

## SOME THOUGHTS ON ANNUITY BUSINESS

by

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WHEN closing the discussion on the Finance Act, 1956, at the Sessional Meeting held at the Institute in November 1956, A. G. Simons commented that the Act would take a little while to settle down and really be appreciated, and it was a pity, therefore, that some of the younger members of the Institute had not given their views, because they were the ones who would have to handle it in the future.

If the thoughts expressed in this paper encourage a lively discussion amongst the younger members then it will have achieved its object.

### BEFORE THE FINANCE ACT 1956

#### *(a) Taxation*

Taxation of life annuity business was such that a combination of deferred and vested annuities resulted in less tax being paid than if the deferred and vested annuities had been taxed as separate funds.

In the simple case of a fund consisting of vested annuities only, with no foreign business and no investments involving a 'net United Kingdom rate of tax', the Inland Revenue received tax:

- (i) On the investment income; deducted at source at the standard rate.
- (ii) Equal to the excess over (i) above of the tax withheld by the Office, at rates of tax varying according to the individual circumstances of annuitants. If tax withheld was less than (i) above the Revenue refunded the difference to the Office.
- (iii) On the valuation surplus and profits (less losses) on realized investments at the rate of 7s. 6d. in the pound. This tax was

paid indirectly through the claim for relief on management expenses. Valuation surplus was net of sums reserved for annuitants and finally net of expenses of annuity business.

The Inland Revenue thus received tax on the return of capital and interest which went to make up the payments to annuitants at an average rate dependent on their individual circumstances, in addition to tax at the 'pegged' rate of 7*s.* 6*d.* on valuation surplus and profit from realized investments. The valuation surplus consisted of profits or losses from interest, expenses and mortality. Surplus would not emerge in the same way as true profits unless the valuation basis was identical in all respects with the basis of premium rates, but in the long run accumulated surplus would equal accumulated true profits. Tax paid by the Office was, therefore, on profit interest, profit from expenses and also tax on all capital profits both from investments and from annuitants (the latter being the profits from excess mortality over that assumed in the premium basis).

In the case of an annuity fund consisting only of deferred annuities, the Office paid tax at the 'pegged' rate on the investment income less the expenses of the business. A notional loss, equal to the net investment income less the sum of the surplus, net expenses and profits from realized investments, was carried forward. Net investment income and net expenses mean investment income and expenses after deduction of tax at the 'pegged' rate. Surplus means the valuation surplus obtained from a Revenue Account which includes net investment income and net expenses.

In an annuity fund including both deferred and vested annuities, where the gross annuity payments exceeded the gross investment income, tax was paid as described for the vested annuity fund. The combination of the two classes resulted in a relief from tax in respect of the deferred annuity business, equal to 7*s.* 6*d.* in the pound on the excess of the investment income arising from the proportion of the fund relating to the deferred annuities over the similar proportions of expenses plus valuation surplus plus profit from realized investments.

Where a combination of the two classes resulted in the gross

investment income exceeding the sum of the gross annuities paid, expenses, surplus and profits from realized investments, then the Inland Revenue received tax:

- (i) From the Office; at the rate of 7s. 6d. in the pound on the gross investment income less the sum of the gross annuities paid and expenses.
- (ii) From the annuitants; tax withheld by the Office on the annuity payments at rates applicable to their individual circumstances.

This combination produced tax relief on the proportion of the fund applicable to deferred annuities at 7s. 6d. in the pound on the sum of (a) gross annuities paid and, (b) the proportions of expenses, valuation surplus and profits from realized investments, less gross investment income, in respect of the proportion of the fund relating to vested annuities. Unless the relief from tax was passed on to the annuitants by being brought into account in the assessment of premiums or by way of bonuses, then it would have increased the amount of valuation surplus and so been taxed.

The 'pegged' rate applicable to Life Assurance business at 7s. 6d. in the pound mentioned would have been the rate of tax from 1940 onwards. Prior to 1940 the standard rate of tax to be used in the calculations was less than 7s. 6d. in the pound.

#### (b) *Premium rates*

In the case of a fund consisting entirely of vested annuities, gross interest and gross expenses would be assumed when calculating premiums for immediate annuities. In the hypothetical case of a fund, in which there were no vested annuities and all new and existing deferred annuities vested on the same day, premiums would have been calculated assuming net interest and net expenses in the deferred period and, in most cases, net expenses also after the vesting date.

From 1940 'net' rates of interest and expense were equal to the gross rates less tax at 7s. 6d. in the pound.

Net expenses after vesting date were justified when the expected notional profits after that date never exceeded the expected total notional losses in the deferred period. The following formulae may

be obtained if it is assumed that premium rate basis, valuation basis and experience all coincide:

Office annual premium for a deferred annuity of one per annum payable annually in arrear, without return, age  $x$  at entry =  $P$

Loading for expenses on annuity payments (net or gross as the case may be) =  $g$

Age at vesting date =  $y$

Deferred period =  $n$  years

Expected total notional losses at the vesting date =  ${}_n p_x (1+g) a_y - P \ddot{e}_{x:\overline{n}}$

Expected notional profits at the vesting date =  $g e_y$

By segregating the two types of annuity business, the formulae to give the maximum premium rates for each class could be obtained. The problem then arose of how to deal with the relief of tax obtained on the deferred annuity business by combining with vested annuities.

G. V. Bayley, in his paper in *J.S.S.* 10, outlined a method of calculating premiums which involved an estimation of the future tax position of the annuity account. In a particular year, if a Type A Revenue Account was likely, then he gave all the tax relief to those whose annuities had not then vested, whereas, if a Type C was likely, then all the relief was given to those whose annuities had vested. Apart from charging deferred annuitants, in some instances, gross expenses rather than net in respect of the cost of making annuity payments, no one was charged a higher premium than that applicable to his class of business had there been no combination. On the other hand, it was possible for the degree of benefit to vary considerably and a particular annuitant might have received no relief at all.

The unsatisfactory feature of Bayley's method was the all or nothing element in the allocation of the tax saved. His assumptions might have resulted in very competitive rates of premium in one class attracting an unexpected volume of business which would then change the balance between deferred and vested annuities and so affect the future tax assumptions.

Some system of participation, both for deferred and vested annuities, might have been a solution. An attempt might have

been made to overcome some of the features of taxation of annuities which were considered unjust. It is generally considered that the principle of taxing interest on invested capital was fair, but not taxing the repayment of the capital itself. Net interest in the deferred period, but tax only on the interest portion of each annuity payment, would generally have been accepted as a fair basis for annuities purchased other than through pension schemes. The position was reversed for pension schemes where it was considered that the fund should not be taxed but that the whole of the pension should.

Life annuity business arose from three main classes:

- (i) Immediate and deferred annuities purchased by individuals from taxed income or capital.
- (ii) Staff pensions purchased by deferred annuities.
- (iii) Immediate annuities purchased by employers as pensions to employees under the 'Hancock' rule or by maturing Group Endowment Assurances.

Class (i) was probably a Type A case when considered alone, class (ii) a Type C, and class (iii) a Type A.

Class (ii) consisted of a number of individual schemes, each of which could have been regarded as a separate fund. The degree of tax relief arising within an individual fund would have depended on the proportion of vested pensions. Might it not have been justified that, an individual scheme being a fund of Type A, the employer should have received a rebate of premiums if they had been assessed on the assumption that investment income was subject to tax in the deferred period?

In recent years Offices have introduced schemes on a with profits basis and a number of actuarial papers on the subject have been discussed. The distribution of tax relief has not been disclosed, but it is unlikely that the tax position of the fund applicable to an individual scheme has any bearing on bonuses at present. It would not be easy to devise a practical system on a sound equitable basis. Apart from the work involved in considering each scheme as a separate fund, there is the tax relief arising from the combination of the three classes, mentioned above, to be distributed.

An examination of rates of premium for immediate annuities charged by Offices offering reasonably competitive terms since 1946 indicated that a rate of interest higher than the yield obtained on immediate investment was assumed if due regard was made to improving mortality of annuitants. In 1946 the rate of interest varied between 4% and 4½%. During the next few years there were small increases in rates of premium, but by 1956 premiums had reduced and the prevailing competitive rate of interest assumed was 5%. It seems fairly conclusive that some Offices were passing on some of the relief from tax to purchasers of immediate annuities by assuming a higher rate of interest than that justified by investment alone. A number of Offices having a large volume of deferred annuities were amongst those offering competitive terms.

The rate of interest assumed in the calculation of premiums for non-participating Group deferred annuities fell gradually from 4¼% to 3¼% in the years before the last war. Soon after the war began the rate fell generally to 3% where, for many Offices, it remained until the beginning of 1956, apart from a short period in 1947-48 when it was 2½%. The Life tables used were the A 1924-29 ultimate before retirement and *a(m)* and *a(f)* ultimate thereafter. Improvement in mortality rates amongst pensioners was recognized by some Offices at the end of 1948 by assuming an age at retirement lower than the actual age.

The effect of taxation in the deferred period was largely ignored for much of the period before the last war and the degree of its inclusion since is not easily seen. Tables 1 and 2 compare net single premiums, without return, according to various rates of interest for a pension of one per annum, payable to a male, monthly in advance from age 65, guaranteed payable for a minimum period of 5 years. The life tables are the A 1924-29 ultimate before age 65 and *a(m)* ultimate thereafter; Table 1 without adjustment and Table 2 with a deduction of 2 years from the actual age at retirement.

Rates of interest

Basis A	3% throughout
Basis B	2% to age 65, 3.2% thereafter
Basis C	2½% to age 65, 3.6% thereafter
Basis D	2½% to age 65, 4% thereafter

Table 1. *Net single premiums*

Age (years)	A	B	C	D
20	2·03	3·10	2·70	2·35
30	2·79	3·87	3·45	3·08
40	3·86	4·85	4·44	4·06
50	5·46	6·24	5·84	5·47
60	8·28	8·57	8·23	7·90

Table 2. *Net single premiums*

Age (years)	A	B	C	D
20	2·16	3·30	2·87	2·49
30	2·97	4·12	3·67	3·27
40	4·11	5·17	4·71	4·30
50	5·82	6·64	6·21	5·80
60	8·82	9·12	8·74	8·38

The assumptions made in bases B, C and D are net interest in the deferred period and the gross equivalent thereafter (allowing for tax at 7s. 6d. in the pound).

A net rate of 2% was adopted by many Offices in 1947 in the calculation of life assurance premiums. Premium rates were reduced at intervals generally by increasing the net rate of interest by  $\frac{1}{4}$ %. By 1956 a few Offices had adopted  $2\frac{3}{4}$ %.

If the assumptions for life assurance premium rates are taken as a guide to the general view on long-term rates of interest, then an examination of the figures given in Tables 1 and 2 shows that rates of premium for Group-deferred annuities generally were justified only on the basis of some tax relief resulting from a combination of deferred and vested annuities.

At the beginning of 1956 some Offices decided to increase the rate of interest after retirement age from 3% to 4%, although retaining 3% in the deferred period. If the rate after retirement were taken as the long-term view of a gross rate of interest, then the new approach was equivalent to assuming that a rate of tax at 5s. in the pound would be paid in the deferred period. An effective relief, therefore, was assumed at the rate of 2s. 6d. in the pound.

At the same time it was generally felt that a somewhat more stringent basis of mortality in the deferred period was justifiable and a number of Offices based their assumptions for this purpose on the A 1949-52 ultimate table.

It was general practice for many years to guarantee rates of premium for all entrants to a Group Scheme within 5 years from commencement and for all future increments in respect of those entrants. In 1946 a number of Offices decided to reduce this guarantee on new schemes. The right to change rates of premium, any time after the scheme had been in force 3 years, was reserved in respect of both new entrants and increments for existing members.

It was also general practice to guarantee full paid-up pensions and the rates of premium introduced in 1956 gave many Policyholders the opportunity to close down Policies and to effect new schemes, with the same or another Office at a lower cost. Most Offices were prepared to substitute the new rates for those less favourable, at least for the time being.

At the same time there was a feeling that the combination of guaranteed full paid-up pensions and guarantees of premiums was too generous. On new schemes, therefore, some Offices allowed a guarantee of rates in respect of all money paid within a period of either seven or ten years. In some cases, the right to vary rates, after the guaranteed period, in respect of benefits already on the books was restricted, and in others the Office was free to increase rates without limit for all benefits. With the latter type of arrangement full paid-up pensions were generally allowed. An alternative to this practice was the retention of the basis of guarantee of premium rates adopted in 1946, but in this case many Offices restricted the basis of paid-up pensions which they were prepared to guarantee.

### (c) *Valuation*

The rate of interest used in the valuation of vested annuities has, for many years, been lower than that adopted in calculating premium rates. Whereas rates for immediate annuities must have had regard to improved longevity of annuitants, the  $a(m)$  and  $a(f)$  tables have in some instances been adopted for valuation without



adjustment. Even so, new business must have involved a strain which might well have been of the order of 10%–20% of the consideration money. In a Type C case notional losses were increased by this combination of competitive immediate annuity premiums with a more stringent valuation basis. A Type A case might have shown a loss. G. V. Bayley argued in his paper that, since the Inland Revenue accepted the Company's decision on the basis for valuation of liabilities but not its valuation of assets, then the computation of taxable profit seemed divorced from reality. It also seems apparent that the considerable difference between the reserves and consideration money complicated the problem still further, but this time in favour of the Offices.

The valuation of Group-deferred annuities purchased by the 'single premium' method might be criticized on the grounds of some degree of weakness. Where this method of costing is used, it is still common practice to calculate the liability on pensions purchased to date. The liability in respect of guaranteed rates of premium which are less than those calculated according to the valuation basis is ignored. It would generally be accepted that, when valuing business subject to level annual premiums, the present value of 'net' future premiums would be deducted from the present value of the ultimate pensions and subsidiary benefits. The same principle as would normally be applied to life assurance business would justify such a course. The 'net' premium would not exceed a certain proportion of the office premium. 'Single' premium schemes, where rates are guaranteed, are really 'increasing' annual premium schemes, and it is strange that a normally accepted principle of valuation was not applied to this class of business.

When the rate of interest used in the valuation is lower than that assumed in the premium rates, but the assumptions concerning mortality are the same, the additional liability in respect of a pension of one per annum for each year of future service of an employee aged  $x$  could be found as follows:

$$n \frac{D'_{x+n}}{D'_x} a'_{x+n} - (1-c) \sum_{t=0}^{n-1} P(x+t) \frac{D'_{x+t}}{D'_x},$$

where:  $P(x+t)$  is the Office single premium payable at age  $x+t$  to purchase an annuity of one per annum at retirement age  $x+n$ , not returnable on death before age  $x+n$ . Accented symbols are at the valuation rate of interest, others at the rate assumed in the premium rates.  $c$  is the proportion of the Office premium reserved for future expenses and profits.

The expression reduces to the following to enable calculations to be made more readily:

$$n \frac{D'_{x+n}}{D'_x} a'_{x+n} - (1-c)P(x) \ddot{s}''_{\overline{n}|}$$

where  $\ddot{s}''_{\overline{n}|}$  is calculated at a rate of interest such that

$$(1+i'') = (1+i)/(1+i')$$

It can be shown that a reasonable approximation for the additional liability, where premiums are returnable on death before normal retirement date, can be found from the same formula,  $P(x)$  having the same meaning as defined therein.

Where the basis of mortality after pension age used in the valuation is different from that assumed in the premium rates, then  $a'_{x+n}$  would be calculated according to the valuation basis. Where mortality assumptions are different before pension age, then  $D'_{x+n}/D'_x$  would be calculated on the valuation basis. If lighter mortality is assumed in the valuation basis, the approximation would be on the safe side.

The liability in respect of increases in the rate of pension due to salary increases would call for individual judgment and would apply to 'level annual' premium schemes as well as 'single'. The use of salary scales has already been suggested by M. E. Ogborn in the discussion on G. W. Pingstone's paper in *J.I.A.* 77 (p. 369).

#### AFTER THE FINANCE ACT 1956

##### (a) *Taxation*

This Act saw justice done to those purchasing life annuities from capital resources. Provided the Inland Revenue were satisfied that the annuity qualified as a 'purchased life annuity' within the meaning of Section 27 of the Act, then the capital element of each payment would be relieved from tax. In general, the capital

element is found by dividing the consideration money by the appropriate expectation of life obtained from the  $a(55)$  Tables of Annuitants on a select basis. A general principle to follow in special cases is that the purchase money should be divided by a function which in effect is the value of the annuity at a rate of interest of 0%.

Where a contract provides an annuity dependent on life, plus some additional benefit, then the consideration money should be separated and that part applicable to the annuity divided by the appropriate expectation of life. An annuity payable for  $n$  years certain and for life thereafter is an exception to this rule and the whole of the purchase money would be divided by the value of the annuity at 0%.

A special case which results in an interesting feature is the bond which provides for the excess, if any, of the consideration money over annuity payments made to be refunded on the death of the annuitant. The capital element is found by dividing the total consideration by  $e_{[x]}$ . It is noticed that rates offered by some Offices, at the higher ages, per £1 per annum of annuity exceed the values of  $e_{[x]}$  and, therefore, the whole of the annuity payment is regarded as capital. The same feature can occur in a straightforward annuity at higher ages, if mortality assumptions are lighter than the  $a(55)$  rates. It might also be mentioned that, in the case of a bond providing for a payment on death at any time, there being no variation in the sum so payable according to the number of annuity payments made, then the capital element is the total consideration, less the sum to be paid on death, divided by the expectation of life.

The attitude of the Inland Revenue appears to be that the original capital should be relieved of tax rather than that the interest content should be taxed. In the case of a deferred annuity, without return of premiums on death before the vesting date, the capital appreciation arising from survivorship does not escape tax. If the basis of rates and experience coincide, then this appreciation represents the capital loss of those annuitants who died before the vesting date. The taxation of this particular type of annuity still seems to some degree contrary to the normal principles of taxing investment income but not capital profits.

The Act also helped the 'self-employed' and those employees

to whom the benefits of a pension scheme were not available. Within certain limits, full tax relief is now allowed in respect of contributions made for provision of pensions on retirement, on the understanding that the benefits can emerge only in the form of a pension and not as a cash sum, except where death occurs before retirement. Pensions to widows and certain other approved dependants were permissible as benefits, again, within certain limits.

The taxation of the life annuity business of Life Offices was materially changed. In future the business must be divided into two sections: (i) Pension Annuity business, and (ii) General Annuity business. The new type of pension business for the 'self-employed', where the contracts are approved under Section 22 of the Act, together with contracts with trustees or other persons having the management of a superannuation fund approved under Section 32 of the Finance Act, 1921, or Section 379 of the Income Tax Act, 1952, will constitute the Pension Annuity business. The remainder will be the General Annuity business. Annuities purchased by trustees of a pension scheme will need close examination. For example, the trustees of a self-administered '379' fund might wish to reassure part of a large pension and so purchase an immediate annuity from a Life Office, the annuity payments to be made to the trustees; this would be Pension Annuity business.

The income from investments and deposits of so much of the annuity fund as is referable to Pension Annuity business is exempt from income tax under Section 24 (1) (a). However, income arising from investments overseas will not obtain relief from overseas tax paid and full recovery will not be obtainable in respect of dividends subject to a 'net U.K. rate'. Annuities payable from Pension Annuity business are excluded from being allowed as sums 'paid out of profits or gains brought into charge to tax' by Section 24 (1) (b).

By Section 27 (6) the Offices were put in no worse position than before as a result of the relief of the 'capital element' in certain annuities.

The profits arising from both classes of life annuity business will now be taxed separately under Case VI of Schedule D and no longer deducted from the expenses of management re-claim. In

an unusual case, therefore, where annuity profits exceed the management expenses of the life and annuity business, the excess will no longer escape taxation. Normally a loss on one class of annuity business cannot be set off against a profit in the other, but in practice the Inland Revenue are prepared to give special consideration when a 'commercial loss' is suffered by the business of either class. This 'commercial loss' will be obtained by including in the computation the expenses of the business, making no deduction in respect of the excess of taxed investment income over annuities paid, and deducting the cost of bonuses declared on participating annuity contracts.

The 1956 Act made no specific reference to the treatment of annuity profits in relation to Section 427 (2) of the Income Tax Act 1952, namely, 'pegged rate' relief. Taxable annuity profits are found by excluding expenses, and it would have been unfair to tax these notional profits at the standard rate and only allow a relief on the expenses of annuity business at the 'pegged rate'. The Inland Revenue have agreed that, when computing the amount on which relief should be given, management expenses should be reduced by annuity profits, so that in effect taxable annuity profits are taxed at the 'pegged rate'.

The Inland Revenue will not normally accept separate assets for each class of life annuity business. Furthermore, they are generally unwilling to allow those Offices, who have not already done so, to separate for tax purposes the assets relating to combined life and annuity funds. It is difficult to see how the Inland Revenue could object to a physical separation for all purposes made within the terms of the articles of association. A problem arises therefore, from combined assets when current investment yields are different from the average yield on existing assets. This problem becomes emphasized when there is a possibility of a class of business increasing more rapidly than the others. At the present time, an Office might have a comparatively small Pension Annuity business and decide to encourage this class by single premiums. The average yield on existing assets might be 5%, but it would be able to invest new single premiums at a much higher figure. If the scheme were successful and the increase in the Pension Annuity business

proportionately greater than the Life and General Annuity business, then only part of the improved yield on new investments would be allocated to the Pension Annuity business. The remainder would be taxed directly in the allocation of interest to the Life Assurance account and a Type C General Annuity account, but only to the extent that it was included in 'profits' in a Type A case.

(b) *Premium rates*

It is difficult to obtain a clear indication of the basic assumptions made by the Life Offices in the calculation of premiums for contracts approved under Section 22 for the 'self-employed'. Considerable ingenuity has been shown and a wide variation in methods and benefits has emerged, both on a with and a without profits basis. The rate of interest assumed by the majority of Offices for non-participating contracts on a level annual premium basis seems to be either 4% or  $4\frac{1}{4}$ %. The general impression is obtained that a number have assumed that rates of mortality will be between the  $a(55)$  and the  $a(m)$  tables, but no definite conclusion can be drawn without knowing the method and extent of the loading for expenses. It is thought that no more than 10% of the office premiums has been included in the rates for expenses. In some cases a smaller loading has been included, but generally it has been coupled with a rate of interest of 4%. It is more than probable that a margin in the interest has been considered sufficient to cover some expenses. The inclusion of 3% for commission and, say, 1% for the cost of pension payments leaves at the best 6% for management expenses.

It was only to be expected that Life Offices would compete keenly for this new class of business, and whether the non-participating business will prove profitable must be a matter of some conjecture. A rate of interest of  $4\frac{1}{4}$ % is a little less than the gross equivalent of the net rate of  $2\frac{3}{4}$ % now assumed by a number of Offices in the calculation of Life Assurance premium rates. It should not be overlooked that a fall in long-term yields will have a greater financial effect where gross rates of interest are concerned than where net rates apply. The mortality amongst the self-employed after retirement is perhaps the problem which must cause the greatest concern, particularly if reference is made to

R. Ll. Gwilt's comments to the discussion of the 1956 Act published in *J.I.A.* 83 (p. 26). The problem becomes even more complicated when thought is given to the effect of the numerous options which in most instances are open to the policyholder at retirement.

The new Act brought problems of major importance in connexion with Staff Pension Schemes. Reductions in rates of premium, by assuming gross interest in the deferred period, were justified for new '379' schemes. Furthermore, in deference to an undertaking given to the Inland Revenue, similar assumptions were to be made in calculating future premiums on existing '379' schemes. An alternative in the case of participating policies would be to improve rates of future bonuses. There was also a case to be considered for improving existing benefits on schemes classified as Pension Annuity business. If this were agreed, then it would be difficult to refuse to extend similar benefits to schemes, re-arranged to obtain approval under Section 379, which included a transfer in respect of existing benefits. It was certain that some Offices would be justified in increasing existing benefits and it would be difficult for others not to follow, although their particular circumstances might not justify such a course.

The division of annuity business into two classes coupled with large transfers from General Annuity business to Pension Annuity business could materially alter the tax position of the remainder of the General Annuity business. The taxed period in a Type C case would in most circumstances be reduced and might well be eliminated, the position becoming Type A. An Office which had, in the past, accepted immediate annuity business assuming rates of interest higher than those obtainable on investments at that time and had relied on the relief from tax because of a combination of deferred and vested annuities, might be faced with a difficult problem. On the other hand, there might be an advantage where a large notional loss fund was available if future taxable profits were expected.

An Office which had included a generous scale of surrender values in its schemes might find that the re-investment of the cash value at the new rates of premium would produce higher pensions. This would establish a minimum level of benefits.

Rates of premium for past and future benefits in respect of many members who entered schemes before the last war might be lower than the new scale of premiums and there would seem to be no justification for improving pensions so far purchased. Where improved rates are to be allowed for later entrants, it might be argued that the same scale should be used for costing future benefits of the early entrants, but it is likely that the original rates, when more favourable, would continue.

The rates of premium for new schemes and new entrants to old schemes, from 1940 until the beginning of 1956, have already been discussed and apart from a brief period the rate of interest assumed was 3 % throughout. The general view on the level of future rates of interest during the same period was not nearly so constant judging from the frequent changes in life assurance premium rates. A practical solution to the problem of improving existing pensions, however, would be to assume that an average gross rate of interest applied and, in most circumstances, a rate not less than  $3\frac{1}{2}$  % and not more than 4 % would be reasonable. Regard might be taken of the problem previously mentioned concerning the effect on the existing immediate annuity business of the withdrawal of deferred annuities. It is also thought that the more stringent views now held on mortality should be brought into account. An improved pension could therefore be obtained as follows:

- (i) Calculate the present value of a member's pension already purchased according to the assumptions for interest and mortality on which his original premiums were based.
- (ii) Calculate the pension purchased by the value found for (i) according to the mortality assumptions in the new '379' rates and the now decided 'average gross rate of interest'.

The effect of this method can be seen from Table 3, where the special rate basis for calculation (ii) is A 1949-52 ultimate, before retirement age, and the  $a(m)$  ultimate thereafter, with a deduction of 1 year from the actual age throughout and a rate of interest at  $3\frac{1}{2}$  %; the original premiums were calculated according to bases used by some Offices in the periods 1940-47 and 1948-55 as shown in column A of Tables 1 and 2. As before, columns (1), (2) and (4)



refer to net single premiums, without return, for a pension of one per annum to a male life from age 65, payable monthly in advance and guaranteed for five years.

Table 3

Age (years)	Special rates (1)	1940-47 rates (2)	(2) ÷ (1) (3)	1948-55 rates (4)	(4) ÷ (1) (5)
20	1.80	2.03	1.13	2.16	1.20
30	2.57	2.79	1.09	2.97	1.16
40	3.67	3.86	1.05	4.11	1.12
50	5.33	5.46	1.02	5.82	1.09
60	8.24	8.28	1.00	8.82	1.07

To allow the improvement in deferred pensions to be paid as additions to scale pensions would be unfair to those who do not qualify. If, as seems reasonable, no more than the scale pension is paid, the employer would get the benefit of the improved terms by a method similar to that used for self-supporting entrants at young ages. Some spread over would be necessary to avoid a brief but sharp decline in premium income.

The alternative of redistribution of the value of additional pensions amongst all members of a scheme has a serious disadvantage. Take the case of a recent entrant who withdraws and it becomes necessary to pay withdrawal values based on premiums paid by or for him. If some part of those premiums had been allocated for the benefit of another member then a difficult situation would arise. The change in taxation has introduced an element of excess premium payments dependent upon the scale of premiums applicable to individual members and to attempt to grant bonus pensions to all members would require some adjustment to the basis of premium refunds.

It is considered that increases in existing benefits based on valuation reserves will, in many cases, result in an inequitable solution. The valuation basis will often be the same for all schemes, irrespective of the basis on which premiums have been calculated, but the element of 'excess' will depend on the proportion of past premiums paid at more recent high rates. It would seem generous to an unnecessary degree to grant a 'bonus' to an old scheme on the

basis of a valuation reserve which might exceed the value of accumulated premiums and which might have been supplemented from other sources.

The eventual make-up of the General Annuity business, having regard to the proportions of vested and deferred annuities, could not be foretold. It was reasonably certain that not all '388' and similar schemes would be re-arranged and some that were, would leave existing benefits in the old form. Furthermore, there were deferred annuities purchased by individual annuitants, in many instances coupled with annuities certain. It was to be expected in consequence that there was unlikely to be any early change in immediate annuity rates.

The problem was considerably eased by the continued but steady rise in the level of yields on new investment. By the autumn of 1957, with a bank-rate of 7%, many Offices had improved their terms for immediate annuities but it was no longer necessary to rely on a combination with deferred annuities to be competitive. A number of Offices were calculating rates on the basis of the *a(55)* table with interest at 6%. This rate could be justified by the high yields available on immediate investment.

A practice has been introduced of assuming heavier mortality where purchasers are employers buying immediate pensions for retiring employees, or where trustees are reassuring vested pensions under Staff Pension Schemes. It is not uncommon to adjust the normal scale of rates by adding one or more years to the actual age.

It cannot be assumed that no future deferred annuity schemes will be approved under Section 388. There still remain certain advantages, not least of which is that of administration, for the employer of a small staff. It is possible that Type A tax accounts will return. The assumption of a gross rate of interest in the deferred period for 388 schemes, which might seem justified, could bring forth new business in such a volume that all the old problems would re-appear. There is much to be said in favour of participating contracts where refunds to the employer, or bonus pensions, pay particular regard to taxation reliefs.

(c) *Valuation*

The valuation of the Pension Annuity business provides interesting problems, particularly where competitive terms are offered on contracts approved under Section 22. Table 4 shows the new business strain likely to be involved for a level annual premium of £100, where the pension is payable to a male life monthly in advance from age 65, is guaranteed for a minimum period of 5 years, and premiums are returnable with interest on death before age 65. The valuation rate of interest is 4%, and  $7\frac{1}{2}\%$  of future premiums are reserved for expenses and profits. The mortality table, after retirement, is the  $a(55)$  ultimate and in Basis I there is no adjustment but in Basis II there is an addition of 1 year to the actual age.

Table 4

Age at entry (years)	Maximum pension to cause no strain		Strain for each £1 of pension in excess of the maximum	
	Basis I	Basis II	Basis I	Basis II
	£	£	£	£
30	668.3	690.5	2.7	2.6
40	377.8	390.4	4.0	3.8
50	181.6	187.7	5.9	5.7
60	49.1	50.7	8.7	8.4

An examination of premium rates for without-profits policies indicates that most Offices would be involved in some new business strain if they valued on Basis I. In many cases this strain would be a substantial proportion of the first year's premiums.

The valuation of non-participating '379' pension schemes will bring similar problems. Furthermore, a valuation on a basis stronger than that adopted for premium rates raises the question of additional reserves for premium rate guarantees when pensions purchased to date only are valued. Some Offices are using the  $a(m)$  ultimate table after retirement for calculating premiums with a deduction of one year from the actual age of a male life. If it were desired to make similar assumptions for Section 22 business, the results would lie between Bases I and II already given.

The degree of up-grading of existing benefits on '379' schemes and the basis of transfers for rearranged '388' schemes might be such as to result in a release of surplus to take up the strain of new business. A stronger valuation might be made than otherwise would have been possible. Such release would, however, be temporary, and the problem of new business would arise at the next valuation.

It seems reasonable to expect that some Offices might find that there is a notional loss on their tax account and an even greater 'commercial loss' when expenses are included. This is likely even when a valuation rate of interest of 4% is assumed. The Inland Revenue must be satisfied that the basis of valuation is reasonable and their attitude cannot be foretold if large notional and commercial losses are disclosed.

The opportunity might be taken to adopt the  $a(55)$  table for valuation of the vested annuities in the General Annuity business where the  $a(m)$  and  $a(f)$  tables have previously been used. Unless substantial additional reserves have been made for improved mortality by making deductions from actual ages or some other method, then it will probably be necessary to increase the valuation rate of interest if a substantial increase in reserves is to be avoided.

If it is the practice to value all vested annuities on the same basis without regard to their source, there are sound reasons for avoiding either surplus or strain on deferred annuities at the moment the annuity or pension becomes due. Consideration might be given to the valuation of deferred annuities by assuming a lower rate of interest before the date of vesting than afterwards, the effect of tax being confined to the deferred period and a gross rate of interest being used for the valuation of annuities or pensions in possession. The final result might well be that a lower gross rate of interest is possible for the General Annuity business than that for the Pension Annuity business. This is not illogical when it is considered that the reserves available for the General Annuity business will in part have arisen from premiums calculated at lower rates of interest than might be assumed today. The current views on premium rates and the valuation of new business should not necessarily prevail when valuing the existing business. Any strength there may be in

the reserves of the General Annuity business will have been built up from past sources of profit. Furthermore, these reserves will have already been accepted by the Inland Revenue for tax computation purposes. There seems no just reason to weaken the valuation basis merely to maintain an apparent consistency with the Pension Annuity business.

#### VARIABLE ANNUITIES

The following thoughts arise when considering the possibility of transacting this class of business. Controversial matters on whether it is desirable business are not discussed.

##### *(a) Taxation*

A fundamental element of the variable annuity contract is that benefits are payable in a currency, the value of which is determined from the market value of assets held entirely in ordinary shares. The liabilities at the beginning and end of a valuation period, together with income and outgo, will probably be expressed in sterling equivalents in the taxation account. There would, in that case, be an additional source of profit or loss as a result of variations in the rate of 'exchange' during the valuation period.

It would seem essential that this class of business should be kept apart from the normal Life Assurance and Annuity business and should have separate assets. This would avoid unsatisfactory features arising out of the allocation, for taxation purposes, of investment income and profits or losses on realized assets. The investment income of this special class of business is likely to differ materially from time to time from that obtained from the normal business owing to the nature of the assets. Furthermore, fluctuations due to 'exchange' in the value of liabilities will add to unreal allocations if the normal basis of mean net liabilities is adopted.

Profits and losses from the sale of variable annuity assets will be automatically matched by rises and falls in the liabilities. An unreal allocation on a mean net liability basis amongst other assurance accounts could result in too much tax being paid. This problem would be more acute if the Annuity business were kept separately

from the Life Assurance business. An advantage of investing all sums arising from the variable annuity business in a Unit Trust would be that profits and losses resulting from re-arrangement of the portfolio from time to time would not become involved in the Company's taxation accounts. It would not overcome the problem of eventual sale of trust units.

The attitude of the Inland Revenue to separate assets for this particular class of annuity business is not known, but without their co-operation inherent dangers are such that it might be necessary to form a separate company to transact the business.

On the assumption that the business is a separate class of Pension Annuity business for taxation purposes, the 'exchange' element would result in a notional loss when market values of the assets exceed cost and a notional profit when cost values exceed market values. If expenses are excluded from the taxation computation and all profits arising from the business are reserved for the annuitants, then ultimately, in the case of a continued rise in the value of the 'currency', total profits from the realized assets would exceed the notional losses by the total of expenses. The expenses would have been relieved of tax through the management expense claim. If at any time the market value of the assets fell below cost, then the deficiency would give rise to a notional profit in the tax computation.

If the business was classified as General Annuity business, then similar considerations arise in a Type A case. In a Type C case the notional losses will be increased by the 'exchange' difference.

It would be more realistic if the Inland Revenue agreed to accept a valuation of the assets at the same rate of 'exchange' as that on which the liabilities have been valued, any profit or loss being brought into the tax computation.

#### *(b) Premium rates*

The assumptions concerning the rate of interest when assessing premium rates are very different in principle from those normally associated with Life Assurance and Annuity business. A compound rate of accumulation in a non-profit contract would be guaranteed in 'currency', whereas dividends would be received in 'sterling'. The yield from time to time would depend on the dividends

received divided by the rate of 'exchange' at that time. Dividends could remain unchanged, but the yield in terms of 'currency' would rise or fall with variations in the market values of the assets. In other words the yield on existing as well as new investments will vary with the general level of interest from time to time.

It is thought that this feature is sufficiently unsatisfactory to justify that the business should only be written on a participating basis.

#### CONCLUSION

Taxation of life annuity business is a subject needing the closest attention of the Actuary of a Life Office in view of the ever increasing volume of business from Retirement Benefit Schemes. It is certain that the Finance Act 1956 has added to his problems.

The present trend of high yields on new investments has resulted in a highly competitive market with reducing rates of premium. The strain of new business, coupled with a substantial fall in the market values of existing assets, could well mean some weakening of valuation bases for General Annuity business. It could also mean a higher rate of interest for Pension Annuity business than might at first have been contemplated.

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