a company's equalisation reserve. Company D, for which transfers into its reserve are restricted for the last seven years, still requires net transfers into its equalisation reserve during these years. This reflects a continually growing equalisation reserve ceiling due to its gradual premium growth. In fact, the ceiling, which is based on a company's average premium over the last five years, reflects the growth in premiums slower than the calculation of the transfer in does, this being based on only the last year's premium. Company F, which exhibits rapid growth over the last four years, shows a widening gap between its growing equalisation reserve and its reserve ceiling.

In the context of the property insurance market, the following observations can be added:

- 1987 was one of the two years during the period considered containing a major catastrophe event (cat 87J). Only company C of the eight companies considered would have made a withdrawal from the claims equalisation reserve for this year. For 1990, the year containing the other major storm claims, six of the eight companies (exceptions are D and H) display withdrawals from the equalisation reserve, mainly of substantial amounts.
- However during 1991, a year when there were no major catastrophe events, six of the eight companies again show withdrawals from their equalisation reserve (the exceptions being company D and F). The withdrawals shown from the reserve would often not have been large.

This is, however, mainly because of a restricted transfer out due to lack of money in the equalisation reserve following the 1990 transfers - in three cases substantial amounts would have been transferred out had the money been available (which might have been the case depending on the other classes of business written by the companies and their effect on the build up of total equalisation reserves).

8.6 Conclusions

The results of the model show quite differing outcomes for the various companies investigated. A list of major weather losses for property business is given in Appendix C, which may give an indication of when withdrawals from the fund may be expected to occur. Unsurprisingly the two largest events, by far, are the storms of 1987 and 1990. The table also indicates that both years also suffered from further bad weather during these years.

In 1990, the majority of companies, as expected, would have made a withdrawal from the equalisation reserve. Similar withdrawals would also have been expected to take place from the equalisation reserve during 1987. However this is not the case and only one company actually triggers such a withdrawal.

On the other hand, there were no major catastrophes during 1991 and most companies still trigger withdrawals from the equalisation reserve. This certainly would not be expected if the equalisation reserve is expected to operate only on clearly time bounded catastrophes. One possible explanation is that the equalisation reserve is responding to various other unexpectedly high attritional type claims. (These included higher levels of subsidence

claims than previously experienced, owing to the long period of dry weather, and recession related claims e.g. theft and arson.) A further possibility is that the insurance cycle was at a low at this time and the equalisation reserve is responding to this.

As well as the equalisation reserve not appearing to respond to one of the notable property catastrophes during the period under consideration, it should be noted that the performance of individual companies' reserves also shows considerable variations. These range from no withdrawals (and a build up to the ceiling within 8 years) at one end of the spectrum to companies suffering withdrawals in the early eighties and never achieving the ceiling at the other end. It appears that experience is very particular to the individual company and its business.

9. CLAIMS EVENT SYSTEM

9.1 Initial proposals for a claims event system

The 1994 working group proposed a claims event system as well as the adopted claims ratio system. The claims event system based transfers out on claims caused by specific events or catastrophes. This is the type of claims incident which traditional reinsurance covers and if one of the aims of equalisation reserves is to avoid money flowing out of the UK to overseas reinsurers then one would hope any equalisation reserve system would respond to specific events or catastrophes.

The claims event system under discussion used the same rules as for the claims ratio system in respect of transfers in and the equalisation reserve limit. The transfer out was to be based on claims events with claims in excess of a deductible. The deductible was to be a percentage of net earned premiums, the tentative proposal being 4.5% for all classes of business to be covered by the scheme. This effectively defined qualifying events based on exposure.

9.2 Why the proposals were put to one side

The claims event proposals were not adopted because it was identified that the system has considerable practical difficulties. One of these is the difficulty of defining an event in a manner which is sufficiently watertight. One definition under consideration was:

"One or more claims are defined to constitute a claims equalisation reserve event if they are attributable to a common proximate cause. The aggregation

of all claims that satisfy the criteria constitutes a 'qualifying claims equalisation reserve event' if the total cost exceeds a certain, defined percentage of the earned premium for the year of account for the class or classes of business concerned."

To the regret of many companies, the Government decided that at first introduction the practical difficulties associated with the event system meant that this option should not be included. The particular practical difficulties identified in the DTI and Inland Revenue April 1995 Consultation Document were:

1 The definition of "event" for this purpose is "a notoriously difficult undertaking".
2 Rules would be needed to distinguish between the occurrence of a single and of several catastrophic events.
3 If recourse to the concept of "proximate cause" is required this is difficult to adopt as evidenced by litigation associated with this phrase between parties to insurance contracts.

The need to interpret data and the application of legal terms was felt to be contrary to the merits of simplicity, certainty and clarity.

If proposals can be developed that overcome all objections, the April 1995 Consultation Document indicates that the regulations may at a later stage be amended to include a claims event system.

Further practical difficulties would potentially arise from having two systems available. If companies have a choice between a claims event system and a

claims ratio system, they could exercise this choice from a taxation perspective and not in order to adopt a method which would fundamentally operate more satisfactorily. Although for the property class the claims event system would appear to be attractive, this is not so clear for other classes, and the use of two different methods (for different classes) by the same company could lead to difficulties. Given that the claims ratio system is now operational, there would need to be transition rules for a company changing the method used, and the frequency with which changes could be made between the two methods would need to be determined. If the claims event system were to be made mandatory for the property class (and possibly other classes), the need to ensure that the system could be applied and properly controlled by every company might make it hard to obtain a majority view in favour of the change.

The size of an event is not easy to determine soon after it has occurred, and it would therefore appear appropriate for adjustments to the estimates to be encompassed by the rules. This would also be necessary to avoid deliberate tax manipulation. Rules would also be needed to cater for a claims event occurring across a financial year-end.

It is natural to assume that concerns may exist, particularly at the Inland Revenue, that an event system could be open to manipulation. A tightly defined system which cannot be manipulated ensures that equalisation reserve withdrawals are made with little or no scope for the tax payable on withdrawal being avoided by deliberately not making the withdrawal, or deliberately reducing its size.

These practical difficulties certainly contrast with the clean nature of the claims ratio method.

9.3 Can the difficulties be overcome?

To overcome the difficulties, it would appear to be necessary:

1 to establish clearly what constitutes an event;
2 to ensure that the scope of each catastrophic event is clearly defined so that single and several events can be distinguished;
3 to ensure that insurers apply these definitions properly to all claims; and
4 to devise satisfactory rules for choice between the claims event system and claims ratio system, and to deal with the other issues discussed earlier.

How feasible is this?

Reinsurance contracts have operated for years on the basis of definitions that could be said to be difficult to operate. Although the market has operated satisfactorily on this basis, it is true that disputes have arisen. As an example, there were discussions following the 1990 storms as to how many different events occurred. Moreover, the insurer/reinsurer relationship is such that deliberate manipulation of the claims would not usually be in the insurer's long-term interests. This may not be the case in respect of tax avoidance.

Catastrophe events are declared by some bodies, possibly leading to the conclusion that events can be defined satisfactorily for normal business purposes. However, these purposes are often statistical and in this case

disputes are unlikely. The financial effect of catastrophe reserve withdrawals leads to the conclusion that very real difficulty does indeed exist over the definition problem.

It should be borne in mind when considering this issue that the claims ratio system is not immune from manipulation. The claims ratio (excluding expenses), the class split, and the expenses to be included in the claims ratio could all be manipulated to some degree by an unscrupulous company.

It may be possible for a market body to be established to declare the scope for events such as windstorms, floods, freezes etc. This body could be formed for the sole purposes of claims equalisation reserves, and could include a representative from the DTI, Inland Revenue and ABI. The body would need to define precisely the time, location and nature of the event. However, difficulties may arise as to the legal status of this body should disputes arise.

The further practical difficulties discussed in section 9.2 would necessitate considerable work on drawing up regulations, and the nature of the difficulties would not make this straightforward.

It would be possible to make withdrawals from equalisation reserves subject to professional review. This could be by auditors or by means of some form of actuarial statement. Moreover, the Inland Revenue could inspect companies to ensure correct withdrawals are made.

9.4 Alternative proposals - the Exposure Based Claims Event method

Alternative proposals based on claims events were developed by Stavros Christofides during the consultation period. The working party expresses its thanks to him for allowing us to include his work in Appendix C, which includes a full description of this proposed exposure based claims event system.

This method is similar to that originally proposed by the ABI, LIRMA, GAD, DTI and Inland Revenue working group with the following differences. Transfers out are allowed only if the total cost of qualifying event losses aggregate above the sum of the contribution rate and qualifying event limit. This is as opposed to the original proposals which would enable a transfer out to be made if an event were to exceed the qualifying event limit, this being suggested as 4.5% in both cases. The contribution rate was proposed as 3% for property in both cases. However, the maximum equalisation reserve limit would be 30% of net premium as opposed to 15% in the original proposal.

It appears from the charts presented in Appendix C that the method operates effectively, and serves the aims of the original DTI/Inland Revenue Consultation Document well. The rules are simple and easy to operate, subject to the definition of an event. The method will deal with unusual losses as opposed to cyclical effects or other deterioration of the claims ratio. Moreover, it reflects exposure and clearly could be seen as a substitute for reinsurance. It would appear to work equally well for large and small insurers, and reflects the composition of risk at least to some degree.

It should be appreciated that this proposal is presented to show that an effective claims event system could be developed if the definition problem can be overcome. The exact parameters used are not a recommendation of the working party, and in particular the 30% maximum reserve may be considered by some interested parties to be too high.

9.5 Is a claims event system still desirable?

Many companies are believed to have expressed a preference for the claims event system. The claims event system appears to operate well, as shown by the modelling work, so a satisfactory system could be implemented if the difficulties referred to earlier can be overcome. In assessing the claims event system, the additional record-keeping and auditing controls that are likely to be required should be taken into account. Also, it cannot be expected that companies would benefit from additional taxation benefits in the long-term, and if the only purpose of equalisation reserves is the taxation advantage, then some companies may not view the additional administrative burden as worthwhile.

These aspects should be assessed against the benefits that a claims event system would bring. Given that this method would appear to be a more effective alternative to traditional reinsurance than the claims ratio method, it would seem that an event based system is in principle still desirable, and the working party feels considerable effort should be made to promote further consideration of the claims event system. However, the views of all parties with an interest in the matter must be understood and every effort made to accommodate them.

10. EFFECT OF INSURANCE CYCLE VS CATASTROPHES

10.1 How does the system respond to the insurance cycle?

In order to consider the implemented claims ratio method, and how it will respond to the insurance cycle, the working party has developed a model. This supplements the study based on actual company data in section 8.

The model has been based on a cyclical claims ratio which was modelled in the standard way as follows:

$CR(t) = ACR \times (1 + CA \times \sin(2 \times pi \times t/CP + phase))$

where

CR(t) = claims ratio for year t

ACR = average claims ratio

CA = cycle amplitude factor

CP = cycle period

phase sets up the phase of the insurance cycle at the start.

It is assumed that the claims ratio depends solely on the cycle. The class considered is property.

Different combinations of the average claims ratio, amplitude of the claims cycle and length of the claims cycle were considered. These were chosen as follows:

Claims Ratio - Levels of 67.5%, 72.5% and 77.5% were chosen, these being the same and 5% either side of the trigger level for withdrawals from the equalisation reserve. This enables examination of the effect on companies of having an underlying long term claims ratio lower, the same as or higher than the regulations' trigger level.

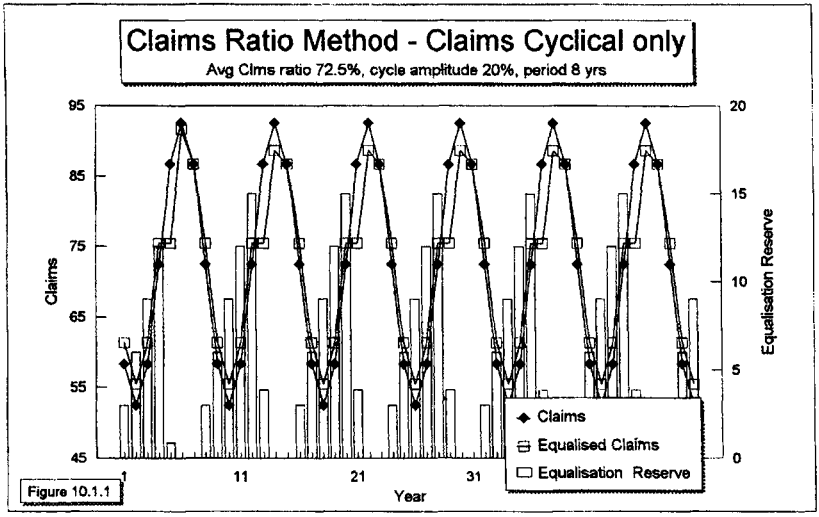
Amplitude of Claims Cycle - The amplitude of the claims cycle either side of the underlying ratio was taken as 15% and 20%. UK industry data from the ABI Insurance Statistics Year Book 1984-1994 shows recent peaks and troughs in property claims ratios of 51.9% in 1988, 86 7% in 1990 and 43.5% in 1994. This gives differences of 35% and 43%, indicating a cycle amplitude of 17% and 22%. Some individual companies' experience is likely to be more extreme, particularly if relatively little reinsurance is purchased. Future cycles may also be more extreme if having equalisation reserves causes less reinsurance to be purchased, or less extreme if cycles are dampened. A cycle amplitude of 25% was also considered but is not presented because the results were very similar to an amplitude of 20%. An amplitude of only 10% was also investigated and appears to make the equalisation reserves work rather better - but the recent evidence does not support a cycle amplitude this low.

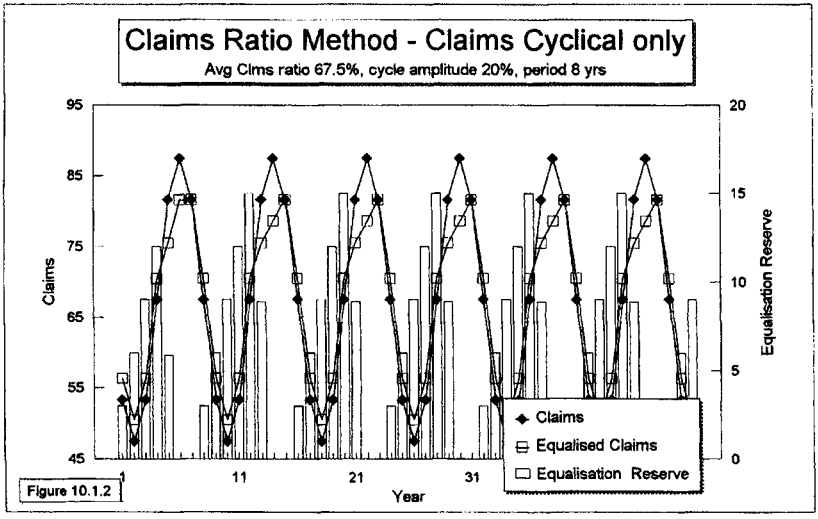
Length of Insurance Cycle - Lengths of the cycle were taken as 6 years and 8 years. The same industry data for property shows the highest level of profit in 1988 and 1994, giving a 6 year length for the cycle. Lowest profitability occurred in 1984 and 1990, again giving a 6 year length. However the profit peak in 1988 was followed only 2 years later by the profit trough in 1990 indicating a shorter cycle period. Traditionally, cycles have been considered to be as long as 10 to 12 years but the recent property experience does not support this. However, a 10 year cycle was also considered.

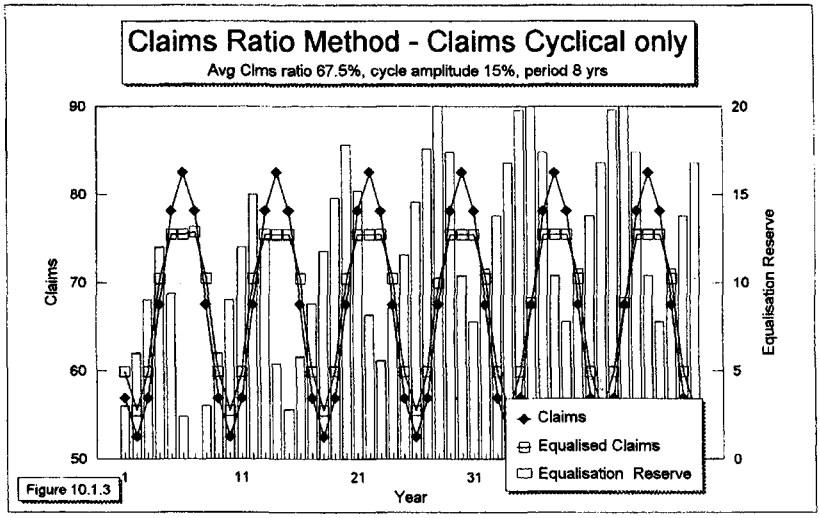
This section includes four charts which highlight some of the most significant effects. The charts display the claims, the equalised claims, and the level of the equalisation reserve, all as a percentage of premiums. The equalised claims are the claims plus transfers in less transfers out. A summary table shows the maximum equalisation reserve which builds up for each scenario together with an indication of how quickly the reserves are exhausted by withdrawals. Further charts have been included in Appendix B.

Observations - Figure 10.1.1 is based on an average claims ratio of 72.5% i.e. the trigger level for withdrawals. For this average claims ratio, regardless of the cycle amplitude and length, the equalisation reserves do not build up to the maximum permissible, and the equalisation reserves are exhausted after one or two years with higher claims ratios. Withdrawal from the reserve is made in the first year in the cycle when the claims ratio is higher than average, with some withdrawal in the following year (except for cycle amplitude 20%, cycle length 6 years - see Appendix B, Figure B.2). The fact that the reserve would be exhausted quickly because of the cyclical effect may be a concern to any company hoping to use the reserve for withdrawals in the event of catastrophe or other unusual events.

Figures 10.1.2 and 10.1.3 are based on an average claims ratio of 67.5%. This lower level gives a greater opportunity for the reserve to build up, and the cycle amplitude becomes the most important factor. An amplitude of 20% still causes the reserve to be exhausted in two years. An amplitude of 15% causes the reserve to build to a maximum and withdrawals are made for three years without exhausting the reserve. In this case, the amount withdrawn in one year is limited in the model by the maximum possible claims ratio of 82.5%.


Claims Ratio Method - Claims Cyclical only
Avg Clms ratio 72.5%, cycle amplitude 20%, period 8 yrs
Claims
Equalisation Reserve
Year
Claims
Equalised Claims
Equalisation Reserve
Figure 10.1.1


Claims Ratio Method - Claims Cyclical only
Avg Clms ratio 67.5%, cycle amplitude 20%, period 8 yrs
Claims
Equalisation Reserve
Year
Claims
Equalised Claims
Equalisation Reserve
Figure 10.1.2


Claims Ratio Method - Claims Cyclical only
Avg Clms ratio 67.5%, cycle amplitude 15%, period 8 yrs
Claims
Equalisation Reserve
Year
Claims
Equalised Claims
Equalisation Reserve
Figure 10.1.3

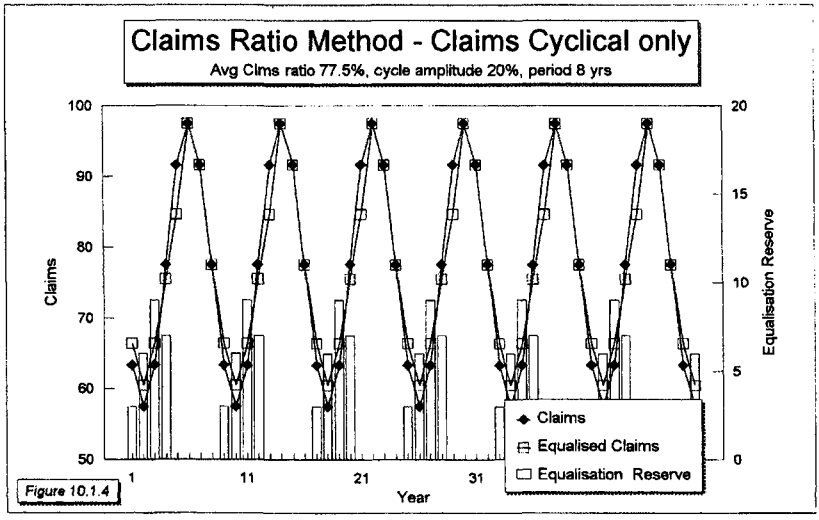

Claims Ratio Method - Claims Cyclical only
Avg Clms ratio 77.5%, cycle amplitude 20%, period 8 yrs
Claims
Equalisation Reserve
Year
Claims
Equalised Claims
Equalisation Reserve
Figure 10.1.4

Figure 10.1.4 is based on an average claims ratio of 77.5%. For all scenarios based on this average claims ratio, the equalisation reserve fails to build up to even half the maximum level. Withdrawals are made and the equalisation reserve exhausted in two years, but this occurs before the final worst year of the cycle, leaving no reserve for the further adverse part of the cycle. For companies with a high underlying claims ratio, it therefore appears that the reserve would not offer much protection against a catastrophe or other unusual event - indeed half the time no reserve will be held at all.

For a longer cycle period of 10 years (see Appendix B, Figure B.9), the equalisation reserve builds to a higher level. The reserve is still exhausted in two years and no reserve available for three years.

For a cycle amplitude of 10% (see Appendix B, Figure B.10), withdrawals are made for three years and the build up and depletion of the reserve appears to operate more satisfactorily - however, a cycle amplitude this low does not seem realistic.

The summary table is as follows:

Claims Ratio %	Cycle Amplitude %	Cycle Length Years	Maximum Equalisation Reserve Built Up As % of Premiums	Is Reserve Exhausted In First Year Of Withdrawals?	Is Reserve Exhausted In Second Year Of Withdrawals?
72.5	20	8	15	Nearly	Yes
72.5	15	8	15	No	Yes
72.5	20	6	12	Yes	Yes
72.5	15	6	12	Nearly	Yes
67.5	20	8	15	No	Yes
67.5	15	8	20	No	No
67.5	20	6	12	Nearly	Yes
67.5	15	6	20	No	No
77.5	20	8	9	No	Yes
77.5	15	8	9	No	Yes
77.5	20	6	6	No	Yes
77.5	15	6	6	No	Yes
72.5	20	10	18	No	Yes
72.5	10	8	15	No	No

In conclusion, the two main effects are the average claims ratio and the combined average claims ratio and cycle amplitude (i.e. the peak claims ratio). It is only when the peak ratio is low that the equalisation reserve is not exhausted within two years. For a company with an underlying claims ratio of 77.5%, the reserve fails to build up to even half its maximum level.

In all cases there is some mitigation of poor years in the cycle, but in most cases there would appear to be weaknesses in how the reserve operates, and it is clear that the insurance cycle will in many cases exhaust the reserve quickly and leave no protection against further losses e.g. from a catastrophe until a

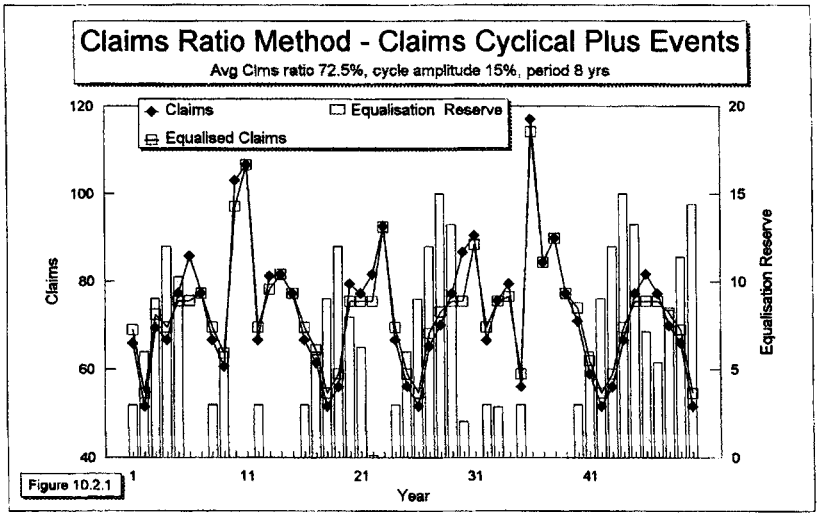
favourable part of the cycle allows the reserve to build up again. This aspect, which must be of concern, is considered further in the next section.

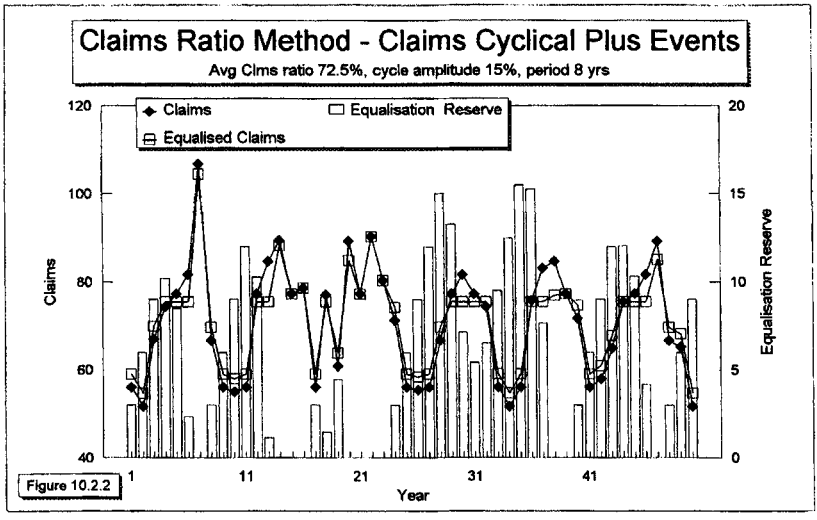
10.2 Combined cycle and event model

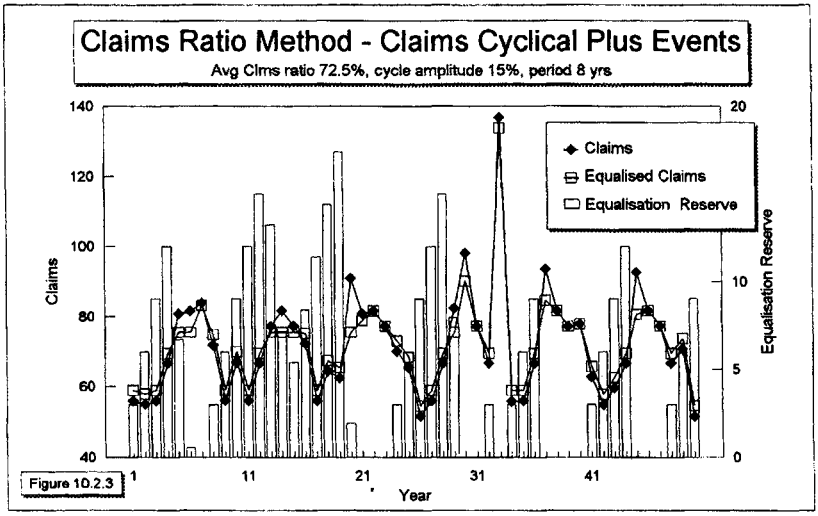
In order to increase the realism of the modelled claims process, unusual claim events were added to cyclical claims, giving a simulated event component. These events were generated using the Poisson and Pareto distributions as described in the exposure based claims event method in section 9.4 and Appendix C.

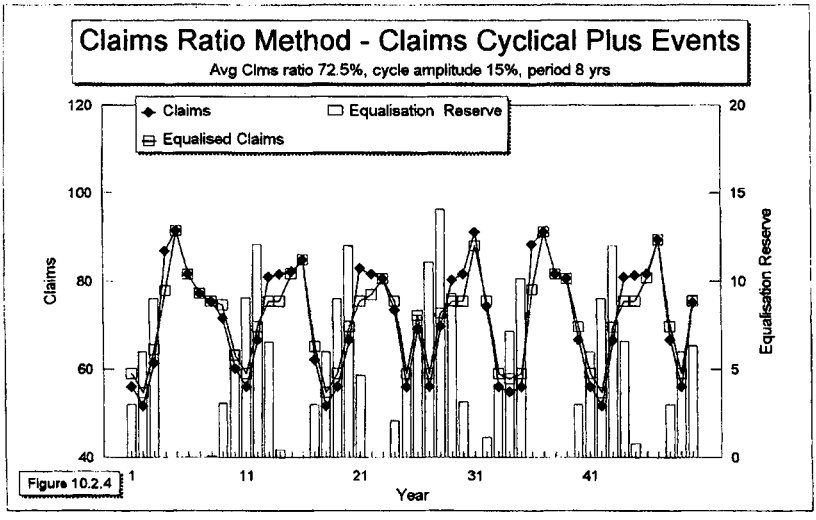
Over a long period, the model assumptions lead to events amounting to 5.9% of premium. The cyclical claims were based on an underlying claims ratio such that the total cyclical claims plus event claims amount, in the long term, to the claims ratio being considered. Thus if a claims ratio of 72.5% is being considered, this is broken down to 66.6% from cyclical claims and 5.9% from event claims.

Figures 10.2.1 to 10.2.4 show four example simulations from this modelling, all based on overall claims at 72.5%, cycle amplitude 15% and cycle period 8 years. The underlying cycle can still be seen, but with the addition of claim events causing the total claims to be more erratic. Examination of the charts shows that the equalisation reserve will respond to the claim events in some, but not all, circumstances. Withdrawals will occur in response to an event when a) there is a reserve available as a result of being in the right phase of the cycle and b) when the combined cycle plus event claims ratio goes over the equalisation reserve withdrawal trigger level. Also, if the cyclical claims


Claims Ratio Method - Claims Cyclical Plus Events
Avg Clms ratio 72.5%, cycle amplitude 15%, period 8 yrs
Claims
Equalisation Reserve
Equalised Claims
120
100
80
60
40
20
15
10
5
0
1
11
21
31
41
Year
Claims
Equalisation Reserve
Figure 10.2.1


Claims Ratio Method - Claims Cyclical Plus Events
Avg Clms ratio 72.5%, cycle amplitude 15%, period 8 yrs
Claims
Equalisation Reserve
Equalised Claims
120
100
80
60
40
20
15
10
5
0
1
11
21
31
41
Year
Claims
Equalisation Reserve
Figure 10.2.2


Claims Ratio Method - Claims Cyclical Plus Events
Avg Clms ratio 72.5%, cycle amplitude 15%, period 8 yrs
Claims
Equalised Claims
Equalisation Reserve
Claims
Equalisation Reserve
Year
Figure 10.2.3


Claims Ratio Method - Claims Cyclical Plus Events
Avg Clms ratio 72.5%, cycle amplitude 15%, period 8 yrs
Claims
Equalisation Reserve
Equalised Claims
Claims
Equalisation Reserve
Year
Figure 10.2.4

cause a withdrawal regardless of the event claims, then there effectively may be no response or a reduced response to the event claims.

The amount of withdrawal in response to the claim events rather than the cycle was quantified as follows. For each year, the amount of withdrawal which would have been made if there had been no claims events was calculated. Then, this was deducted from the actual withdrawal, giving the additional withdrawal which is a response to the claims events. These "event withdrawals" were accumulated and the claims events also accumulated, and the former expressed as a percentage of the latter.

The following table shows the results for property for different overall claims ratios, cycle amplitudes and lengths, derived from one million year simulations.

Claims Ratio %	Cycle Amplitude %	Cycle Length Years	Event Withdrawals as % of Claims from Events
72.5	20	8	10
72.5	15	8	13
72.5	20	6	12
72.5	15	6	15
67.5	20	8	8
67.5	15	8	10
67.5	20	6	9
67.5	15	6	11
77.5	20	8	13
77.5	15	8	18
77.5	20	6	15
77.5	15	6	20
72.5	20	10	35
72.5	10	8	18

10.3 Which is the major effect?

It is evident that the cyclical claims ratio effect is dominant over the large claims effect - thus, it appears that the system will not respond to catastrophes or other unusual claims in many cases when it is desirable that it should, this only happening when the catastrophe occurs at the right time in respect of the insurance cycle. A large amount of the withdrawals which take place occur because of the cycle and the events do not trigger significant further withdrawals.

The original DTI/Inland Revenue Consultation Document indicated that the equalisation reserves scheme should meet volatile losses and not respond to the cycle, but this original objective does not seem to have been met successfully.

11. INFLUENCE ON PURCHASE OF REINSURANCE

11.1 Reinsurance programmes for 1996

The working party is not aware of any material alterations in attitudes towards the purchase of traditional reinsurance protection programmes for 1996. It can be argued that it is too early to observe any change since the accumulation of equalisation reserves had not started prior to 1996. At the same time, an alternative view may be that the form of equalisation reserves, particularly the rules for withdrawing from any accumulated funds, do not correspond with the traditional needs for reinsurance protection, at least at an operating unit level within a company. The current operation of withdrawals from equalisation reserves is more akin to a stop loss policy on particular accounts rather than catastrophe or risk excess of loss reinsurance protection.

Underwriters and managers have, over the years, become accustomed to using catastrophe reinsurance to protect accounts against large catastrophes and risk excess of loss (or surplus lines treaties) to limit the exposure on any single policy. To the extent that equalisation reserves do not provide any easily recognisable substitute for such types of reinsurance, it is not surprising that initially the effect on reinsurance buying has not been pronounced. Moreover, companies should be aware that if their equalisation reserve does respond to a catastrophe and is as a consequence depleted, they may need to re-enter the reinsurance market. This would be likely to occur at a time when reinsurance prices have been increased, possibly significantly, because of the pay-back concept, and when capacity may be scarce. Any re-entry to the market could

therefore be on very disadvantageous terms, and companies should be cautious in the light of this.

A further reason why there may be little or no initial change in reinsurance buying may be found in the way in which underwriters or managers account for their results. To the extent that reinsurance is purchased on a decentralised basis (i.e. each unit makes its own reinsurance arrangements) and accounts for its results on a net basis, unless it is clear that withdrawals from equalisation reserves can be used in the calculation of the technical result, there will be no incentive to change reinsurance buying behaviour.

11.2 Longer term effect

Over the longer term, behavioural patterns are likely to change. As the equalisation reserves become bigger, we would expect to see the following:

- A more fundamental questioning of the reasons for purchasing reinsurance. To the extent that excess of loss reinsurance is used as a method of smoothing results over time, equalisation reserves may be viewed as a substitute even if withdrawals from such reserves are not due to single "large" events.
- Technical result accounting within companies to take account of contributions to and withdrawals from equalisation reserves.

The extent to which companies will be willing to substitute equalisation reserve withdrawals for reinsurance recoveries will also depend on the way in which the market and investment community in general come to treat equalisation reserves. If the size of equalisation reserves comes to be seen as

one of the measures of strength of a company's balance sheet, many companies may be concerned to see the size of their equalisation reserves fall below a certain level. After all, other than for tax relief, the surplus of a company could be used for the same purpose as equalisation reserves. Given the surplus within some UK companies, there are many who would argue that reinsurance buying has been excessive in the past. However, this may have been the result of a desire to have healthy solvency ratios in any single financial year (rather than long term average healthy solvency ratios).

11.3 Role for second loss catastrophe cover

If equalisation reserves had been cast in an "event" based formula, it might have been easier for reinsurers to develop policies to respond to the needs of insurers. In particular, the use of second loss (or more) coverages was fairly common in the early 1990s catastrophe market. Insurers who could be fairly certain that any catastrophe event could be met through equalisation reserves could opt for a second loss coverage at a much reduced premium. With the present system it is difficult to disentangle the effects of the cycle from those of an uncorrelated catastrophe event. Other parts of this paper show that the major effect on equalisation reserve withdrawals is likely to have been at the level of pricing because of overall cyclical movements. The hazard for the insurer would be that a major catastrophe occurs at the bottom of the cycle. Traditional first loss catastrophe reinsurance buying in that situation may be the best solution as the risk of using the withdrawal from equalisation reserves to meet bad technical results from inadequate pricing would be greater. Conversely, considerably reduced reinsurance buying (perhaps in the form of second loss cover) would be a better strategy at the top of the cycle. Clearly there could be adverse financial consequences for reinsurers. This would be

amplified to the extent that the insurance and reinsurance cycles coincide as more reinsurance at a cheaper price would be bought at the bottom of the insurance cycle when the risk would be greater.

11.4 Multi-year covers

An obvious response for reinsurers would be to develop longer term contracts. These would either be traditional contracts over a longer time frame or some type of long term arrangement whereby overall withdrawals from equalisation reserves are also included.

The use of long term arrangements is not new, as the reinsurance cycle has always existed, and longer term arrangements between insurers and reinsurers were already desirable and indeed if not explicitly then tacitly agreed in many instances. What is new is that this type of arrangement, on an explicit basis, could become more common, especially if it does meet the reinsurance needs of insurers in conjunction with the insurer's equalisation reserves. Also, it may be attractive to reinsurers if it avoids the possible adverse financial consequences to reinsurers of changes in traditional reinsurance buying habits discussed earlier in section 11.3.

11.5 New covers

With an ingenious broker community, it is likely that over time we will see the development of new covers. Covers such as an equalisation reserve protection policy or contingent (warranty) policies on overall market loss ratios may be around the corner. Catastrophe options could become more relevant as a complement to equalisation reserves if traditional reinsurance

purchasing is reduced. Whether these types of arrangements will be a challenge or a headache for professionals involved in pricing remains to be seen.

12. EFFECT ON SOLVENCY

12.1 It is assumed in the following that the present regulatory framework remains in force. If changes are introduced, the existence of equalisation reserves might be allowed for more explicitly. The current solvency margin calculations do not recognise the equalisation reserve and therefore, because the reserve counts as an additional liability, the net assets are reduced and the apparent solvency position is worsened. In fact, however, the company is stronger in that additional funds are available to meet adverse results, and these funds are not distributable or available to be treated as free capital which would allow further business to be written.

The working party considers that it is too early to tell how equalisation reserves will affect the assessment of solvency, and therefore some possible different views are set out below for consideration.

12.2 One view of the effect on solvency

As the statutory required minimum margin of solvency will sit on top of the equalisation reserve, the overall strength of the company is effectively increased. Although companies do not run close to the RMM at the moment, they have done so in the past. Therefore both the burden and the benefits of the RMM will be increased. Companies will in effect have to be more solvent.

A possible consequence would be to reduce the overall amount of both reinsurance protection purchased as discussed in section 11, and reinsurance capacity.

The view that the supervisory authorities will take is not yet clear. It might be expected that they will implicitly take into account the strength which exists if a reasonable sized equalisation reserve is held, but this is unlikely to be acknowledged in public very readily.

12.3 A second view of the effect on solvency

If a company has a significant excess of available assets over the RMM, it is hard to see the market - which perhaps is what matters most in this situation - not treating the equalisation reserve (less tax payable on withdrawals) as an addition to the excess assets; knowing this, the company would allow its excess assets to fall until the total amount was whatever it would have been in the absence of the equalisation reserve. The situation is still different in that the company would be closer to a position in which statutory solvency became a consideration than it would have been without an equalisation reserve.

The actual solvency ratios of companies (total assets less total liabilities, divided by written premium) depend on many factors, including the level of the stock market and the state of the insurance cycle. If the insurance market is soft, solvency margins can be higher if companies write less premium income, or if this follows a period of higher profitability. If they are actually reducing the amount of risk accepted, this higher solvency level is correctly reflecting the situation, but if the lower premium income simply reflects lower prices then the stated solvency margin needs to be higher to provide the same

level of security - both because it is expressed as a multiple of premium, and because the probability of ruin increases with less adequate premium rates.

Equalisation reserves may among other things smooth results and thus reduce the volatility of the insurance cycle. If this happens then perhaps average solvency levels will not need to be so high. Less business will be written at inadequate rates, and the total amount of income to the industry would both increase and stabilise. It seems rather doubtful that such a result, devoutly to be wished as it may be to some, would actually ensue!

Overall, the introduction of equalisation reserves should tend to increase the capital security of insurers. It remains to be seen by how much, and it will be difficult to measure the effect if any since the other factors affecting solvency - notably investment conditions and the insurance cycle - generally have a greater effect than equalisation reserves are likely to.

12.4 A third view of the effect on solvency

Equalisation reserves are irrelevant to solvency and should be ignored except in the tax accounts. The legislation uses a formula which produces a number, which is equal to the amount of the taxable profit or loss that one may ignore in the tax calculation. The only effect apart from this is that of different decisions made by management when the company is close to insolvency, and the amount of the equalisation reserve is so low compared with other balance sheet items - notably claims reserves - that the managers of a company in trouble with an equalisation reserve ought to be pretty worried and defensive anyway.

13. EFFECT ON RETURN ON CAPITAL

If the solvency of insurers increases then all other things being equal, returns on capital will fall. However, one should not expect that all other things will in fact remain equal. For example:

- A delay in paying tax would increase the present value of net-of-tax profits and thus the return on capital.
- As suggested in section 12 on solvency, companies which would not be near to the present statutory minimum solvency level might become so. A company in this situation would presumably adapt its investment strategy, moving away from riskier equity-type investments and into short gilts. This should reduce its expected profits after allowing for investment income.
- The required return on capital might fall as well if the solvency strength of companies is increased (less risk of ruin), and also if the stream of profits is smoothed.
- An element of reinsurers' profits should accrue to the direct companies, increasing total UK profits (since some of the reinsurance capacity comes from overseas).
- As a general principle the introduction of a new tranche of regulation should be expected to reduce profitability.

When companies consider return on capital, it is usually intended to allocate capital to the various lines of business they write, with a view to some type of optimising. In the case of equalisation reserves, as transfers in are dependent on premium in certain classes and transfers out on the claims experience again by class, it will be natural for underwriting departments to assert ownership of "their" part of the equalisation

reserve. In particular, if the underwriting ratio worsens it will be desired to claim any release from the equalisation reserve to offset the result.

However, it is not clear that the equalisation reserve should be allocated at all. The allocation of equalisation reserves below the level at which they are calculated would be difficult to accomplish and would involve assumptions as to the appropriate allocations. There is no specific event so no claim can be considered either to have been a part of the trigger for a release or to have been excluded. One would simply need to take a view, and there is no obviously correct basis for doing so, though allocation bases could be devised. For example, would a new tranche of business which had never contributed to the total of, say, the property part of the equalisation reserve in the past get a credit if there was a release?

Allocating even at the level of the original calculation may be questionable if one takes the hard-line view that equalisation reserves are really only tax and profit smoothers. Why smooth individual sub-results? Tax is not paid on different parts of the company separately, and for that matter solvency is not met or failed below company level.

If one considers that equalisation reserves do represent a change in the solvency requirements then it can be argued that writing an extra £1 of premium in the property account will cost the company £0.03 in capital (plus the rest of the usual solvency requirement). When assessing return on capital by line of business then the effect of this additional capital requirement should be taken into account. However, if the total amount of capital available is much more than the equalisation reserve plus the RMM, it might be argued that the equalisation reserve is part of the overall excess capital and not specific to lines of business, and that one would therefore be allocating capital on a fairly arbitrary basis by using the equalisation reserve

percentages. This argument would be supported if it were believed that the solvency of a company should be considered only at the company level.

14. FUTURE DEVELOPMENTS AND ROLE FOR ACTUARIES

The observations in this paper indicate that the equalisation reserves scheme implemented has some shortcomings which will mean that the operation of the scheme will be unsatisfactory for some companies. Further development of the equalisation reserves regulations is therefore desirable. Indeed, there is already an acknowledgement of the possibility of amending the regulations in due course to incorporate a claims event system if the objections to this method can be overcome.

In this paper it is demonstrated that a claims event system could be developed which would respond to abnormal events better than the claims ratio system. If the event definition problem and other practical difficulties can be resolved, further efforts should be made to refine the parameters for the operation of an event system. Actuaries would be ideally placed to conduct this work.

Regardless of whether a suitable event system can be achieved, the operation of the claims ratio system should also be reviewed and developed, with the objective of mitigating the shortcomings identified in this paper. Among various areas worthy of further consideration are:

- Whether the claims ratio used for the trigger level should be determined on a company basis, e.g. by averaging the company's own experience over recent years.
- Whether the variability of the company's results should be taken into account.
- Whether a higher contribution rate should be allowed when the equalisation reserve is below a certain level in order to enable a more rapid build-up of the fund.

- In order to reduce withdrawals in response to the cycle, whether withdrawals should be reduced or disallowed in years where no abnormal loss has occurred.

Actuaries have a significant role to play in the study of proposed methods and the calibration of parameters, as well as in developing the understanding of the financial dynamics of general insurance companies. Equalisation reserves affect solvency, capital requirements, financial strength and reinsurance arrangements - all areas where actuaries can make a significant contribution. Actuaries should therefore ensure that they understand the effects of equalisation reserves and, most importantly, communicate their understanding to the senior management of insurance companies.

15. CONCLUSION

Although the findings in this paper show some shortcomings in the operation of equalisation reserves as implemented by the Insurance Companies (Reserves) Regulations 1996, the introduction of these reserves with the benefit of tax relief is still a most welcome development for the United Kingdom insurance industry. It is important to remember that development of the scheme involved different parties with very different responsibilities, and compromise over some issues was appropriate to enable the scheme to get off the ground. A straightforward and simplified scheme was necessary in order to proceed. It should also be remembered that no perfect scheme exists - any equalisation reserves scheme will have some inadequacies, and suit some companies better than others.

This paper shows that, after an initial period to see how the rules will operate in practice, further development of the scheme is likely to be worthwhile in order to attempt to meet the interests of the insurance industry, regulators and tax authorities as appropriately as possible.

Companies should consider the effect of equalisation reserves on their balance sheets and on their reinsurance requirements. Any changes to reinsurance arrangements must be made with the full understanding of the implications if equalisation reserves are exhausted. Less conventional forms of reinsurance may as a result become more relevant.

The competitive position of the United Kingdom insurance industry compared to many overseas insurers has in the past been adversely affected by the lack of tax relief on transfers to equalisation reserves. This has now been addressed, and other potential benefits should also be achieved, especially if the rules can be developed in the longer term to improve the scheme's operation.

Appendix A - Calculation of Equalisation Reserve (Company A)

PRO FORMA SCHEDULE TO CALCULATE EQUALISATION RESERVE

Summary of movements on equalisation fund

	£000													
	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
Fund brought forward	0	3,795	7,780	12,070	16,835	22,978	31,138	40,886	51,593	62,583	4,034	0	16,542	33,907
Transfers in	3,795	3,985	4,290	4,765	6,143	8,160	9,748	10,708	12,179	12,471	12,963	16,542	17,365	15,640
Transfers out	0	0	0	0	0	0	0	0	0	(71,019)	(66,745)	0	0	0
Subtotal	3,795	7,780	12,070	16,835	22,978	31,138	40,886	51,593	63,772	4,034	(49,728)	16,542	33,907	49,546
Add back of transfers out over and above available fund	0	0	0	0	0	0	0	0	0	0	49,728	0	0	0
Subtotal	3,795	7,780	12,070	16,835	22,978	31,138	40,886	51,593	63,772	4,034	0	16,542	33,907	49,546
Reserve ceiling	25,302	25,933	26,821	28,058	30,637	36,457	44,141	52,698	62,583	71,019	77,451	86,510	95,386	100,000
Fund carried forward	3,795	7,780	12,070	16,835	22,978	31,138	40,886	51,593	62,583	4,034	0	16,542	33,907	49,546

PRO FORMA SCHEDULE TO CALCULATE EQUALISATION RESERVE

Schedule to calculate abnormal loss

	£000													
	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
Premiums earned	119,398	129,140	137,556	150,923	183,545	239,138	293,254	336,328	383,391	408,839	419,195	485,176	578,676	549,390
Claims incurred in year	68,308	84,804	86,842	106,483	127,818	162,940	192,092	167,528	209,369	378,540	370,662	342,777	241,856	187,698
Claims ratio	57.2%	65.7%	63.1%	70.6%	69.6%	68.1%	65.5%	49.8%	54.6%	92.6%	88.4%	70.7%	41.8%	34.2%
Trigger ratio for class	72.5%	72.5%	72.5%	72.5%	72.5%	72.5%	72.5%	72.5%	72.5%	72.5%	72.5%	72.5%	72.5%	72.5%
Trigger claims value	86,564	93,626	99,728	109,419	133,070	173,375	212,609	243,838	277,958	296,409	303,916	351,752	419,540	398,307
Abnormal loss	0	0	0	0	0	0	0	0	0	82,131	66,745	0	0	0

PRO FORMA SCHEDULE TO CALCULATE EQUALISATION RESERVE

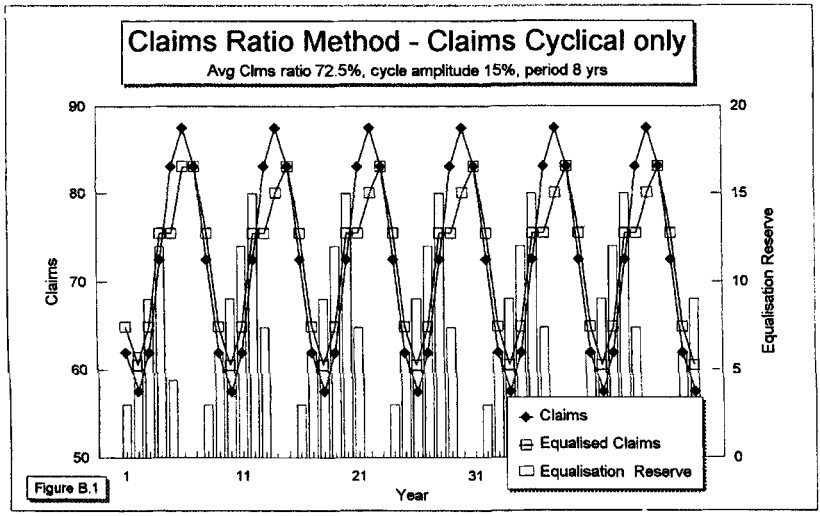
Schedule to calculate transfer in and maximum permitted fund

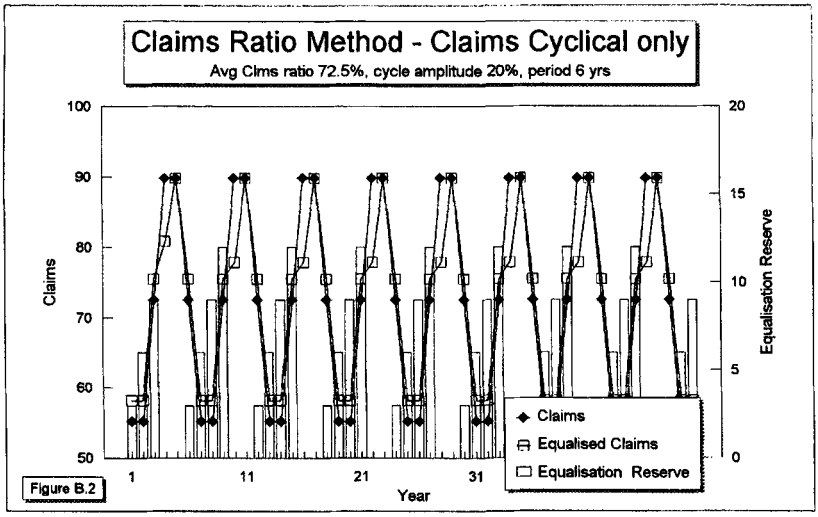
5 year history of written premium net of reinsurance.

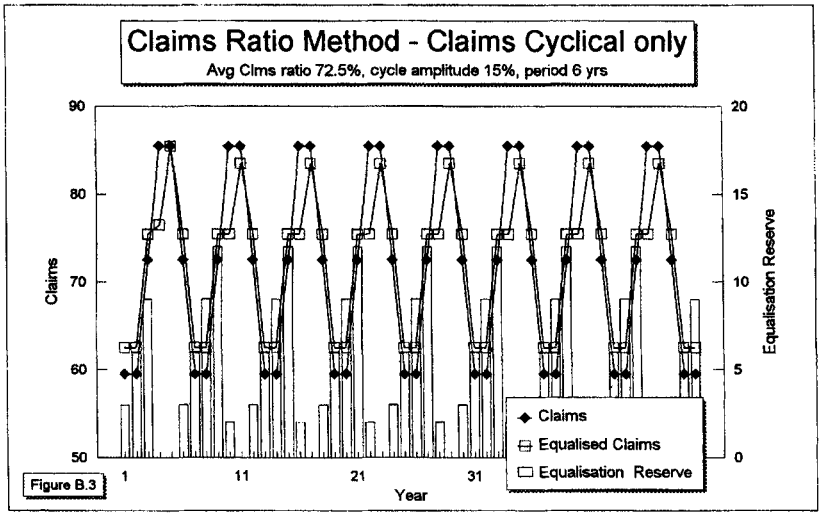
	£000													
	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
Fourth previous year					126,508	132,822	142,990	158,839	204,775	271,989	324,928	356,924	405,951	415,693
Third previous year				126,508	132,822	142,990	158,839	204,775	271,989	324,928	356,924	405,951	415,693	432,772
Second previous year			126,508	132,822	142,990	158,839	204,775	271,989	324,928	356,924	405,951	415,693	432,772	551,401
Previous year		126,508	132,822	142,990	158,839	204,775	271,989	324,928	356,924	405,951	415,693	432,772	551,401	578,820
Current year	126,508	132,822	142,990	158,839	204,775	271,989	324,928	356,924	405,951	415,693	432,772	551,401	578,820	521,323
Total	126,508	259,330	402,320	561,160	765,934	911,415	1,103,521	1,317,455	1,564,567	1,775,486	1,936,269	2,162,742	2,384,638	2,500,009
Average	126,508	129,665	134,107	140,290	153,187	182,283	220,704	263,491	312,913	355,097	387,254	432,548	476,928	500,002
Reserve limit	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%
Reserve ceiling	25,302	25,933	26,821	28,058	30,637	36,457	44,141	52,698	62,583	71,019	77,451	86,510	95,386	100,000
Percentages for transfer in	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Transfer in	3,795	3,985	4,290	4,765	6,143	8,160	9,748	10,708	12,179	12,471	12,983	16,542	17,365	15,640

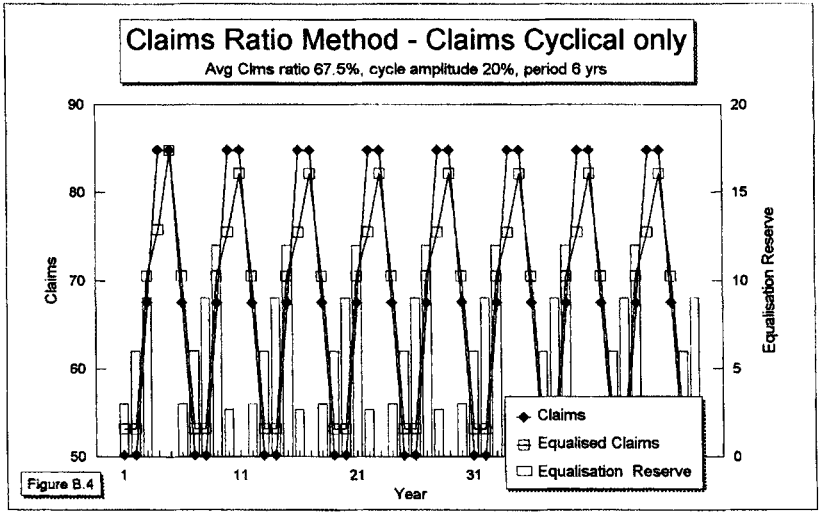
APPENDIX B - Modelling of Claims Ratio Method - Cycle Only

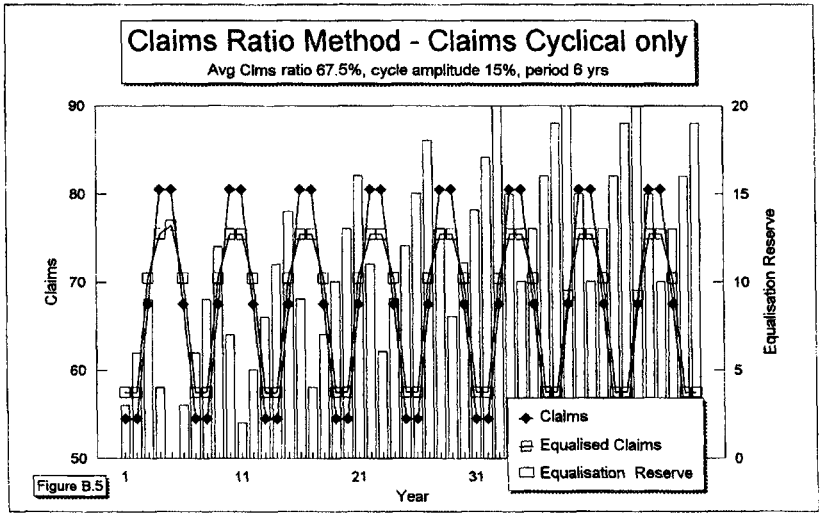
These charts supplement those presented in section 10.1, where details of the model and observations on the results are given. No claim events are included in this model, which is based on an insurance cycle only.

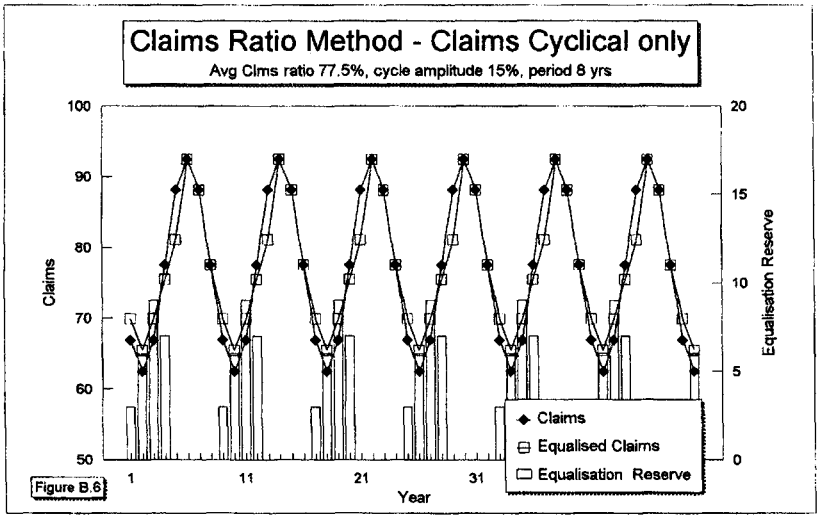


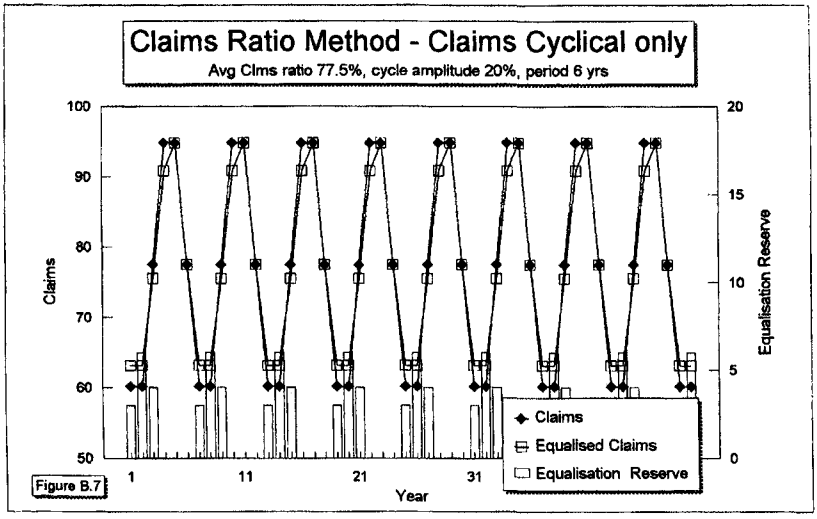


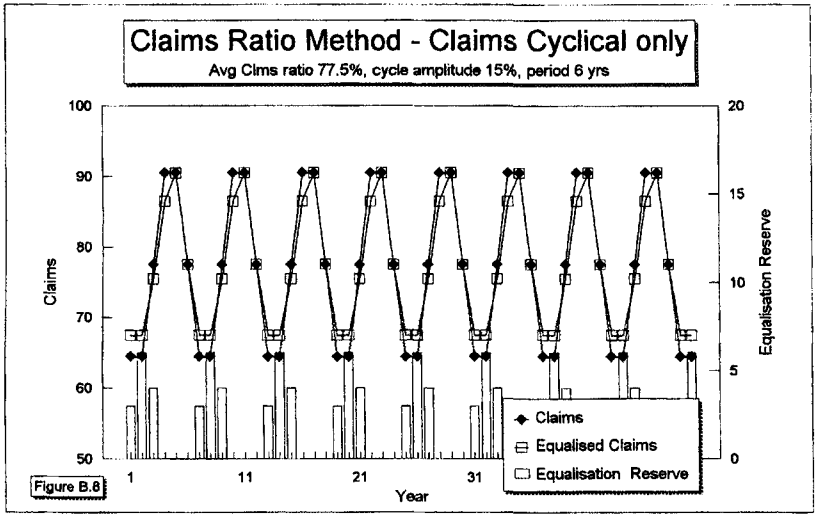

Claims Ratio Method - Claims Cyclical only
Avg Clms ratio 72.5%, cycle amplitude 15%, period 6 yrs
Claims
Equalisation Reserve
Year
Claims
Equalised Claims
Equalisation Reserve
Figure B.3

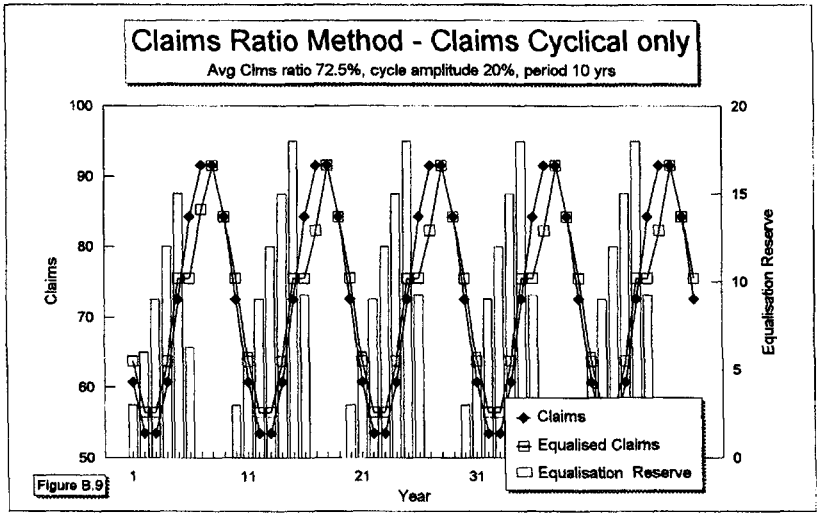

Claims Ratio Method - Claims Cyclical only
Avg Clms ratio 67.5%, cycle amplitude 20%, period 6 yrs
Claims
Equalisation Reserve
Year
Claims
Equalised Claims
Equalisation Reserve
Figure B.4

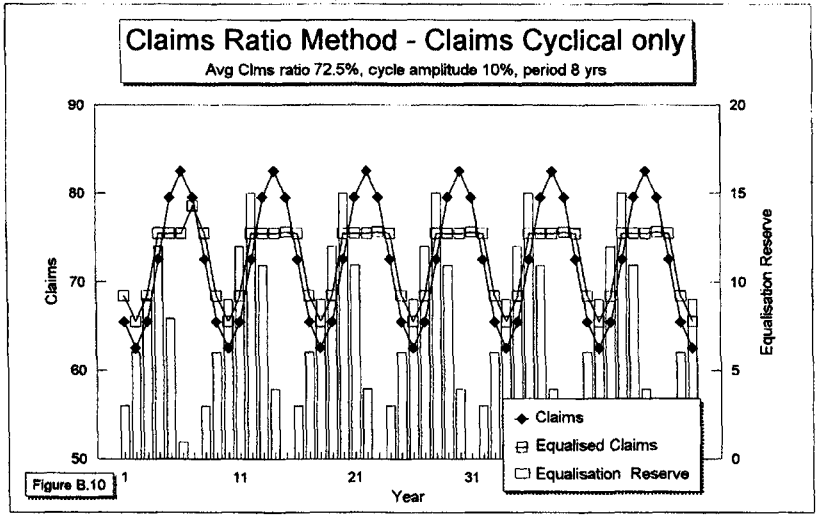

Claims Ratio Method - Claims Cyclical only
Avg Clms ratio 67.5%, cycle amplitude 15%, period 6 yrs
Claims
Equalisation Reserve
Year
Claims
Equalised Claims
Equalisation Reserve
Figure B.5


Claims Ratio Method - Claims Cyclical only
Avg Clms ratio 77.5%, cycle amplitude 15%, period 8 yrs
Claims
Equalisation Reserve
Year
Claims
Equalised Claims
Equalisation Reserve
Figure B.6


Claims Ratio Method - Claims Cyclical only
Avg Clms ratio 77.5%, cycle amplitude 20%, period 6 yrs
Claims
Equalisation Reserve
Year
Claims
Equalised Claims
Equalisation Reserve
Figure B.7


Claims Ratio Method - Claims Cyclical only
Avg Clms ratio 77.5%, cycle amplitude 15%, period 6 yrs
Claims
Equalisation Reserve
Year
Claims
Equalised Claims
Equalisation Reserve
Figure B.8


Claims Ratio Method - Claims Cyclical only
Avg Clms ratio 72.5%, cycle amplitude 20%, period 10 yrs
Claims
Equalisation Reserve
Year
Claims
Equalised Claims
Equalisation Reserve
Figure B.9


Claims Ratio Method - Claims Cyclical only
Avg Clms ratio 72.5%, cycle amplitude 10%, period 8 yrs
Claims
Equalisation Reserve
Year
Claims
Equalised Claims
Equalisation Reserve
Figure B.10

APPENDIX C

Exposure Based Claims Event Proposals

This appendix is taken directly from the work undertaken by Stavros Christofides.

The parameters in this proposal have been developed for the property class. The approach could however be adapted for other classes where similar claim event characteristics occur.

The basis is designed to equalise or smooth the effect of infrequent but large claims including weather related events, explosions and other very large losses. It is therefore very specific in application, as it smoothes only the effect of identified qualifying event losses, and does not smooth the underwriting cycle.

The basis is similar to an excess of loss reinsurance and will complement existing reinsurance, initially at the lower levels. As the equalisation reserve builds up it will be a direct replacement for the lower layers of such reinsurance.

The basis requires three parameters for each class that it will apply to. These are:

1 The Contribution Rate (CR) expressed as a percentage of net premium.
2 The Qualifying Event (QE) size expressed as a percentage of net premium.
3 The Maximum Equalisation Reserve Limit (ML) expressed as a percentage of net premium.

The rules are fairly simple.

1 Transfers into the equalisation reserve occur in a year if the total cost of qualifying event losses aggregate below the sum of (CR + QE) as a percentage of the year's net premium.

2 Transfers out of the equalisation reserve occur in a year if the total cost of qualifying event losses aggregate above the sum of (CR + QE) as a percentage of the year's net premium.

3 Transfers in and out of the equalisation reserve are subject to the amount available in the equalisation reserve and the maximum limit specified.

4 The maximum transfer in is the contribution rate (CR) and this occurs in years when no qualifying event occurs. The transfer in reduces £ for £ for an event costing below the "Equalised Level" of (CR + QE).

5 For qualifying events costing, in aggregate, above the "Equalised Level" of (CR + QE), the transfer out of the equalisation reserve is the aggregate cost of these events less the "Equalised Level" of (CR + QE), subject to the amount available in the equalisation reserve.

An example, based on the property class, is given below with a realistic set of parameters to help in understanding the basis and the rules.

Example - Property Class

1	Contribution Rate (CR)	3% of net premium
2	Qualifying Event Limit (QE)	4.5% of net premium
3	Maximum Equalisation Reserve Limit (ML)	30% of net premium

For illustration purposes let us assume that the net premium for the year is £200m.

The maximum transfer into the equalisation reserve in this instance will be £6m, that is 3% of the £200m premium, and could be accrued as the premium is earned.

Qualifying events must exceed £9m, that is 4.5% of £200m. However, for transfers out of the equalisation reserve, the aggregate cost of the qualifying losses must exceed £15m ((3%+4.5%) of £200m). In such an instance the transfer out of the equalisation reserve is this aggregate cost less the £15m subject to the amount available in the reserve.

In the case of an event between the qualifying limit of £9m and the equalised level of £15m the transfer in to the equalisation reserve reduces £ for £ by the excess cost above the £9m. So for instance in a year when an event costing £13m occurs, the transfer in to the reserve is reduced by the £4m to £2m.

The following table shows the transfers in (+) and out (-) of the equalisation reserve and the equalised cost (cost of qualifying event losses plus the transfer in or out of the equalisation reserve) against the cost of the qualifying losses. Amounts are expressed as a percentage of the annual net premium.

Cost	Transfers in(+) / out(-) of reserve	Equalised Cost
0	3	3
2.5	3	0.5
5	2.5	7.5
7.5	0	7.5
10	-2.5	7.5
12.5	-5	7.5
15	-7.5	7.5
20	-12.5	7.5
25	-17.5	7.5
30	-22.5	7.5

The following section outlines the background to the choice of parameters and indicates how these could be selected for other suitable qualifying classes.

Calibration And Validation Of The Property Class "Claims Event" Method Parameters

1. Calibration

The choice of parameters has been based roughly on the costs of Cat 1990A which was assumed to equate to around 30% of the property premiums for 1990.

This 30% cost is clearly dependent on the mix of property business and an insurer specialising in household buildings insurance is likely to have experienced a loss of around twice this average. It is unrealistic, however, to expect any equalisation

reserve to cope fully with such extremes of exposure as it is assumed that these should be covered by reinsurance or capital strength.

The Contribution Rate is selected to be 10% of the limit. In effect the equalisation reserve will build up to the maximum limit in around 12 to 14 years assuming a premium growth rate of say 3% to 5% per annum. The Qualifying Loss figure was selected to be 50% above the Contribution Rate.

The rationale for this set of parameters was the estimated experience of the property class over the period 1982 to 1991 which is given below.

YEAR	EVENT DESCRIPTION	ESTIMATED COST AS % OF PREMIUM
1982	January Winter Weather	5%
1984	January Winter Weather	3.5%
1987	January Severe Weather	6.5%
	October Storm (87J)	24%
1990	January Storm (90A)	26%
	February Storm	5.5%
1991	February Frost/Freeze	2.0%

On the above, very rough and ready, figures we see that during this ten year period there were 7 events worth measuring and that the annualised cost of these events was roughly 7% of premiums. This average figure provides a benchmark for the "Equalised Cost" which is proposed to be 7.5% for property. It is believed that ABI has compiled some statistics on some of these event losses and it should be possible to relate these costs to the property premiums to ensure that the figures above are representative.

It should also be noted that it would be unrealistic to expect an equalisation reserve to be so high that it can respond fully to two very large events such as 87J and 90A so close together.

2. Validation

An amount of testing of these proposals is necessary to ensure that they will work in practice and that their operation will have the desired effect in smoothing the volatility arising out of infrequent events of abnormally high cost.

One way is to attempt a "what if' type of calculation as undertaken during the consultation process, based on the last ten or so years for which DTI type information exists in extractable format. This is necessary but not sufficient however. Some of the events we are trying to smooth will have return periods which are longer than this relatively short time span and these have to be allowed to occur. Equally such events, although rare, can occur in clusters as we observed with UK storms between late 1987 and early 1990.

In order to consider the likely operation of this form of equalisation reserve ***prospectively*** we need a more appropriate model of the "event" occurrence and cost process. This has been based on a variant of the UK Storm Loss Model developed by the Institute of Actuaries Working Party on "Storm Rating in the Nineties", presented at the 1992 General Insurance Convention.

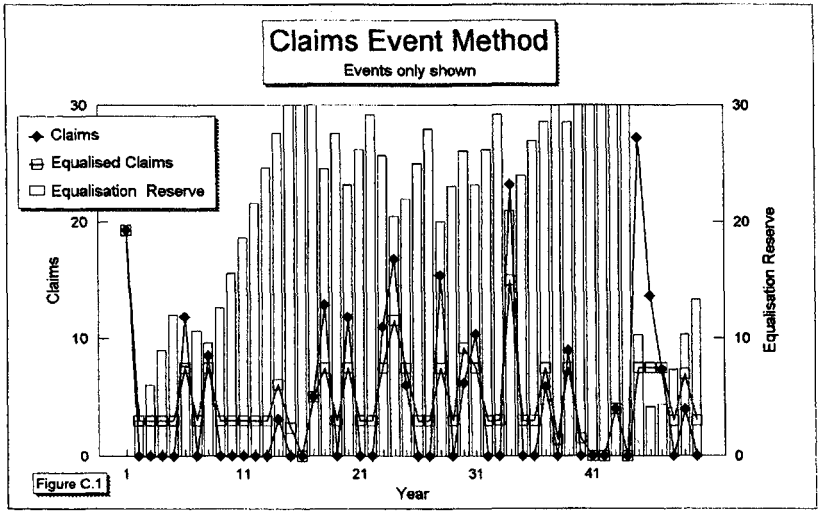
The property abnormal "event" model assumes a frequency of big events in excess of 3% of Premium of 66.7%, this is two in every three years, or roughly seven every ten years. The Poisson distribution is the obvious choice for generating the number of such events in each year.

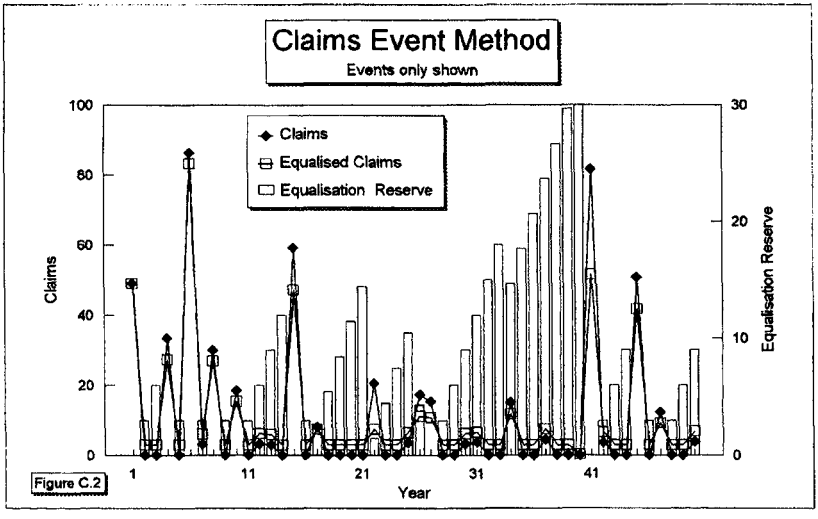
The cost of each of these "events" is then assumed to be a truncated Pareto distribution with a scale parameter of 3% of premium and a shape parameter of 1.26 (as was derived for UK storms). Truncation is at 100% of premium.

Simulation is then used to see how the equalisation reserve as proposed behaves under these assumptions and plotted on charts - see Figures C.1 to C.4 for sample simulations.

It suffices to say here that under these assumptions a 1990A size event has a return period of around 30 years, which seems reasonable. Qualifying events occur roughly every 2.5 years and losses large enough to warrant transfers out of the equalisation reserve occur roughly every 5 years.

Further testing and calibration of the model may be necessary if this method were to be implemented, but it is evident that the framework for a suitable system exists.


Claims Event Method
Events only shown
Claims
Equalised Claims
Equalisation Reserve
Claims
Equalisation Reserve
Year
Figure C.1


Claims Event Method
Events only shown
Claims
Equalised Claims
Equalisation Reserve
Claims
Equalisation Reserve
Year
Figure C.2

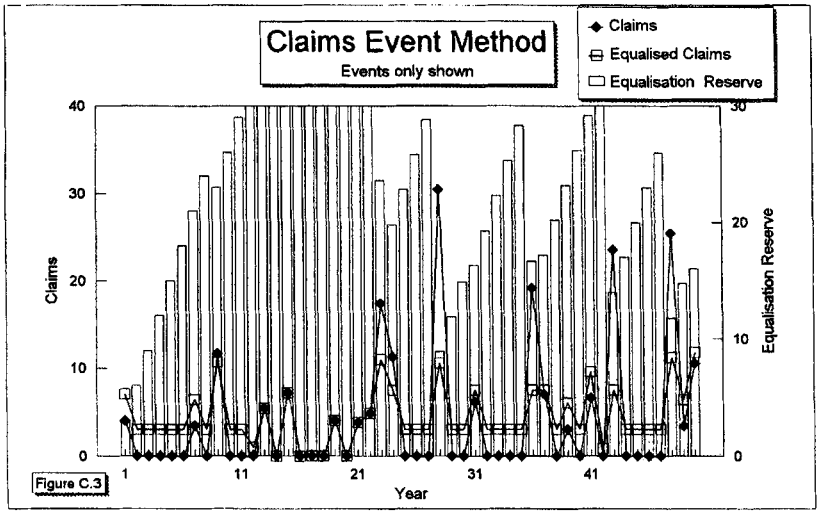


Figure C.3

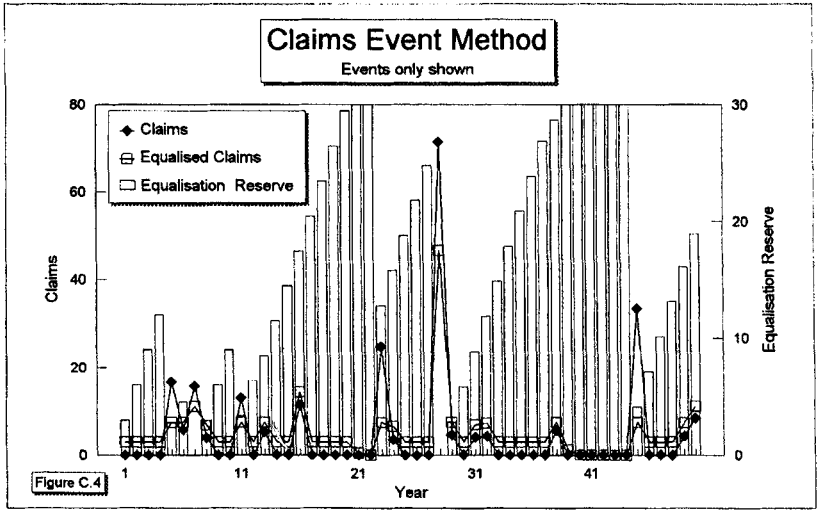


Figure C.4