

# INSTITUTE OF ACTUARIES

## THE APPLICATION OF ACTUARIAL PRINCIPLES TO THE TRANSACTION OF OVERSEAS LIFE BUSINESS

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### INTRODUCTION

THE last paper submitted to the Institute on the special problems arising from the transaction of overseas life business was that submitted by W. F. Gardner in 1935 (*J.I.A.* 66, 198). The expansion since that date in overseas life business justifies a further review of these problems. In 1935 the revenue premium income (other than annuity purchase money) from the overseas business of British life offices as recorded in the Board of Trade Returns was some £6.4 million, representing 7.9% of the total ordinary branch premium income of British life offices; in 1954 the premium income from overseas business was £34.4 million and represented 12.3% of the total.

1.2. The fundamental principles which should be followed in transacting life assurance business are the same whether the business is written in the United Kingdom or overseas, and they do not change with the passing years. However, the conditions under which business is transacted overseas give rise to special problems, and a flexible outlook is necessary in applying these principles appropriately as the business develops and as the local background against which it is written alters.

1.3. The object of this paper is to discuss the principles on which ordinary branch business should be transacted at the present time by a British office through well-established branches in overseas territories where conditions for transacting life business are propitious, and to examine some of the practical problems which arise in applying these principles. Before discussing these principles it will, I think, be helpful if I outline the background against which the business must be transacted.

### THE BACKGROUND

2.1. Overseas life business must be transacted against the background of legislation both overseas and in the United Kingdom. An informative paper on overseas life assurance legislation was presented to the Students' Society by J. E. Finch (*J.S.S.* 12, 193). I will limit myself here to a brief summary of the more important aspects of legislation which have a material influence on the practice of offices transacting overseas life business.

2.2. Legislation in an overseas territory may place some restriction on certain of the assets of the office. The amount of the assets controlled may be limited to a deposit of a fixed amount or it may be equal to a proportion or

the whole of the liabilities in the territory. One or more of the following types of restriction may be imposed:

(a) Restriction on the location of the controlled assets. A requirement may exist that such assets must be physically held in the territory either on deposit with the Government or in the hands of local trustees.

(b) Restrictions on the nature of the controlled assets. It may be prescribed that such assets must be held in specified proportions in stated types of security.

(c) Restrictions on the availability of the controlled assets. Legislation may establish for local policyholders a prior claim on such assets as security for their policies.

2.3. The underlying objective of legislation of this type is to ensure an adequate degree of security for the local policyholders. It is important, however, to note that, in seeking to fulfil this objective, legislation usually concerns itself largely with those assets of the office required to cover local liabilities and concerns itself less with the standard of financial strength of the office as a whole.

2.4. Exchange control provisions exist in certain territories under which funds may not be remitted from the territory except in so far as they represent valuation surpluses after providing for bonuses.

2.5. A wide variety of bases may be employed for the taxation of overseas life assurance business. Tax may be dependent on

(1) premium income, as in Canada.

(2) interest income. The excess of interest income over a prescribed level may be taxed as in Australia or tax may be payable on interest reduced by expenses as in various other Commonwealth territories.

(3) surplus. The whole of the distributed surplus may be taxed, as in New Zealand, or a part of the surplus distributed to policyholders may be relieved of tax, or tax may be charged only on the surplus distributed to shareholders, as in South Africa.

(4) a dual basis under which tax is charged on whichever of two bases produces the greater assessable income. In Pakistan, for example, the dual basis is interest less expenses or surplus less 50% of surplus distributed to policyholders.

2.6. Legislation may prescribe minimum valuation bases for actuarial valuations or maximum valuation bases for assets or the valuation bases for both liabilities and assets may be controlled.

2.7. The terms on which overseas life business can be transacted are affected very little by United Kingdom legislation. As regards income tax the arrangements under which Foreign Life Fund Relief can be secured are on the whole helpful and ensure that the transaction of overseas life business does not normally involve the office in an increase in the United Kingdom tax payable in so far as such tax is properly chargeable to policyholders.

2.8. The overseas life business of British offices must be transacted in local markets in competition with well-established local offices whose premiums and bonuses are, in most cases, determined solely by their local experience.

## GENERAL PRINCIPLES

3.1. The essential aim in transacting overseas life business is to find a sound basis of operation intermediate between the conception of regarding all life business written by the Company as one homogeneous whole and the conception of regarding the business of each branch as an independent unit. No general solution to this problem is possible, and it is necessary to view various aspects separately.

*Guarantee of policies*

3.2. Overseas life policies must carry the guarantee of the office as a whole, and it would not be satisfactory to issue such policies in the name of the office without such a guarantee. This gives rise to an important point of principle even though the existence of a substantial proportion of with-profit business in each territory renders it unlikely, other than in most exceptional circumstances, that it will be necessary to implement this guarantee in any overseas branch from a source external to that branch. Legislation in various territories, however, seems little concerned with this point and, by seeking to protect local policyholders by controlling certain specified assets, imposes some restraint on the availability of such assets to meet the obligations of the office under policies issued in other territories. It is a matter for consideration whether in any particular territory the extent of the restraint imposed is such that it would be inappropriate for an office to transact life business there.

*Assets*

3.3. Having regard to the fact that the assets of the office should, so far as is practicable, be available equally as security for policies issued by the office in all territories it is necessary to consider whether all the assets of the office held in respect of its ordinary life business should be pooled and the same rate of interest credited to the business of the office in each territory, or whether appropriate assets should be notionally ear-marked to the office's business in each territory and the interest on those assets credited to the business accordingly. The ear-marking of assets to the business in each territory is considered preferable for the following reasons:

(a) An essential principle of sound conduct in transacting business in foreign currencies is that assets should be matched to liabilities in each currency. It is reasonable that the yield obtainable from the investments in each currency should be credited to the business in that currency.

(b) Legislation in certain territories controls the nature of the assets corresponding to the liabilities under business written in the territory. As a result of such legislation an office may, for example, be obliged to hold more of its funds in the government securities of a given territory than it would choose to hold from considerations of investment policy. These legislative provisions are designed for the security of policyholders in the territory, and it seems reasonable that, if measures to improve the security of policyholders in a particular territory result in reduced interest income for the office, the consequences should be borne by the policyholders in that territory.

(c) The terms offered by the office will be better aligned to the local market if the interest income credited to its business in each territory reflects its local experience.

*Premium bases*

3.4. If it is accepted that the interest credited to the business in each territory should be that arising from the assets corresponding to that business, one consequence is that it is inappropriate to use the same rate of interest for premium bases in all territories. The rate of interest is an important element in the premium basis, and the different interest yields in the various territories coupled with the different taxation bases, which have a considerable effect on premium rates, mean that the conception of uniform premium bases must be abandoned. There is, therefore, little object in using the same rates of mortality and expenses in premium bases in different territories, even though the differences in experience in those territories, so far as mortality and expenses are concerned, might not of themselves be so large as to justify different bases. The conclusion is, therefore, that all elements of the premium basis should be determined separately for each territory in the light of the expected experience in that territory, and this conclusion is supported by the consideration that this course enables the office most effectively to meet competition in each of the local markets.

*Bonus rates*

3.5. In what follows it is assumed that the office uses a reversionary bonus system both in the United Kingdom and overseas. It is necessary to decide whether, as a long-term policy, bonuses shall be uniform in all territories or whether different bonus rates shall be declared reflecting the experience in each territory. A decision should be made on this question at an early stage in the development of the business since, if it is desired to retain freedom to declare different bonuses in different territories in due course, it is important that steps should be taken to ensure that the declaration of a uniform rate of bonus for the time being does not imply an undertaking to policyholders that this practice will be continued indefinitely.

3.6. It is recognized that the uniform reversionary bonus system achieves no more than broad equity between policyholders and, especially if it is accepted that premium bases should reflect the expected experience in each territory, it might be thought that, within the band of tolerance normally accepted with this system, it would be satisfactory permanently to declare a uniform rate of bonus in all territories. There is much to be said for the principle that all participating policies issued by an office should share equally in its profits, and the conception of a uniform bonus is not one to be lightly discarded.

3.7. There are, however, the following major objections to declaring a uniform bonus in all territories:

(a) The normally accepted practice when a reversionary bonus system is employed, is that the general level of with-profit premium rates is rarely changed unless a new bonus series is started, differences in experience being reflected by variations in the bonus rate declared from time to time. Clearly this principle cannot be applied in each territory if a uniform rate of bonus is declared unless variations in experience in each territory correspond in time and extent. Interest rates, which are an important factor in bonus earnings, do not, however, change in sympathy in various territories, and changes may

be made in taxation bases and rates which are quite unpredictable. If it is desired to declare a uniform bonus, the reversionary bonus system will probably be operated in the usual manner as regards United Kingdom business by reflecting changing conditions by varying bonuses and not the level of premiums; an attempt will, therefore, have to be made to vary the premium rates for overseas business in order to ensure that bonus earnings from these premiums will be broadly the same as the expected earnings from United Kingdom business. Such an attempt, involving as it does estimating future bonus earnings in the United Kingdom, as well as future experience in overseas territories, is not likely to achieve reasonable equity between policyholders in different territories. Moreover, because of the changes which will be necessary in overseas premium rates from time to time, it will not achieve equity between different generations of policyholders in each of the overseas territories. Even though the declaration of a uniform bonus in all territories might be reasonably equitable during a period when conditions were stable, the differential impact of a war, a major economic crisis, or a major tax change might give rise to intolerable inequity.

(b) The practice of the local market in each of the overseas territories is to reflect variations in experience by variations in bonuses rather than in premiums. Moreover, the bonus rates declared in the United Kingdom may be of an inappropriate level for an overseas market; it is, for example, difficult to sell participating policies which carry a high rate of bonus in a market where low bonuses are traditional if the premium bases reflect local experience. Further, where tax is dependent on distributed surplus it is not in the policyholders' interests that bonuses should be at a high level.

3.8. It is, therefore, considered that the disadvantages of a uniform bonus system in all territories are so material as to make it unworkable in the long run. It is, therefore, preferable to declare in each territory bonuses which reflect local experience while charging such premiums as will allow the level of bonuses in each territory to find a suitable level in relation to the local market.

3.9. In the early stages of the development of overseas business the valuation surpluses in each territory are not sufficiently stable to be a satisfactory guide to the bonuses to be declared, and surpluses are distorted by the establishment costs which are incurred. An appropriate course during this development stage is to declare bonuses determined largely by the bonus-earning capacity of the premiums in the local conditions of the various territories. It may be convenient in the initial stages to calculate premiums so that their bonus-earning capacity in each territory approximates to that of the United Kingdom premium rates and to declare a uniform rate of bonus in each territory. However, if the United Kingdom bonus rate is out of line with that customary in any local market it may be best to differentiate bonuses from the outset and to aim at an appropriate local bonus rate, charging premiums accordingly.

#### APPLICATION OF PRINCIPLES

4.1. Having outlined the principles on which overseas life business may suitably be transacted it is desirable to examine some of the practical problems which arise in applying these principles.

*Ear-marking of assets*

4.2. When deciding how the assets of the office should be ear-marked, it is necessary to keep in mind the fact that although the major part of the assets of the office represents cover for the valuation liabilities on realistic bases, there is a balance of assets which represents the surplus funds (or the estate) of the office. In this statement I have made use of the terminology employed by F. M. Redington in his paper entitled *Review of the principles of life office valuations* (*J.I.A.* 78, 286).

4.3. From the point of view of the office, ear-marking of any part of the assets exclusively as security for the policies of a particular overseas branch is undesirable because the office cannot provide the maximum degree of security for its policyholders as a whole unless it can in the limit make any of its assets available to meet the liability under any of its policies. In some territories, however, legislation requires assets to be ear-marked equal to published valuation reserves and gives local policyholders a prior claim on such assets. While the reasons for this can be understood, it is important that ear-marking for this purpose should not extend more than is necessary to assets in excess of realistic liabilities, because the ear-marking of assets corresponding to the estate as the exclusive security for policies in a particular territory is most undesirable and is contrary in principle to the conception that each policy enjoys the security of the office as a whole. Even if the whole of the assets are not available equally as security for all policies it is important that the estate should be available in this manner. It is therefore important to employ valuation bases for both liabilities and assets in each territory which do not involve ear-marking the estate of the office to an unnecessary extent. A net premium valuation of the United Kingdom business of a well-established office would not normally be regarded as locking up the estate in an undesirable manner in the published liabilities, because the excess of the published net premium reserves over the realistic Zillmerized reserves is not a high proportion of the latter and also because the publication of net premium reserves does not establish for United Kingdom policyholders a prior claim on the corresponding assets. In an overseas branch, however, where the new business strain involved in a net premium valuation is usually a high proportion of the Zillmerized reserves, the use of a net premium valuation may well be considered undesirable, especially if it establishes a prior claim for local policyholders on the corresponding amount of assets. The considerations mentioned above must not, however, induce the use of a valuation basis the adequacy of which could be open to question. Moreover, there are limits to the degree to which the valuation basis should be weakened in relation to local custom.

4.4. There is, however, a sense in which the ear-marking of assets to overseas branches is proper and indeed desirable, and that is for the purpose of determining bonus rates. If bonus rates are to be determined in the light of the surplus earned in each territory, it is necessary to ear-mark assets for this purpose, and it is not realistic to ear-mark only those assets built up by the operations of the branch itself (i.e. the excess of its income over expenditure with interest earned thereon). When overseas business is launched on a major scale in well-developed local markets, capital expenditure must be incurred to establish it as a going concern. This expenditure will probably

prove to be permanently invested in the business; in any event, it is unrealistic to imagine that it will be possible for a branch to compete in the local market while, at the same time, repaying within a short period from its emerging surplus the capital expenditure incurred in the early years. Hence, the assets ear-marked to the branch for the purpose of the bonus declarations will normally exceed the assets built up by the operations of the branch itself. When it is decided that the branch has developed sufficiently to implement the principle of declaring bonuses dependent on local results it is necessary, in order to make allowance for establishment costs and to make the bonus arrangements workable, to decide the amount of assets which should be credited to the branch as a supplement to the funds which it has itself built up. This is a matter for judgment in the light of the particular circumstances, but the following considerations must be taken into account:

(a) It is not practicable to operate a system of bonus declarations based on local bonus earnings, unless sufficient assets are credited to enable the branch to stand on its own feet in future and to declare bonuses which enable it to secure business in the local market.

(b) It is undesirable to credit to overseas branches assets to such an extent as to deprive United Kingdom policyholders of an appropriate return from their policies.

4.5. It must be stressed that the ear-marking of assets for the purpose of determining bonuses is an internal arrangement made by the office for this purpose only, and the excess of the assets ear-marked over those built up by the branch represents for this purpose a supplement rather than a debt which must be repaid. Ear-marking for this purpose does not represent an irrevocable sharing of the assets of the office for all time, and in fact some modifications may from time to time prove to be desirable. More important, this ear-marking would not be a measure of the assets to be regarded as relating to the branch business for all purposes, e.g. if the business were transferred to another office or if it were nationalized.

Fuller details of how a system of ear-marking for the purpose of determining bonuses can be operated in practice are given in the Appendix.

#### *Premium bases*

4.6. Overseas premium bases should reflect the expected local experience, but the principles involved in their determination are the same as those which are applicable to United Kingdom business. It is inappropriate in many territories to regard taxation as a charge on interest income, and it is desirable that provision for it should reflect appropriately the basis on which it is charged, as is done, for example, if the true net interest basis is used in the United Kingdom.

4.7. In most of the Dominions of the British Commonwealth life business is issued for a rather longer average term than in the United Kingdom, but, on the other hand, there is only a limited supply of suitable long-term assets. Thus, in deciding upon an interest rate for use in premium bases, allowance should be made for the expected consequences of reinvestment on the maturity of the original assets. Interest bases should, therefore, place more emphasis on the estimated long-term future yields on new investments and less on the interest rate for new investments current at the date of issue of the

policy than in the United Kingdom where the term of the assets can, if desired, be matched, or at least matched reasonably closely, to the term of the liabilities.

4.8. The premium bases, particularly those for non-profit contracts, should be so aligned between territories that they each make their proper contribution to the estate of the office. Thus, if it is traditional in a certain territory for a wide selection of options to be granted under life policies, this should be reflected in the contingency loadings in the premium bases for the territory. When fixing contingency loadings for overseas policies, moreover, it should not be overlooked that in certain territories prior claims on certain assets have been established, and if holders of policies in those territories thereby enjoy greater security, this fact should theoretically be reflected in their premium rates. It is not suggested that there is any scientific means of reducing such considerations to figures, but they should be among the factors influencing premium bases.

#### *Valuation bases*

4.9. Ignoring considerations arising from overseas legislation, an office would apply similar principles in fixing the published valuation bases for liabilities under its overseas business and the corresponding assets to those it applies in relation to its United Kingdom business. Having accepted the principle that premium bases in each territory should reflect the expected local experience, it is consistent that the valuation bases should be separately decided so as to be appropriate in each territory. In practice it should be found possible to use the same valuation basis for a group of territories where theoretical considerations indicate that similar bases would be appropriate. In view of the fact that the term of the liability outgo for overseas business normally exceeds that of the asset income, due allowance should be made for reinvestment when deciding upon the valuation bases for overseas liabilities.

4.10. Overseas legislation, however, influences the choice of valuation bases as follows:

(a) The office must comply with any requirements as to minimum valuation bases for liabilities and maximum valuation bases for assets.

(b) For the reasons mentioned in § 4.3 the bases should not involve locking up the estate unnecessarily. The existence of a minimum valuation basis for liabilities may involve the locking up of the estate locally to an undesirable extent when interest rates are high if assets are valued at market values. Therefore the office may think it proper to value assets at higher than market values (e.g. amortized values) in local statutory returns in special circumstances where legislation permits and where this is consistent with the practice of local companies. This decision, however, would in no way prejudice the freedom of the office to give a market value certificate in the balance sheet for its business as a whole, since to give such a certificate would not involve it in hypothecating an excessive amount of the estate as security for policyholders in one particular section of the business.

#### *Bonus declarations*

4.11. In § 12 of the paper by Redington to which reference has already been made, the author discussed bonus distributions on the assumption that assets were approximately matched to liabilities. He advocated the use of a passive realistic modified net premium valuation as a means of assessing



the surplus emerging from year to year from the business in its own right. This surplus would be increased by interest on the estate to give the total emerging surplus and, after deduction of a suitable transfer to increase the estate, would give the surplus available for distribution. The passive valuation basis has no regard to the maintainability of the bonus rate, but this is not a material objection to its use as a guide to the bonus rate to be declared if assets are broadly matched to liabilities by term, since complete matching in itself automatically ensures a reasonable stability of bonus rates as interest rates change. The passive valuation basis without adjustment is not, however, a satisfactory guide to the distributable surplus where liabilities are considerably longer in term than assets and where, in consequence, the problem of the maintainability of the bonus rate is of importance.

4.12. The mean term of the assets corresponding to overseas business is normally short as compared with the mean term of the liabilities. This arises because overseas contracts are issued for a long average term, and the disparity in term is accentuated if, as is often the case, the mean duration in force of overseas business is short.

The fact that the liabilities are of a longer mean term than the assets makes overseas bonus rates vulnerable to changes in rates of interest to a much greater extent than United Kingdom bonuses, and gives rise to special problems in connexion with bonus declarations.

4.13. The extent to which bonus earnings are vulnerable to changes in the rate of interest depends on the term of the asset income in relation to that of the liability outgo and the table on page 10 provides a comparison of the position under three different investment systems:

(a) Total immunization, i.e. the system of investment defined in the paper by Redington.

(b) Paid-up immunization, i.e. the system of investment described in the paper entitled *A consistent system of investment and bonus distribution for a life office* by G. V. Bayley and W. Perks (*J.I.A.* 79, 14).

(c) Where the mean term of the asset income is zero, i.e. where the assets earn interest at the market rate for new investments from time to time but no fluctuations occur in their market value.

A comparison of the annual bonus emerging under these three systems of investment is shown in the table using the same fund as was used in the illustrations in the paper by Bayley and Perks and the same assumptions, which for ease of reference are repeated below. The fund contains only 30-year endowment assurances subject to annual premiums which allow for a simple reversionary bonus of 30s. % for each premium paid, and for claims to be paid at the end of each policy year. Premiums are calculated using the A1924-29 ultimate table with 3% interest. Expenses and other loadings are ignored. It is assumed that  $l_{30} \times 10^{-3}$  persons have effected policies on 1 January of every fifth year from and including 1927, that the experience up to 31 December 1956 coincided with the premium basis and that there are no lapses. It is not suggested that the fund used is typical of overseas business; it would be more realistic to assume an increasing rate of new business from year to year. The table is intended to do no more than illustrate the position, and to use the same fund as was used by Bayley and Perks facilitates comparison with the figures in that paper.

**Consequences of a permanent change in the rate of interest from  
3% to 3½% on 31 December 1956**

Number of years since the change in interest rate	Equivalent uniform rate of bonus per cent that the surplus would provide		
	Total immunization	Paid-up immunization	Mean term of asset income zero
	£ s. d.	£ s. d.	£ s. d.
0	1 10 0	1 12 5	2 2 6
5	1 11 0	1 13 9	2 1 6
10	1 12 1	1 15 0	2 0 8
15	1 13 5	1 16 1	1 19 10
20	1 14 10	1 17 1	1 19 2
25	1 16 6	1 17 10	1 18 7
30 and later	1 18 4	1 18 4	1 18 4

**Notes**

(1) The figures for 0 years since the change in interest rate are those applicable immediately following the change.

(2) The equivalent uniform rates of bonus are the weighted averages, using  $A_{x+t:\overline{n-t}|}$  as the weights, of the earned rates of bonus calculated separately for assurances at the various durations in force from time to time.

(3) Under total immunization the bonus earned by all assurances issued prior to the change is £1 10s. %.

(4) Under paid-up immunization the bonus earned by the paid-up assurances secured by premiums paid prior to the date of change is £1 10s. %, while benefits secured by premiums paid on such assurances after the change earn bonuses as if those premiums were applied to new assurances for terms equal to the unexpired terms of the existing assurances. The bonus rates earned by assurances in force at various durations are set out below:

Number of years in force at date of change in the interest rate	0	5	10	15	20	25
Bonus rate earned	£ s. d. 1 18 4	£ s. d. 1 16 3	£ s. d. 1 14 7	£ s. d. 1 13 2	£ s. d. 1 12 0	£ s. d. 1 11 0

(5) Where the mean term of the asset income is zero, the value of the assets is unchanged by the change in the rate of interest, being equal to the valuation reserve at 3%, and the rate of bonus earned by an assurance  $t$  years in force at the date of change is therefore  $b$  calculated by the following formula:

$$(1 + 0.015t) A_{x+t:\overline{n-t}|} + 0.015(I A)_{x+t:\overline{n-t}|} - \pi_{x:\overline{n}} \ddot{a}_{x+t:\overline{n-t}|} \\ = (1 + 0.015t) A'_{x+t:\overline{n-t}|} + b(I A')_{x+t:\overline{n-t}|} - \pi_{x:\overline{n}} \ddot{a}'_{x+t:\overline{n-t}|},$$

where unaccented symbols are at 3% and accented symbols at 3½% and

$$\pi_{x:\overline{n}} = \frac{A_{x:\overline{n}} + 0.015(I A)_{x:\overline{n}}}{\ddot{a}_{x:\overline{n}}}$$

The bonus rates earned by assurances in force at various durations are set out below:

Number of years in force at date of change in the interest rate	0	5	10	15	20	25
Bonus rate earned	£ s. d. 1 18 4	£ s. d. 1 19 8	£ s. d. 2 0 10	£ s. d. 2 1 11	£ s. d. 2 2 9	£ s. d. 2 3 7

(6) The bonus earned by assurances issued after the change is £1 18s. 4d. which-ever investment system is used.

It is surprising to note that the figures in the table illustrate that where assets are invested shorter than is required for paid-up immunization, the earned bonus rate may be more vulnerable to interest changes than is the bonus-earning capacity of new business (which is increased from £1 10s. % to £1 18s. 4d. % by the change of  $\frac{1}{2}$ % in the interest rate). Although it is possible to obtain an estimate of the earned rate of bonus for the fund having regard to the mean term of the asset income, the declaration from time to time of the earned bonus rate for a fund invested very short is unlikely to be regarded by policyholders as equitable.

Under total immunization there is no need to smooth out the effects of changes in interest rates when declaring bonuses; and, in fact, it is thought by some that this system of investment imposes too much stability on bonus rates. At the other extreme, if the mean term of the asset income is nil, the only problem in bonus distribution is to smooth out the effects of changes in the rate of interest. Overseas life business is, at the present time, close enough to this latter position to make this smoothing process of considerable importance, and it is desirable to consider how it may suitably be carried out in practice.

4.14. If assets are materially shorter in term than liabilities it is desirable to have the following information available when making a bonus declaration:

(a) Bonus earnings, excluding those from interest on the estate, using the method described by Redington, together with an indication of the effect thereon of a change in the valuation rate of interest and also in the earned rate of interest. The effect of changes in these rates of interest will enable the actual results for the year to be adjusted to those which would be obtained if any chosen rate of interest were earned in the year and the corresponding valuation basis used. Hence, the results obtained using the earned rate of interest may be adjusted to remove the effects of what are considered to be abnormalities in that rate.

(b) Bonus earnings from abnormal or non-recurrent items included in the surplus for the year other than those arising from the rate of interest.

(c) Bonus earnings from interest on the estate and the effect thereon of a change in the earned rate of interest and also in the valuation rate of interest (which will affect the amount of the estate).

(d) Approximate bonus reserve valuations of the liabilities at two rates of interest and valuations of the ear-marked assets at the same rates, in order that the effect of a change in the rate of interest on the bonus-earning capacity of the business in force may be assessed.

(e) The bonus-earning capacity of new business being written at the current rate of interest and the effect thereon of a change in the rate of interest. These figures would take into account contributions to bonuses from non-profit and annuity business.

4.15. In order to obtain an indication of the bonus to be declared it is first necessary to adjust the bonus earnings in (a) above so as to remove the effect of the abnormal or non-recurrent items in (b). Next it is necessary to adjust the interest income as follows:

(a) To move from a running yield to a redemption yield.

(b) To make a transfer to the estate in respect of investments affording less than absolute security, of a suitable amount to meet the risks of income defaults

and depreciation. A method of dealing with this problem was described in Appendix I of the paper entitled *A broad analysis of the problem of the investment of life funds* by H. G. Clarke (*J.I.A.* 80, 335).

(c) To reduce the effect of the fluctuations in the interest yield which remain after adjusting for (a) and (b). The extent to which the effect of such fluctuations should be smoothed must be a matter of judgment. The problem may be regarded as one of determining a stabilized rate of interest corresponding to the rate of interest underlying the surplus earned for the year. In deciding upon this rate it may be found helpful to make an estimate of the average rate of interest which is likely to be earned in the territory in the future and to determine the stabilized rate each year using the following conception: stabilized rate = average interest rate +  $K$  (earned interest rate for year - average interest rate), where  $K$  is a factor between zero and unity determined having regard to (i) the extent to which the mean term of the asset income is short in relation to that of the liability outgo, and (ii) the extent to which the policyholders would expect the effects of interest fluctuations to be smoothed, which depends largely on the tradition established by offices operating in the territory so far as bonus declarations are concerned. The average interest rate should for this purpose include allowance for the redemption yields of redeemable securities, and the earned interest rate for the year should include allowance for redemption yields based on purchase prices. Having determined the stabilized rate of interest for the year the surplus should be adjusted not only in respect of the interest income but also by using a valuation basis corresponding to the stabilized rate of interest. It is not suggested that this problem is capable of mathematical solution by the use of a formula; the formula does no more than give formal expression to a suitable approach.

Thus, from the surplus in (a) in § 4.14 it is possible to arrive at a surplus eliminating abnormal and non-recurrent items and stabilized as regards interest fluctuations, and a guide to the surplus to be distributed can be obtained as follows:

	Amount	Rate of bonus
(1) Surplus earned in the year by the business in its own right as in (a) in § 4.14	...	...
(2) Abnormal and non-recurrent surplus as in (b) in § 4.14 transferred to estate	...	...
(3) Surplus earned excluding abnormal and non-recurrent items ((1) - (2))	...	...
(4) Interest on estate as in (c) in § 4.14	...	...
(5) Transfer to estate to move from a running yield to a redemption yield and for risk of interest income defaults and depreciation (i.e. for (a) and (b) of § 4.15)	...	...
(6) Transfer to estate for interest stabilization (i.e. for (c) of § 4.15)	...	...
(7) Stabilized surplus on the valuation basis corresponding to the stabilized interest rate including interest on estate ((3) + (4) - (5) - (6))	...	...
(8) Estate interest included in (7)	...	...
(9) Stabilized surplus earned by business in its own right ((7) - (8))	...	...
(10) Transfer from stabilized surplus (including estate interest) to strengthen estate	...	...
(11) Distributable surplus ((7) - (10))	...	...

Lines (8) and (9) are not an essential part of the determination of distributable surplus, but it is desirable to compare the distributable surplus with the stabilized surplus earned by the business in its own right (line (9)). It is important to note that the distributable surplus (line (11)) will exceed the stabilized surplus earned by the business in its own right (line (9)) if the estate interest (line (8)) exceeds the transfer to the estate in line (10), as may well be the case in stable conditions for a well-established overseas branch.

Items (2), (5) and (6) may be either positive or negative in sign. The transfer to strengthen the estate in item (10) will be decided having regard to

(i) the likely future trend of bonuses earned by the business in its own right. (The bonus rate will move over a period from that earned by the business in force to that earned by new business currently being written.)

(ii) the need to ensure that contributions from each territory to the estate are properly aligned and have regard *inter alia* to the amount of the estate ear-marked to each territory in relation to the liabilities in the territory and to the likely claims of each territory on the estate for contingencies. Similar considerations arise in this latter connexion to those mentioned in § 4.8 as regards contingency loadings for non-profit business.

By the means outlined, it should be possible to decide upon a bonus rate to be declared which will, after taking credit for the interest on the estate of the branch, enable an adequate contribution to be made to the estate. Moreover, it is desirable, so far as is possible, to declare a rate of bonus which will not be markedly more or less vulnerable to future changes in the rate of interest than will the bonus rates being declared by competing companies; this means that if a branch is young so that assets are not matched as closely to liabilities as are those of competing companies, it is important to preserve a margin in bonus declarations when interest rates are high. The fixing of a bonus rate to meet these requirements must involve a considerable degree of judgment, taking into account not only the information described above but also those important intangible factors which cannot be reduced to figures.

#### *Non-profit business*

4.16. The proportion of the total business in each territory which should be written on a non-profit basis should be considered, keeping in mind the fact that each branch stands largely on its own for bonus purposes and the determination of a suitable proportion for each territory should have regard to the following:

(a) The fact that non-profit business increases the vulnerability of the bonus rate to changes in experience. When experience is favourable profits from non-profit business augment the higher bonus earnings from with-profit and *vice versa* when experience is unfavourable, and

(b) The proportion which is traditional in the territory in question.

4.17. Having regard to the relatively high degree to which bonus rates on overseas business are vulnerable to changes in rates of interest, caution must be exercised in writing non-profit business and thereby increasing this vulnerability. Moreover, the fact that the overseas business of a British office will probably be of shorter average duration in force than that of well-established local offices, tends to increase the mean term of its liabilities and thus to make its bonus rate more vulnerable to interest changes than those of

local offices. It is, therefore, considered that it is desirable, while overseas business is developing, to aim at a somewhat lower proportion of non-profit business than is traditional in the local market.

#### *Investment policy*

4.18. In order to implement the policy of matching assets and liabilities by currency, assets should be held in each currency in which business is transacted equal, at least, in value to the realistic modified net premium reserves in that currency. If all currencies were equally strong, and if interest yields and facilities for investment were the same in all currencies, it would be reasonable to invest the estate in currencies broadly in proportion to realistic reserves, but the office may justifiably regard itself as free to be influenced by its views as to the relative strength of the different currencies in deciding how assets corresponding to the estate should be invested by currency. Moreover, legislation as to the asset-cover of published valuation reserves may, in some territories, interfere with the freedom of the office in this matter. It will be seen that the implementation of the currency matching policy envisaged above may cause the funds ear-marked to a branch for the purposes of bonus declarations not to be wholly in local currency (even though the business of the branch is entirely in that currency) if, for example, it is felt preferable, in special circumstances, not to invest any part of the estate in that currency. Should a currency be revalued, the profit or loss arising from the consequences of giving effect to the views of the office as to the desirability of investing the estate in that currency are probably best not credited or charged entirely to the individual branch in question.

4.19. There is also the problem of how assets in a given currency should be spread between different types of security. The investment portfolio in each currency should normally be viewed as a separate entity, and the proportions of the assets to be held in each type of security should, unless legislation limits the freedom of the office, be fixed having regard to what the office considers suitable for its assets as a whole, to local factors affecting the desirability of investing locally in different classes of security, to local investment facilities and also to what is traditional for local offices. The office is, however, justified, if it regards an investment proposition to be particularly desirable, to have some regard to the amount of its total world assets in deciding how much to invest therein, provided that any profits or losses arising from the distortion of the local investment portfolio are not credited or charged entirely to the branch.

#### CONCLUSION

5.1. It may be thought that to adopt the conceptions envisaged in this paper amounts virtually to the establishment of a number of separate overseas offices. Admittedly, it does tend in that direction but subject to a most important qualification. All policies enjoy the security of the office as a whole and, while operating with due regard to the legislative background and the overseas markets concerned, the prime responsibility of an office transacting overseas life business is to ensure, so far as possible, that each branch makes contributions to the estate of the office which are appropriate in relation to the

benefits which it is likely to derive therefrom. This alignment of the different branches is achieved through the premium basis for non-profit contracts and through both premium bases and bonus rates for with-profit contracts.

5.2. It was my good fortune to be a member of a team engaged in the development of overseas life business over a number of years, and I gratefully acknowledge that the content of this paper derives from the pooling of the thoughts of the members of that team both in the United Kingdom and overseas. Moreover, I am indebted to a number of my colleagues for advice in preparing this paper.

#### APPENDIX

An illustration is given below of a practical method of handling the problems arising from the ear-marking of assets for the purpose of the bonus declaration. The method avoids the labour involved in ear-marking individual assets. It is assumed that on a given date a decision is reached as to the total quantum of assets to be ear-marked in terms of book values. It will then be necessary to determine the total amount of the ear-marked assets from year to year, the interest income corresponding thereto and the surplus arising from the operations of the branch. It is assumed that all the business transacted by the branch is in the appropriate local currency.

Let  $F$  = sterling equivalent of total book values of assets ear-marked to the branch.

$A$  = sterling equivalent of total book values of assets which are in branch currency.

$V$  = sterling equivalent of realistic modified net premium valuation reserves.

$S = F - V$  = sterling equivalent of estate in excess of realistic modified net premium valuation reserves.

The suffixes 0 and 1 used in connexion with the above indicate values at 31 December of the previous and current year respectively, using the rates of exchange then current.

$\Delta EA$  = sterling exchange difference arising from revaluation of  $A$  on 1 January at the rate of exchange ruling at 31 December of the current year (i.e. sterling equivalent of  $A_0$  at the rate of exchange ruling on 31 December of the current year minus  $A_0$ ).

$\Delta EV$  and  $\Delta ES$  are the corresponding exchange differences relating to  $V$  and  $S$  respectively.

$IF$  = sterling equivalent of interest income on ear-marked branch assets.

$IA$ ,  $IV$  and  $IS$  are the corresponding interest incomes corresponding to  $A$ ,  $V$  and  $S$  respectively.

$iF$  = rate of interest earned on  $F$ .

$iA$  = rate of interest earned on  $A$ .

$i_F$  = rate of interest earned on the sterling assets held in respect of the ordinary life business of the office as a whole.

$RF$ ,  $rF$ ,  $RA$ ,  $RV$ ,  $RS$ ,  $rA$  and  $r_F$  correspond to  $IF$ ,  $iF$ ,  $IA$ ,  $IV$ ,  $IS$ ,  $iA$  and  $i_F$  but replacing interest by profit on investments, i.e. realized profits less losses plus writing up less writing down of book values (such writings up and down including those necessary for amortization based on book values).

$(P' - C - E)$  = sterling equivalent of cash amount of premiums received less claims, commission and expenses.

$T$  = tax charged in respect of branch business, all of which is assumed to be chargeable against  $IA$ .

$D$  = dividends to shareholders arising from branch business.

Then the mean funds on which interest is earned are:

(1) Mean fund corresponding to  $F_0$

$$MF = F_0 + \Delta EA + \frac{1}{2}(P' - C - E)$$

and

$$iF = \frac{IF}{MF} \quad \text{and} \quad rF = \frac{RF}{MF}.$$

The use of  $\Delta EA$  in the above formula causes the effect of any currency mismatch as between  $F_0$  and  $A_0$  to be borne by the branch and assumes that any excess of  $F_0$  over  $A_0$  is covered by sterling assets. If, for the reasons indicated in § 4.18 of the paper, it is not desired that the branch should bear the consequences of any mismatch an appropriate adjustment must be made.

(2) Mean fund corresponding to  $A_0$

$$MA = \frac{1}{2}[A_0 + \Delta EA + A_1 - IA + T]$$

and

$$iA = \frac{IA}{MA} \quad \text{and} \quad rA = \frac{RA}{MA}.$$

(3) Mean fund corresponding to  $V_0$

$$MV = V_0 + \Delta EV + \frac{1}{2}(P' - C - E).$$

(4) Mean fund corresponding to  $S_0$

$$MS = F_0 - V_0 + \Delta EA - \Delta EV.$$

(a) *Calculation of ear-marked branch assets from year to year*

$$F_1 = F_0 + \Delta EA + (P' - C - E) + IF - T + RF - D.$$

(b) *Calculation of interest income and profit on investments on ear-marked branch assets*

(i) where  $MA > MF$ :

The ear-marked assets are assumed to be a proportion of  $A$ ,

$$IF = iA(MF),$$

$$RF = rA(MF).$$

(ii) where  $MA < MF$ :

The whole of  $A$  is ear-marked and the shortfall deemed to be covered by sterling assets (which are not in fact specifically ear-marked),

$$IF = IA + i\frac{A}{MF}(MF - MA),$$

$$RF = RA + r\frac{A}{MF}(MF - MA).$$

In both cases (assuming that  $MF > MV$ )

$$IV = iF(MV),$$

$$RV = rF(MV),$$

$$IS = iF(MS),$$

$$RS = rF(MS).$$



(c) *Calculation of realistic surplus*

(i) Realistic surplus earned by business in its own right (i.e. excluding surplus arising from the estate)

$$V_0 + \Delta EV + (P' - C - E) + IV - T + RV - V_1,$$

assuming that the whole of the tax is chargeable to the business and none to the estate.

(ii) Surplus arising from the estate

$$IS + RS + \Delta EA - \Delta EV,$$

assuming that the effect of any currency mismatch is to be borne by the branch.

(iii) Total realistic surplus

$$V_0 + \Delta EA + (P' - C - E) + IF - T + RF - V_1,$$

because  $V + S = F$ .

## ABSTRACT OF THE DISCUSSION

**Mr R. S. Skerman**, in introducing the paper, said that there were two shortcomings which should be mentioned. First, the paper was based on an experience of overseas life business which was limited, with a few unimportant exceptions, to territories within the Commonwealth. It might well be that if his experience had related to other territories the emphasis of the paper would have been different; but it had not been practicable to convey that limitation in the title of the paper. Secondly, the paper dealt with actuarial principles, but those were not the only factors which were relevant to the transaction of overseas life business, and every aspect of its conduct must be sound if success was to be achieved.

**Mr H. F. Purchase**, in opening the discussion, said that, since Gardner's paper in 1935, there had been many changes in the conditions under which offices operated overseas, and they naturally affected the emphasis given to a number of conflicting principles.

The essential aim, as the author stated in §3.1, was to decide upon a method of operation intermediate between the two conceptions that the worldwide business of the office was one homogeneous whole and that each branch was an independent unit. In view of the changes which had taken place in the world since 1935, it was hardly surprising that, compared with Gardner's paper, the author's paper arrived at conclusions which were closer to the latter and more nationalistic conception. The author pointed out that the approach outlined in his paper amounted virtually to the establishment of separate overseas offices, but said that that was subject to the qualification that each policy would enjoy the security of the office as a whole. Even that qualification was, he (the speaker) thought, of more theoretical than practical importance, because, short of some unexpected catastrophe, it was difficult to envisage that an office would allow any of its subsidiaries to approach a position where the ultimate security of its contracts was in question. The differences between the procedure suggested in the paper and that of forming separate subsidiaries would, he thought, be found largely in non-actuarial spheres, but they might affect the actuarial principles which were being considered in so far as a different method of financing the commencement of operations was involved.

Gardner had expressed the problem in the form of the question 'It is customary to average within the same country; should we average over a group of countries?'

With regard to premium bases he (the speaker) thought that in modern conditions the only answer could be that given by the author in §3.4. It was necessary to calculate premiums separately for each territory, having regard to the expected experience of the office in that territory, and to make allowance in the contingency loading for factors such as those mentioned in §4.8.

But in respect of the allocation of profits the answer was more difficult and he did not see why, with certain qualifications, offices should not average their worldwide profits or losses, regarding the inequities which resulted between different countries as being within the 'band of tolerance normally accepted with the uniform reversionary bonus system', in the same way as they normally averaged the experience of whole-life and short-term endowment assurances. Since an office decided to operate in an overseas territory presumably in the hope of making a profit which would accrue to its shareholders and to its with-profit policyholders elsewhere, it did not seem unreasonable that there should be

some sharing of the profits or losses which resulted from that decision, provided that premium rates for new policies in the various countries remained consistent with the expected rates of bonus, which need not be uniform throughout the world.

The qualifications to what he had said became apparent if the problem was considered from a historical point of view, because in a rapidly changing world technical difficulties might be involved. The reversionary bonus system was, however, based largely upon tradition, so that, if the premium rates were suitably loaded for a reversionary bonus, he did not feel offices need concern themselves unduly with marginal inequities such as existed between different generations of policyholders.

Originally, the overseas business of a British office had been regarded as an adjunct to its business, often being organized on an agency basis rather than by means of well-established branches. Business often came from the general insurance connexions of the office and used to be spread over a larger number of territories. Business on the European continent had then been more important (although with modern political movements it was not impossible to visualize a return to that position). Controls of offices' business had been few, money had been freely remittable between countries linked by the gold standard, and Britain had been the centre of the world's trade to a greater extent than at the time of speaking. In fact, in every respect the prevailing economic atmosphere had been that of *laissez-faire*, as a consequence of which rates of interest in different countries, although they might have been at different levels, had tended to move in sympathy with one another. Moreover, taxation and competition from local offices had not been considerations of any importance to British offices. In conditions such as those, it was to be expected that the attitude towards bonus distributions would be an international one, and that the business of the office would be considered as a homogeneous whole.

Having written business under those conditions, however, offices had been faced with a number of changes. Controls on the assets had been introduced and in some cases applied to existing business. At the same time, offices had to contend with other types of legislation such as exchange control, higher taxation, and restrictions on policy conditions, as well as more general legislation governing staff and management. Moreover, countries had introduced into their economy the principle of managed rates of interest, so that it was no longer true that rates of interest moved in sympathy with those elsewhere. Those altered conditions could, of course, be taken into account for new premium rates, but not for existing business.

Thus, as a principle, it was necessary to consider two different and not easily distinguishable types of profit. On the one hand, there was the type of profit which might be regarded as normal. In general, that would consist of profit arising because the actuary, in assessing his premium rates, either incorrectly assessed his experience or included a safety margin. It would not be unreasonable to regard it as including profit from non-participating policies, since there did not seem to be any strong ground for allocating such profit only on a national basis, especially if the author's argument was borne in mind that each contract of the office enjoyed the over-all security of the office. On the other hand, there was the type of profit, which the actuary could hardly foresee, arising from a deliberate Government policy designed for the over-all advantage of the nationals of the country concerned. An office which had been willing to average out the former type of profit had been less willing to average out the

latter type, and it seemed to have been that position which had caused offices reluctantly to depart from the old principle of uniform bonus rates.

It seemed to him that they had a choice. They could continue to apply the principle of averaging profits, in which case an adjustment should be made to the resulting rate of bonus to allow for the type of profit or loss which arose from Government action. That such adjustment could not be exact had to be accepted; but it would be easy to exaggerate the importance of the resulting error and the effects of competition would be likely to prevent any undue bias. Alternatively, they could depart from the principle of averaging profits and losses and adopt the type of method described in the paper. Even the author's proposals would not, of course, eliminate entirely the worldwide approach, with the consequent imprecision which that seemed to involve, because there was bound to be some obscurity in the treatment of the initial expenditure which was required to start operations in a country, as well as in the somewhat arbitrary allocation of head office expenses and interest on the office's estate. Moreover, there were places in the paper where the author said that the judgment of the actuary would be needed. Those points might well have marginal effects on the rate of bonus, which could lead to results comparable with the alternative approach which he (the speaker) had described.

Although there might be no great difference between the results of the two methods, they could produce significant differences in certain circumstances. The main technical difference appeared to be that in the international approach offices would keep their with-profit rates in each country reasonably in line with those elsewhere, having regard to the expected experience, as well as the expected bonus rate, in each country. The expected bonus rate would, in an old branch, reflect the last declared rate of the office in that branch and, in the case of a new branch, would have regard to the points made by the author in § 3·7(b). To that extent, therefore, there would be departure from the popular (but not very scientific) principle of not altering with-profit premium rates even though changed conditions affected various sections of the business differently.

The approach adopted was also likely to colour their views as to the necessity of matching assets and liabilities in each branch separately, or, where that was not possible because suitable investments were not available, of eliminating the effect on the bonus rate of changes in market rates of interest by a method such as that described in the paper. Of course, the office might prefer not to take too far the principle of eliminating the effect of changes in the rate of interest, but to give the public what it probably expected, namely high bonuses during periods of high interest rates and *vice versa*. But even where an office did wish to stabilize bonus rates, it did not follow from the conception of spreading normal risks throughout the business that it should be done independently for each branch to the extent described by the author. It was, however, desirable as far as possible to keep the term of assets and liabilities in each country in rough balance, if only to eliminate the risks which might otherwise attend a change in currency values. A parallel argument would apply to the question of spreading investments amongst the different types of security separately in each branch, referred to in § 4·19.

Whichever approach was adopted, they would need to analyse their profit and loss in each branch separately. Profits from mortality, expenses and so on would be calculated on normal lines. Interest and other investment profit would follow the general lines described in the appendix to the paper. Each branch would be credited with interest and profits on locally-held investments,

plus interest and profits on the balance of the mathematical reserves appropriate to the branch as well as on the appropriate share of the remaining reserves of the office. Since assets corresponding to the last two items would probably be held in the United Kingdom, that meant that each branch should be credited with local interest and profits plus the average United Kingdom interest and profit on the balance of funds appropriate to the branch.

He did not think that there could be a single answer to the question of the extent to which they should adopt the international or the national approach to their problem, because it had to depend upon circumstances. He would incline nearer to the author's approach in the case of a large branch or of a country which attempted to establish a prior claim on local assets for local policyholders; but he admitted to a personal disinclination, however strong the technical arguments, to going too far in the direction of segregating each branch of an office's business.

**Mr H. Dicken** cited the hypothetical case of an office which transacted the greater part of its business in Britain but also wrote a fairly considerable business abroad, split up between thirty or forty different territories, in no one of which it had a total business of more than 2000 to 3000 policies and total reserves of more than the equivalent of, say, £250,000. He maintained that in such a case it would be impracticable to go further in differentiation than the following three steps:

(a) for the reasons given by the author with regard to differences in local rates of interest, tax, mortality, commission and expenses, a separate set of premium tables would be necessary for each territory;

(b) for the same reason, there would have to be separate tables of surrender values and paid-up policies;

(c) again for the same reason, separate bases for changes of class and alterations of term would be required.

It seemed to him that none of those relatively small blocks of business would justify either the work or the expense involved in the considerable analysis suggested by the author in connexion with differential declarations of bonus. He would like to put forward some criterion as to the size of business below which it would be economically unjustifiable to undertake the work outlined in § 4.14 when making a differential bonus declaration. Although it was purely a matter of opinion and individual judgment, his own view was that it would not be worth while for a block of business (either in one territory or in a group of territories taken together for the purpose), where the net liability was less than about £1,000,000.

The next problem was how to divide the world between the various territories with regard to the conditions making the conduct of overseas life business, from the point of view of a United Kingdom office, (i) propitious, (ii) unpropitious, or (iii) impossible. Taking those three groups in reverse order, it was an unfortunate fact that in 1957 many territories came into the 'impossible' category, including India and Egypt, both of which had not long before been in the category of territories where conditions were 'propitious'. The main reasons for the relatively large and growing group of 'impossible' countries were the nationalistic and ideological changes in the world over the last 40 years.

Next came the group of countries where conditions, while not impossible, were unpropitious. The conditions, as indicated in the paper, were the severe measures of control in certain countries, including the requirement to invest the

whole of the reserves in local securities under the supervision of Government authorities, onerous forms of annual returns, and the blocking of balances, which meant that even if a profit was made it could not be remitted out whereas if a loss was made it had to be remitted in.

That left the territories where conditions were propitious, and there were not many of them which had developed a sufficient volume of business to justify the analysis which the author suggested with regard to differential rates of bonus. Moreover, the largest market for life business in the whole world, the United States of America, could scarcely be included in that category for two important reasons. First, if a composite office had elected to do fire and accident business in the United States, it was precluded by United States law from doing any life business at all; while secondly, even a purely life office might take the view that the strength and intensity of the competition involved in the United States made entry into that territory definitely unpropitious.

It appeared that most of the territories where a large business could be undertaken were the self-governing Dominions of the Commonwealth, such as Canada, South Africa, Australia and New Zealand. Apart from that group there was a large number of other territories where a small scale development was possible, a considerable proportion of those being in fact colonies or dependencies of the Commonwealth. It seemed that that analysis gave at any rate some part of the explanation why, on looking at the Board of Trade returns for the overseas life business of the British offices having United Kingdom head offices, it would be found that 90 % of that business was in fact transacted by six companies, and that the remainder of those offices had either little or no life business overseas.

**Miss M. C. Allanach** said that the position of policyholders who moved from one territory to another in which the office was transacting business, while not dealt with specifically in the paper, brought out several of the principles that the author had mentioned. While the numbers involved were probably small relative to the office's total business, they formed an important class. An office with branches in several countries could probably offer those people a greater range of service than could a local company, while there was also the possibility of the office's attracting business from them because of 'Home' connexions.

It was fairly clear that if such a policyholder intended to remain permanently in the new territory, his interests would best be served by a policy expressed in the currency of that country, so that it was not affected by fluctuations in rates of exchange; and, since it was likely that his existing policy was subject to the legislation and exchange control restrictions of his old country, it would be advantageous for him to have his new policy subject only to conditions in the new territory. One method of achieving those ends was to cancel the old policy and to substitute a new policy in the new branch. That involved one of the first points mentioned by the author, namely, that such a substitution involved, in effect, a transfer of funds and therefore exchange control approval might be required. Assuming, however, that that was obtainable, a number of actuarial problems arose concerning the terms under which the new policy should be issued.

First, what credit should be given for the policy? There was no difficulty, actuarially, in applying the reserve transferred as a reduction from all future premiums under the new policy. Alternatively, the value of the policy might be transferred in the form of a paid-up addition to the new policy. Either method

was feasible and could be adapted to fit in with branch practice, but practical difficulties could arise when, as indicated in the paper, the branches might hold reserves on differing bases. While in terms of a purely monetary transaction it was simple to transfer a sum from one branch and apply it to a new policy in another, anomalies could arise if, in the branch, larger or smaller sums would normally be applied to almost identical policies. A practical solution might be to make the substitution on the branch alteration basis, and for the branch to stand any strain or take any profit which might arise.

The premium rate to be charged and the bonus rates to be granted had also to be considered. As the author indicated, there were a number of advantages in charging branch rates of premium and having a level of bonuses consistent with local conditions. It followed that it was theoretically correct to charge the new block of entrants the branch premium rates and to allot the branch rate of bonus to them in future; but, while that was the theoretical answer, it might not give an equitable result in every case. For example, if the branch premium rates had been revised in an upward direction, there would be a strong case for allowing the transferred policyholder at least the benefit of the equivalent branch premium rates when his policy had first been effected. There was, further, the important point of how the transfer looked to the policyholder. It was fair to say that the individual policyholder looked on the office as worldwide and expected primarily an identical substitution of his existing policy (i.e. the currency equivalent of it) and any variation from that would have to be justified to him. While he would doubtless expect to participate in higher bonuses if the branch was declaring higher bonuses, and might be persuaded to pay a higher premium rate for a higher level of bonuses with the added currency and exchange control advantages which his new policy possessed, the situation was not so simple if he was proceeding from a territory with particularly low premium rates and high bonuses to one where the premium rates were higher and the bonus rates lower. A practical solution was essential in such a case, possibly on the lines of an identical substitution.

The solution of the problems involved in transfers of the kind in question was important for an office transacting business in a number of branches. Much goodwill could be achieved by a judicious blending of theory and practice, but much could be lost if the policyholder did not himself feel that he had been treated fairly, however actuarially sound his treatment might have been.

**Mr B. O. Rolph** felt that the author had successfully established the principle that for both premiums and surplus individual consideration was required for each foreign portfolio as well as for the general organization of the branch concerned. In view of the many complicated questions which followed from that principle, it was logical to ask what was the justification for doing business overseas at all. Presumably in the case of a proprietary office the extra risks run were reflected in the possibility of higher dividends, but for a mutual office, he thought that the answer lay in the greater spread of the risks to be averaged. His reference to averages and the spreading of risks was not confined to liabilities, but included assets as well; he felt that an office which had its assets and liabilities spread throughout the world (particularly in the rapidly changing modern world) would tend to be more soundly based than one which confined its activities to one country.

If that was so, the operations overseas must have some effect on the operations of the company as a whole. Possibly that was where the author ran into

difficulty in regarding each overseas portfolio as in many respects a separate entity. The speaker thought that normal underwriting risks, or, for want of a better term, random fluctuations, should be carried by the office as a whole. In other words, a notional idea of the surplus should be arrived at corresponding to the premium basis, and fluctuations in the underwriting in the wider sense of the term should be carried by the whole office. Only when changes took place which were long-term in effect rather than temporary should the standards used in assessing the expected surplus in a particular overseas branch be altered.

That led him to the question of retentions. If the view was adopted that normal underwriting fluctuations were carried by the whole office, there would be justification for having larger limits of retention on one life in a territory than if regard were had to the size of the office's operations in that territory alone. Some care would still be needed, however, because of the danger of exchange restrictions preventing the free movement of funds which might be needed one way or the other to meet large claims.

He thought that some clarification was needed of the author's important qualification on writing large volumes of non-profit business, because the author's remarks applied mainly to those types of policy which required the accumulation of large reserves. The ordinary contracts of a temporary nature, such as decreasing temporary insurance, family income policies and so on did not seem to be open to the same objection as the others, and a branch or portfolio overseas should be encouraged to write a good volume of those to help to add to the profit of the office as a whole.

A number of problems arose in connexion with the transfer of policies overseas. In past years such transfers had been almost negligible, but with the growth of emigration to the North American continent, and in particular to Canada, there was a growing number of problems and a growing number of cases to consider. He felt that a policy had to be issued in the currency and conditions of the country to which the emigrant went and, subject to exchange control agreement, which was usually forthcoming, the emigrant should be paid something between the surrender value and the reserve held in the home country. In most cases the emigrants went from the United Kingdom and a net Zillmerized reserve seemed suitable.

**Mr W. Perks** said that the first two columns of figures in the table in § 4.13 had been extracted from Tables 6 and 5 of the paper by Bayley and himself, but the first figure under 'Paid-up immunization' had been altered from £1 10s. 5d. to £1 12s. 5d. He thought that the author's figure applied to the point of time 1 year after the change in interest rate, and not to the time 0 as stated. That applied also to the first figure in the third column.

In the same section the author expressed some surprise that with a short investment position bonus rates earned could change more on the existing business than on new business. He was a little surprised that the author was surprised, because the author had obviously referred to the paper by Bayley and the speaker, where the point was clearly shown in the graphs in Fig. 1. Actually that position could apply whatever the term of the investments if the business was largely comprised of short-duration whole-life assurances effected at the younger ages. An increase in the rate of interest might lead to new premiums at age 30, for example, being less than the old premiums at age 25. In those conditions, even allowing for bonuses, it would pay many policyholders to surrender their policies and take out new ones. That kind of position had had



to be met in industrial assurance in the period after the first world war. It could easily happen in a country such as Canada, where so much business of the whole-life type had been written on young lives since the second world war. The main danger to security was in the other direction, when the rate of interest fell and the premiums on some of the existing business became inadequate, whatever the term of the investments. It could not be too often said at meetings of the Institute that the only way to security in a life business was to have adequate premium rates, sufficient reserves and as balanced a portfolio of business as possible.

On the main theme of the paper he would like to express agreement. It was, in his view, not only desirable but necessary, if success was to be achieved, to follow local practices and to maintain separate financial arrangements for each separate self-governing country in which an office operated. That included differential bonuses, and he emphasized differential bonuses particularly, because there were so many differences between one country and another, which changed from time to time. For example, since the partition of India, investment conditions in Pakistan had been such that it had not been possible to get as good a rate of interest as in India. Before partition, the effective tax basis had been on surplus less half the cost of bonus. After partition, India had improved the tax position of life offices by relieving 80 % of the cost of bonus but Pakistan had not yet made any change. While that kind of thing could happen it was, he thought, essential to have a system of differential bonuses to reflect changing conditions.

It was the common practice amongst British and South African offices to use the same premium scales in East Africa as were used in South Africa despite the fact that the tax basis in Kenya, for example, was quite different from that in South Africa. Even though that position might not continue, it illustrated the need to have different arrangements and to make provision for differential bonuses in different countries.

It would be seen from § 1.3 that the author had confined his discussion to overseas business transacted at the time of writing by a British office through well-established branches. That might explain some of the complications in the latter part of the paper, particularly over the so-called 'estate'. He did not find very helpful either the concept of the estate or the calculation of a hypothetical figure for it on certain arbitrary uniform assumptions which it was well known would not remain unchanged. A clear idea of the additions both to open and to hidden reserves was, of course, necessary to an actuary, but he did not need to compute the total closely. His own current interest in overseas business was mainly with the early stages of branches in several of the countries of the Commonwealth. Separate premium scales, separate accounts, separate valuations with Zillmer adjustments (subject, of course, to the statutory limitations on those adjustments in the respective countries) and differential bonuses had all been adopted from the beginning.

The main practical problem of the early stages of an overseas branch was the managerial problem of building up an agency organization. Full-time agents were essential if success was to be achieved, and they had to be subsidized during their early period, whether they had to be trained or had already been trained in another office. The establishment costs, relative to the volume of business written, could be very heavy in some countries. Perhaps the main problem for the actuary, in order to get a proper view of the progress of the business, was to sort out as well as he could the amount of the establishment costs from the

normal new business and running expenses. That problem continued for quite a long time as the business developed. Provided that establishment costs were financed from sources external to the branch, he saw no reason why an office should not expect the business in each country to be self-supporting.

**Mr J. B. Dow, F.F.A.**, said that from some points of view the transaction of overseas life assurance business, like politics, could be described as the art of the possible. There was a constant need to reconcile what was necessary or desirable in theory with what could be achieved in practice, and in recent years the requirements of practice had tended to encroach further and further on the realm of theory and the problems of overseas business had become increasingly more difficult in two particular respects and for two particular reasons, namely, legislation and competition.

As the author had indicated, overseas legislation was generally more restrictive than that to which offices were accustomed in the United Kingdom. Anyone who regarded the North American continent as the last and only stronghold of freedom should study the life assurance legislation of Canada and the United States of America. In one form or another that problem had always been with the life offices, but of recent years there had been a tendency towards discriminatory legislation, putting the overseas or invading company in an unfavourable position. In Ireland, for example, the life assurance premiums paid to Irish companies ranked for income-tax rebate at a higher rate than did those paid to non-Irish companies. In addition, legislation not specifically aimed at life assurance companies might have the effect of imposing a restraint on their actions. The best example of that was the network of currency restrictions which had grown up in the post-war years.

Competition in overseas markets was increasingly keen. Gone were the days when British companies had been teaching life assurance business in many parts of the world, and when their chief competitors had been local companies from which the British companies could always be distinguished by their practice of settling their claims promptly and in full. Gone also were the days when the adjective 'British' had been in itself an advertisement. The reputation attaching to the word was still high, but the sentiment which it evoked might be different.

On purely theoretical grounds it would seem that the larger the overseas branch and the better established it was the more nearly it could be treated, both actuarially and administratively, as an independent unit. Discriminatory legislation and intensified competition seemed to him continuously to force an office further along the road to separation than theory would suggest. For example, a company which was struggling to establish itself in a new field would probably find it necessary to follow local practice in such matters as policy conditions, premium rates, and perhaps even methods of declaration of bonus more closely than a company which was well established and whose stronger organization might be able to present and sell contracts which differed from local custom. Generally speaking, he thought that where that custom was different from British custom, a company was handicapping itself unduly by adhering to British practice too closely.

To take another example, theory suggested that a new overseas branch should aim at writing as much with-profit business as possible. That, however, might be precisely the time when it was most difficult to secure with-profit business in competition.

From the point of view of the company as a whole, perhaps the chief problem centred on the treatment of assets. The author laid it down as an essential principle of sound conduct that the assets should match the liabilities according to currency, and in current conditions, he imagined, most people would agree with that principle. A generation or more ago it might not have been so readily accepted. Up to 1914 at least it would have been argued that, since sterling was the strongest currency in the world, the actuary whose currency liabilities were matched by sterling assets would have no anxieties. Although there were currencies in the world which were weaker than sterling, he believed that not many people would still take that view. On the other hand, the argument might still apply to the American dollar. For example, an office with currency liabilities in some Central and South American countries, the economies of which were closely linked to the United States of America, might be content to have those liabilities matched by American dollar assets.

They should remind themselves that by matching assets and liabilities according to currency they immunized themselves against exchange profit as well as against exchange loss; but for most parts of the world where life assurance was vigorous the author's principle applied, and offices would wish to hold currency assets equal to their currency liabilities at least on some minimum basis of solvency. The theoretical answer to the question whether they should hold more than that seemed to him to depend largely on the view which they took of the economy of the country and the opportunities for investment which it offered. The practical answer might be supplied by local legislation, which might insist on offices holding more currency assets than they wished to do, or by currency restrictions at home or abroad which prevented the office from moving assets from one country to another as it pleased.

Those considerations raised the question whether overseas life business was worth while in current conditions. Various speakers had suggested reasons why it might be, and a further reason was that they went on doing it because they had been doing it for a long time. That was perhaps a sounder reason than at first sight it might appear to be.

Would the same expenditure of effort applied at home not produce a greater volume of business and result in larger contributions to the company's profits? Without wishing to be unduly pessimistic, he thought that in many cases the answer was that it would, particularly where a company was opening up in a well-established life assurance market. He would give that answer not only because of current difficulties, some of which might be temporary, but because of longer-term future uncertainties. As each country developed its own economy, there was an increasing tendency for it to wish to develop its own financial institutions and to restrict the activities of the incomer. He would guess, therefore, that in the future fewer new overseas branches would be opened by British life companies, though substantial volumes of overseas business would still be written in countries where British companies were already well established.

**Mr K. A. C. Wheeler** remarked that the author had admitted that the theory of the paper went nearly as far as setting up completely independent entities in each territory, but with the important qualification mentioned in § 5·1. Much of the paper turned on the acceptance of that approach, with which, however, he disagreed. He did not believe that it could be said without qualification in respect of worldwide business that all policies enjoyed the security of the office

as a whole. Perhaps they had done so once, but they did not do so any longer, and he thought would do so even less in the future. Factors quite outside the office's control existed which could, and in certain cases did, invalidate any such claim. Those factors did not all operate necessarily in one direction. For example, it was not beyond the bounds of possibility that nationalization in one form or another might take place in the United Kingdom. In the probable financial situation at such a time, it would not be certain that an overseas branch would be able to receive any further finance, whether by notional credits from an estate or by any other payments. Such branches might have to depend on the assets physically in the overseas area or under their control. Clearly the financial effect upon any organization dependent up to that time on a general estate could be severe.

If an overseas area was judged to be reliable for long-term development and for setting up a life assurance organization, he believed that it should be financially secure in its own right, including the strength needed to maintain the bonuses intended. The test of reliability, of course, had to be stringent. If the area was not judged to be so reliable, the office should not go there.

**Mr P. M. Madders** said that the paper made a strong case for differentiation of branch bonuses; but, even accepting the fact that a uniform world bonus was not desirable, he thought that it was an ideal which should only be abandoned reluctantly.

Differentiation in bonus level between branches could be tied to, say, some well-known index of interest level in the branches plus, perhaps, adjustment for the cost of unexpected tax changes; or broad differences in bonus level between branches could be arrived at by considering the general level of bonus and with-profit premiums in the different branches. There would be difficulty in arriving at a suitable basis, but the objections to such a method seemed less than to basing branch bonuses entirely on branch profits.

At first sight the ability of a branch to make profits seemed to be the obvious basis for a branch bonus, because that was the basis of the bonus for local competing companies; but there were significant differences between a branch of a world company and a local company. Branch profits were not necessarily based on the liability on a published basis and on the market value of the assets, but on a more arbitrary valuation basis and the value of an arbitrary allotment of assets; but the world company as a whole had to satisfy the bases of its published accounts, and so the bonus distribution could not be made completely independently for each branch. Again, the bonus decision was the same as the decision of how much to put to reserves in a year, and for a world company that decision could properly be taken only for the company as a whole.

Another difference from local companies was that ear-marked assets, and especially those corresponding to estate, were not necessarily invested in local securities at the local rate of interest. Where contingency funds were used to stabilize the rate of bonus declared, that could lead in time to significant differences in the profits of the branch from those of local companies. One of the main justifications for the equity of a reversionary bonus was the expectation of policyholders, and in the branch of a world company, where much was made in advertisements of the branch not being an independent unit, equity demanded some reflection in the bonus of the prosperity of the company as a whole. The position of with-profit policyholders might be likened to some extent to that of shareholders in a world company, who would not expect their dividend to be

dependent on the results of the business in the particular territory in which they happened to live.

Another reason why branch profits were not a good basis for branch bonus decisions was that the profits of a branch of a large company with, say, high retention limits would show large year-to-year fluctuations, and it was not a good basis for the year-to-year decision whether to leave the bonus unchanged or to alter it. Most important of all, from time to time the interests of the company as a whole clashed with and overrode the interests of a particular branch, and that had long-term effects on the bonus-earning power of that branch. An extreme example would be the decision to cease writing new business in a particular branch. More frequently, the views of a world company might lead to branch policy not altogether in tune with local market developments. The overseas connexions of the branch enabled it to take a more independent line than would a small local company, and it seemed reasonable that the profits or losses should accrue to the company as a whole rather than to a particular branch.

As an example, if in the past 10 years the world company had considered the market level of non-profit premium rates in a particular branch to be inadequate, the branch would probably have charged higher non-profit rates than were usual and would have written only a small volume of non-profit business; but after some years it would be apparent either that the company was right or that it was wrong. In either case the bonus-earning power of the branch might well be significantly out of line with that of local companies. It seemed to him that the resulting profit or loss properly belonged to the company as a whole and not to the particular branch.

Whether or not branch bonuses were based on branch profits radically affected the functions of the branch manager. Without differentiation of branch bonuses, his main responsibility, apart from local administration, was integration of the practices of his company as a whole with those of the insurance industry in his territory. As the senior official in his territory he had a special responsibility for the interests of local policyholders. If branch bonuses depended on branch profits, he was more in the position of the manager of a local independent company which had the objective of maximizing local bonus earnings with due regard to the safety of the local position. For that purpose a larger local management became necessary, and it might even be found that a local board with considerable independence was desirable, which would dissipate the strength of the company as a whole. He thought it probable that a greater total profit could be obtained in the long run by attempting to maximize the profits and security of the company as a whole than by subdividing the company into branches and aiming for maximum profits and security in each branch.

It might be thought that he had been advocating close control by the chief office over the branches in a world company. In so far as detailed control was concerned, nothing could be further from his intention. In an overseas business of any kind it was essential to delegate administrative control of detail to local officials. It was only in more general matters that over-all control seemed desirable, and even in that great weight should be given to the advice of the man with the most detailed and up-to-date knowledge of the background of the branch—the branch manager—who was under the physical handicap of having to present his views in letters, and who, when differences of opinion arose, could not usually join in discussions which would lead to the resolution of those differences.

**Mr W. E. H. Hickox** believed it was fundamentally sound that, after the initial costs of establishment had been met, each overseas territory should so far as possible stand on its own feet, with premium bases and bonus declarations peculiar to its own experience. He had used the words 'so far as possible' because he agreed with Mr Dicken and Mr Rolph that random fluctuations arising from the smallness of the branch or from the underwriting of policies above the retention limits which the branch would have accepted as a separate entity should be borne by the company as a whole.

The overseas branch had to compete in the local market, and could do that properly only if it paid full regard to local traditions and operated in the same way as a local company, without being tied unduly to over-all policy. In some countries policies were sold mainly on premium rates and the rate of bonus counted for relatively little. In other countries the bonus rate was of paramount importance and it might be necessary, in order to compete, to declare bonuses close to the full level of the surplus earned, subject only to the necessity of reserving sufficient strength and being sufficiently cautious, so as not to have to reduce bonus rates unless conditions deteriorated to an extent which made it possible to demonstrate that that was equitable and where the local companies would almost certainly have to take similar action. Then again, as had happened in Australia, the local tradition might change and companies start a new bonus series with lower premium and bonus rates—a process which the overseas branch might have to follow if it were to compete.

Overseas branches had, he thought, one major advantage and one major disadvantage in comparison with local companies. The advantage was that in general they had the guarantee of the parent company, even though that might not be absolute, in return for which they should make transfers to the central fund. The disadvantage was that they were normally 'younger' and therefore more susceptible to variations in interest and mortality than local companies, so that they had to be just that much more cautious in their bonus declarations.

From the purely actuarial angle, the youth of the business might, however, have an interesting advantage. While the position might vary between different offices and branches, it would often be found that the mean duration of the investments was roughly such that the vulnerability of the rate of bonus to changes in interest rates was for existing business similar to that for new business, so that from the point of view of equity as between different generations of policyholders exactly the same rates of future reversionary bonus would be earned by both existing and new policyholders. For that position to arise the mean term of the assets had to be about midway between paid-up immunization and zero immunization, which could be seen from the paper by comparing a level £1 18s. 4d. throughout with the figures in the first table in § 4.13.

The explanation of that could be reasoned as follows. The midway position between paid-up immunization and cash was equivalent to holding investments from which the asset income was receivable half way to policy maturity, or was spread evenly over the future duration in force. The reserve value of a policy, exclusive of bonus, could be expressed as  $(P_{x+t \overline{n-i}} - P_{x\overline{n}}) \ddot{a}_{x+t \overline{n-i}}$ . If then the investments were spread evenly over the future premium-paying period an asset income of  $P_{x+t \overline{n-i}} - P_{x\overline{n}}$  would emerge each year, which would have the effect of increasing the premiums as they were received for investment each year from  $P_{x\overline{n}}$  to  $P_{x+t \overline{n-i}}$ . In consequence of that, a policy effected  $t$  years ago at age  $x$  and maturing at age  $x+n$  would be brought into the position of a new policy for the same sum assured and maturity age to be

issued at age  $x+t$ . That, he admitted, was not completely scientific, because the vulnerability of bonuses to interest rates varied to some extent with age and duration at entry, and existing bonuses also had to be considered. It provided, however, a broad picture to show that the same uniform rates of bonus were likely to be earned by new and existing policies if the mean term of the asset income was about half way to maturity.

The author's stabilized interest rate was based on an estimate of the average future rate of interest to be earned. The latter was almost as subjective a quantity as the stabilized interest rate itself. Presumably by the average future interest rate the author meant the average rate over the future term of existing business, but even so allowance had to be made for trends which were, to say the least, problematical. The estimate was, however, well worth while making; and, when it was made, the bonus emerging could be compared with the uniform rate of reversionary bonus which new business premium rates were estimated to provide on the assumed future interest rates. In that way they would be assessing the target rate of bonus at which new business could be said to aim, and bonus declarations should then be made with the prospect clearly in mind of eventually building up or coming down to that target rate.

**Mr F. M. Redington** wished first to illustrate a point raised by Mr Perks and Mr Hickox. About 2 years earlier his office had looked at the matching position of one of its larger overseas branches. The branch had been in existence for more than 20 years and had developed well, with increasing activity in the post-war years. The average age of the business in force had been perhaps 5 or 6 years. The assets had been invested fairly long—as long as local opportunities allowed, although not long by standards in Britain. Nevertheless, the sensitivity of the bonus-earning power of the existing business to a change in the rate of interest had been greater than that of new business. For example, if a  $\frac{1}{2}\%$  rise in the rate of interest increased the bonus-earning power of the new business premiums by the 8s. 4d. envisaged in § 4.13, that same rise of  $\frac{1}{2}\%$  would have increased the bonus-earning power of the existing business by about 10s.

It seemed almost impossible that that could happen, but the reason was a purely mathematical one. Interest was not a big factor in the earlier years of a policy's duration, but came in with growing weight as the business got older. In spite of their efforts in that territory and in many others, policies were for such long terms and the available assets were of such short terms that any form of matching was impossible. In the case in question their assets had been only a third of the way between zero asset duration and paid-up immunization. He mentioned that partly as a curiosity, but also as a warning that new operations in many of the overseas territories were exposed to the effects of varying interest rates. It was one of the main problems of an overseas branch.

Turning to another point, he said that when in Rome they could not ignore what Rome did but it did not follow that it was always best to do what Rome did—or when in England to do what England did. It was strange to find other countries often acting in a way which by long tradition and unspoken agreement had been regarded in Britain as unsound, and it was even more peculiar to find that some things habitually done in Britain filled other countries with righteous indignation.

When they started a new overseas branch they naturally and properly set up separate accounts. It was safe to say that for many years those accounts would

compare badly with those of the whole company. How far were those depressing accounts to be the mainspring of action? The answer was 'only partially'. It was necessary to distinguish between those aspects of the overseas branch which truly needed separate treatment because it was overseas and those which only appeared to do so because separate accounts were kept between overseas expansion and general expansion.

If any well-established British office started a new branch in Holborn and kept separate accounts for the business of that branch, the outcome was inevitable. There would be substantial establishment charges such as rent, rates, furniture, equipment, and salaries, which were not immediately covered by production. Further, the office would set up liability reserves for the Holborn branch business on its traditional cautious basis and declare bonuses, which had been in no way earned, on its ordinary liberal level. The branch would show a deficit for very many years, and perhaps for ever if it were of late formation. The answers to the problem in the case of Holborn were obvious. The establishment charges which were incurred were the sinking of part of the company's estate in a new and valid item of goodwill. The valuation losses were the sinking of part of the company's free estate in the strong valuation basis of the Holborn liabilities. It was as wrong to overlook the need of separate accounts for a Canadian branch as it was stupid to ignore the fact that the main picture disclosed by them would be similar to that disclosed by a Holborn branch.

In his conclusion the author was a little over-candid in admitting that the conceptions of the paper lent themselves to a separatist view of overseas business. The author did envisage separate premiums and bonuses and allowed for separate mortality, interest and so on, but underneath it all he recognized the Holborn parallel and that the initial outflow from the home country was not lost to the country or to the company's home policyholders, but was estate sunk in a great investment overseas. It was a matter of vital importance that the Indian Government, on the disinterested advice of their actuaries and other insurance officials, had been big enough to appreciate the Holborn argument and to recognize it in the excess asset claim provisions included in their nationalization legislation of 1956.

In considering the problems of overseas branches the analogy of a child in the family had often been used. He believed that that was a real and vital analogy which reflected an underlying truth. Sometimes it led to the answer to a difficult basic problem more surely than elaborate calculations. He believed it gave the answer to the basic question in the paper, namely, how far a separatist view should be taken of overseas business. To quote uniform premiums and bonuses was comparable to putting the children in uniform clothes and making them play uniform games. The essence of the family spirit was that the young should be nurtured and developed under the wing of the older members. The author's exposition completely preserved that essence, since the branches were financially supported until they were fully grown; after that they took their place side by side with the other adult members. The family spirit was in no way weakened by having separate bonuses and separate premiums. It was to be noted, too, that the line of development outlined by the author was fundamentally different from the principle of founding subsidiary companies, where the concept of the family was largely abandoned. The analogy brought with it its own warning note—it was dangerous to have more children than could really be afforded.



**Mr D. M. Patton** said that several reasons had been suggested why United Kingdom offices should do business abroad. The most valid, he thought, was the prospect of greater profit for the shareholders, but that did not seem to benefit the policyholder. The suggestion was made that the policyholders might benefit in the long run, but the author had made the comment that it was undesirable to credit assets to overseas branches to such an extent as to deprive United Kingdom policyholders of an appropriate return from their policies. What was meant by 'appropriate'? Surely it was appropriate that all the profits made on home business should be returned to the home policyholders, after the shareholders, if any, had had their part? Was it appropriate to give United Kingdom policyholders a lower bonus in order to be able to set up a branch in one of the Dominions? If it would be possible to give home policyholders a bigger bonus at some time in the future as the result of that expansion overseas, that would be an answer; but if the bonuses to policyholders overseas were to be decided on the basis of the surplus earnings of overseas branches it was difficult to see how United Kingdom policyholders could ever gain. Admittedly there was the suggestion that the initial capital sunk in the overseas branch could be brought back subsequently, but in the meantime it had lost a good deal of interest.

**Mr J. Hamilton-Jones**, in closing the discussion, said that one function of Institute papers was to guide the thoughts of those concerned with the practical side of actuarial work into a fresh consideration of fundamentals. To some extent the author's paper followed tradition, but there was in his mind, and he thought in the minds of many others, a link between papers on overseas business and a campaign for recruiting new offices to do business overseas. It was noteworthy that in the discussion on Gardner's paper the then President had referred to the implied invitation to stay-at-home offices to try their hand abroad. With that in mind, what were they to make of a paper which appeared at a time of unprecedented difficulties for British offices overseas, such as had been caused by the nationalization of life assurance in India? His answer would be that for its broadening effect on all concerned overseas business was still greatly worth while, and materially his feeling was that the rewards had, on balance, outweighed the disadvantages.

From the opening paragraph of the paper, it might be thought that more offices were going into overseas territories and that more territories were being entered. He felt that much of the increase referred to in that paragraph might be due to a rapid growth in the business of a few offices, long established in certain favourable areas. Potential development overseas was still great, and there was evidence of continued optimism amongst offices and amongst individual actuaries.

The opener had rightly emphasized the movement towards self-contained overseas branches. The paper touched on many points which the actuary was called on to consider, but there were others of equal importance that could be mentioned. The first concerned expense, a factor which varied appreciably between countries, especially in its relationship to agency systems. Few territories were without a well-organized system of agency activity and remuneration, and it was, he felt, a fundamental necessity that an office should in each territory be so placed as to make the maximum use of local selling ability. Intimately bound up with the problem of selling was that of avoiding early lapses. In his view there were certain countries in which the wastage was

so high that a British office might well hesitate to operate there. On the other hand, in contrast to the general picture given in § 2.8 it might be found that there was no local office at all in some small markets, and it was just conceivable that an office could name its own conditions for local representation.

Mr Perks had mentioned the problem of other establishment costs. Those were of a managerial rather than an actuarial nature, but so far as the agency side was concerned the loadings in the premiums were probably a specific item of which the actuary should study the background. Another important point which might be mentioned was the effect of the obligation in some territories to guarantee surrender values on the miscellaneous profits normally available to swell bonuses.

As stated in § 4.7 it was true that the liabilities would often be of long term, even measured by British standards, but even when dealing with areas where endowment assurances were as popular as they were at home, the term of otherwise suitable investments would be too short for matching. The development of the very short position in the example given in § 4.13, even allowing for the arbitrariness of a model office, was probably impossible. That might have been more obvious if the author had also shown the figures corresponding to a decrease of  $\frac{1}{2}\%$ . In practice the actuary would watch a situation such as that envisaged for only a short period, and, if the trends illustrated had established themselves, he would in equity be bound to change his premium scales for with-profit business. In that connexion Mr Perks had referred to Canada and made some remarks with which he found himself in some agreement.

There were two other factors worth mentioning. One was that overseas markets survived and flourished in spite of the unmatched position, even by Mr Hickox's standards. That was probably due in no small measure to the way in which Government action would protect the soundly managed local companies in the event of difficulties. The actuary should therefore study the history of interest rates in the territory concerned, and the role of the Government concerning those rates, and should pay particular attention to the methods by which assets were valued by local companies, which might not correspond with British practice. Mortgages still played an important part in some territories and information should be obtained concerning them.

It had been his privilege to meet in their offices a number of actuaries and others, representing British offices overseas. He could say without hesitation that, whatever might be argued theoretically, those overseas representatives were nearly all thoroughly integrated with the market on the spot. In human terms it was, as had been stated, frustrating to be jerked by a tight rein from head office, and it would be unrewarding to see too many of the fruits of their labours swallowed by a central fund.

The author had made the case for the individual treatment of each branch. It would be possible to accept the methods suggested by one or two speakers of averaging over the branches, and most people would heed the strong reservations which Mr Redington had made. Broadly speaking, however, it might be said that those who in Britain stood *in loco parentis* should take a pride in the healthy difference between their charges.

**The President (Mr C. F. Wood)** said that with the development of overseas trade which had taken place during the last century it was understandable that life assurance companies should have been called upon to issue policies to the men who represented British firms in other countries. From that it had been

a short step to the sale of policies to the local inhabitants, where they had been considered to be insurable. In that period currencies had been stable and freely convertible, taxation had been low or non-existent, and legislative restrictions controlling life assurance had been rare. The greatest problem for the actuary had been the estimation of the mortality likely to be experienced and its control through careful selection of agents and medical examiners and through efficient underwriting. The additional mortality had usually been covered by an arbitrary extra premium, and the policies had otherwise been subject to the same terms and conditions as policies issued in the United Kingdom, with-profit policies receiving the same bonuses as all other policies issued by the company. Freedom of currency exchange had made it seem not essential to cover the liabilities with assets of the same currency, and the funds of the companies had usually been invested in Britain, where they could be supervised by the head office.

As business expanded, branches had been established, and the methods of conducting business had had to be modified from time to time from those of the country of origin, in consequence of the requirements of local life assurance legislation. The growth of taxation on different principles from those in the United Kingdom, the imposition of regulations affecting valuation of assets and liabilities and the restriction of freedom of action in the investment of funds and their movement from one currency to another had brought special problems for the actuary.

In proposing a vote of thanks to the author for his interesting and instructive paper, he said that it had provided a stimulating discussion which he hoped Mr Skerman felt was compensation for the many hours of work that he must have undertaken in its preparation.

**Mr R. S. Skerman**, in reply, said that the main point of the discussion—and quite rightly, because it was a fundamental one—was what to pool and what not to pool. He was grateful to Mr Redington for expressing what he meant on that point more clearly than he had done himself. In the light of that clarification, he thought that the difference between himself and other speakers was perhaps smaller than they had felt it to be. The line of reasoning which had led him to the conclusions which he had expressed had not been of his choosing, but had been forced on him as a result of experience.

Mr Purchase advocated the pooling of what he called normal profits, but accepted the fact that differential bonus rates were justifiable to reflect other than normal profits, which he regarded as those resulting from Government action. Other speakers had expressed somewhat similar views. While he respected the philosophy underlying that approach, the problems which it posed were formidable. There was a good deal of Government control of interest rates. If in a given territory interest rates were out of sympathy with those in other territories, was the consequence of that to be deemed a normal or an abnormal profit? The attempt to keep with-profit premium rates in line in the various territories could succeed to a limited extent only, and it had to be remembered that every change made in with-profit premiums produced inequity out of all proportion to that produced by a change in bonus and might involve policy diverging from that of local competitors, which could raise major problems.

Those comments also applied to the remarks of Mr Madders, in reply to whose suggestion that the branch management should apply themselves to developing the branch business and be relieved of all responsibility for such matters as bonus declarations, he expressed the opinion that one of the most

salutary ways of ensuring the efficient management of any business was for the management to know that the consequences of their actions, favourable or unfavourable, would come home to roost. That was one powerful reason for limiting the pooling of results.

He agreed generally with the remarks of Mr Rolph and felt that he should have stated in the paper that he was not seeking to isolate the mortality experience in each territory on a year-to-year basis, and he was willing to envisage a reasonable pooling of that. He agreed that his remarks about non-profit policies should have been limited to those with large reserves.

The paper, as Mr Dicken had rightly pointed out, did not apply to small branches. His definition of the business under discussion in § 1.3 was complicated as it stood, but he should have made it clear that he was dealing only with large branches.

As Mr Perks stated he had, in taking figures from the paper by Bayley and Perks, amended the figures for year 0; he had permitted himself that licence but thought it was justified by the added insight which the amended figures gave into the position. He agreed that the estate could be a misleading conception unless linked with the question of how much of it would remain if the rate of interest varied.

He was grateful to Miss Allanach for her comments on some of the problems involved in the transfer of policyholders from one territory to another. They were entitled to expect service in those circumstances, and it was the duty of an office operating in several territories to accept an obligation to devise satisfactory facilities.

He fully agreed with Mr Wheeler that the worldwide guarantee of policies could be interfered with by external factors beyond the control of the office, but the fundamental point which he had wanted to make was that the office should be willing to give and implement that guarantee so far as it could.

Mr Patton raised the question of United Kingdom policyholders getting their money back. It was important not to deprive them of an adequate return while overseas business was developing, but later on it was to be hoped that they would gain advantages from the fact that the office operated overseas. That was one of the objects of doing the business.

To the extent to which the paper had merited praise, it was a demonstration of the value of the pooling of the ideas of those who, with himself, had been concerned with the development of the overseas business of an office. His doubts about pooling did not extend to the pooling of ideas, and he had no hesitation in accepting the praise which had been offered on behalf of all those who had contributed to the paper.

The following communications have also been received:

**Mr D. H. Gill.** The point was made in the discussion that the development in overseas life business has been largely made by the few offices who have well established overseas branches. The actual position is that although there were forty-five offices out of ninety-six who received premiums from overseas during 1954, only seventeen offices had an overseas revenue premium income of £100,000 or over. The total overseas premium income of this group of offices amounted to £33.7 million, being 98 % of the grand total for all offices. Further, this total was over six times the corresponding figure in 1935, whereas the overseas premium income of the remaining offices shrank by nearly 50 % of the 1935 figure over the 20 years from 1935 to 1954.

Another point that emerged was the general feeling that the scope for overseas life business is mainly confined to the countries within the British Commonwealth. This is confirmed by the 1954 figures. I have been able to trace about 83 % of the total overseas premium income in the various overseas governmental returns and this was made up of 40 % from Canada, 20 % from the Union of South Africa and Southern Rhodesia, 11 % from Australia and New Zealand and 12 % from India and Pakistan.

**Mr S. C. Damle.** The author has followed up the theory of immunization propounded by Redington and has set out in some detail the technique and procedure which could be adopted in the case of the foreign business of an insurer by suitably using the technique of the 'estate' given by Redington. The method suggested by the author no doubt secures the necessary autonomy so much desired by the foreign branches while maintaining the security of the office enjoyed by all policyholders. But in spite of a fairly detailed exposition of his method the author is aware of those important intangible factors which cannot be reduced to figures. Although the author explained that a wide variety of bases may be employed for the taxation of overseas life assurance business, in the Appendix he has assumed *T*, the tax charged in respect of branch business, to be entirely chargeable against interest income on the book value of the assets which are in branch currency. Where exchange restrictions present an insuperable difficulty the author's method may perhaps be the only one which may be considered suitable.

Ignoring the complications introduced by exchange restrictions, I feel that the author's method is more complicated than one would desire and of restricted utility where a new branch has to be opened and limitation of expenses as a proportion of the premiums is operative. Although all policies, under the author's suggestions, enjoy the security of the office as a whole, there is not sufficient averaging of the risks as between the home policyholders and overseas policyholders of the same insurer. I suggest that the premiums need not be based entirely upon the likely experience of the branch concerned, but may also partly reflect the experience of the insurer as a whole. I would indeed suggest that the head office may re-insure a portion of its home business with a branch and also take a certain part of the branch's business by re-insurance with the head office. The adoption of the re-insurance technique can suitably accomplish the object of local autonomy as well as the necessary averaging of the risks. Being a branch of a particular office the guarantee against insolvency is presumed as a natural consequence as also the share of the head office in the surplus of the branch. If by re-insurances the head office maintains a certain minimum amount of business in force in a branch, it will assist the branch in effecting economies in expenditure and facilitate the working of a new branch in its early stages.

If, however, complications arising from currency restrictions are felt to be insuperable I would probably regard the state of affairs as unsatisfactory and it may not be advisable to have a branch in such a territory. In the long run, however, it may be possible to arrive at some stable arrangements, maybe through the International Monetary Fund, and in that case it may work out satisfactorily.

It appears that the question of selection has not been considered in the paper. Even in moderately developed insurance markets where the total proportion of life business written in a year going to branches of foreign insurers

is relatively small, the foreign branches on account of this very cause may be in a position to exercise a high degree of selection both in the choice of their risks as well as in their investments subject, however, to such restrictions as may exist.

**Mr A. M. Pearson.** §§ 2.3 and 3.2 clearly set out one of the difficulties of overseas business. Each country tends more and more to demand security for the local policyholders, so that the ultimate effect of the guarantee of the office as a whole for all policies means that the home business guarantees the overseas business without any corresponding return guarantee. Most, if not all, offices transacting life business abroad can stand this, because their home business is so much greater than all the overseas business put together, but it is a point requiring careful consideration and, at times, a limit being placed on the amount the office is prepared to write in any year in any overseas country.

I am glad that Mr Skerman recognizes the fact that since the office overseas will be competing with local companies, it is necessary for premiums to be determined by local conditions and also that it may be difficult, *ceteris paribus*, to sell participating policies with a high rate of bonus and higher than average premiums. In my experience, some British actuaries do not recognize this, insisting that all participating policies should receive the same rate of reversionary bonus wherever the policy is issued. On the other hand, other offices that use the reversionary bonus at home, declare bonuses abroad in the form usually adopted in the particular country, where, perhaps, a uniform cash bonus is generally declared. I do not consider one should go as far as this, but I do agree with Mr Skerman that bonus rates should not necessarily be constant throughout the world.

The tendency today in some countries is almost to force foreign (i.e. British and other) offices to form their branch into what amounts to a local company and for that reason the 'ear-marking' of assets must be maintained purely privately wherever possible. When it becomes impossible, in my opinion the time has come to consider the cessation of new business in that country.

As regards valuation bases, I had a case where a foreign authority refused to accept a new valuation basis of an English company for its business in that country, on a modified net premium basis and A 1924-29, on the ground that the net premiums resulting were so low that later, once the valuation basis was accepted, the office could submit new office premiums that the authority could not refuse, but which would be so much lower than those charged by any other company that the English one would get all the business. I could get the new basis accepted only by showing it gave very similar results to the old O<sup>M</sup> 3% net premium basis and the authority only accepted it with the proviso that the old net premiums were those that applied to office rates.

**Mr Skerman** has since written as follows:

In amplification of my statement that the paper was not intended to apply to small branches, I agree with Mr Dicken that the analysis outlined therein as a guide to the rates of bonus to be declared is unlikely to be justifiable for a branch where the total net liability is less than £1,000,000.

It is, I think, impossible to give a precise answer to Mr Patton's question regarding the interests of United Kingdom policyholders. When in § 4.4 I made reference to an appropriate return on such policies, I had in mind a return which reasonably reflected the experience of the office in the United Kingdom. It is

tempting to say that an appropriate return would be that which would have been obtained by United Kingdom policyholders if the office had never commenced operations overseas, but if these operations are substantial there are no means of determining this figure closely. One can do no more than endeavour broadly to give United Kingdom policyholders value for money while overseas business is passing through its development stage, in the expectation that as it becomes more mature, they will be the gainers.

As Mr Hamilton-Jones suggests, the very short position in the example in § 4·13 is probably impossible. I indicated that the example was intended to be theoretical rather than practical. Nevertheless, as several speakers mentioned, a position can arise in practice sufficiently close to that illustrated in the example to give rise to unusual problems. In my opinion, the most equitable manner of dealing with such a situation is to allow it to be reflected in the bonus rates determined, as outlined in § 4·14. Mr Hamilton-Jones suggests that if a permanent reduction of  $\frac{1}{2}\%$  occurred in the rate of interest, the actuary would in equity increase the with-profit premium rates. I agree that such action might well be taken and that there are good reasons for taking it, but I do not think that it can be regarded as more than a desirable expedient—it does not commend itself to me as being the most equitable course of action.

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# ERRATUM

In *J.I.A.* Vol. 83, p. 81, para. 4·13, line 3,  
*for* page 10 *read* page 82