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**A LOOK AT EQUITY, BONUSES AND PROFITS
USING AN OB PROFITABILITY MODEL**

by

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INDEX

1	INTRODUCTION
2	CONSTRUCTING THE MODEL
3	MY FIRST DISCOVERY
4	WHAT LEVEL OF EQUITY BACKING
5	EQUITY BACKING OF UNIT POLICIES
6	LAPSE AND SURRENDER RATES
7	QUESTIONS TO BE ANSWERED
8	THE INCIDENCE OF PROFITS
9	WHY CAN'T WE PROVIDE HIGHER BONUSES
10	SUSTAINING BONUSES FOR POLICIES OF DIFFERENT TERMS
11	MORE EQUITABLE SOLUTIONS IN CURRENT CONDITIONS
12	EXPENSES AND TAX
13	SOME REFLECTIONS ON THE POSITION TODAY
14	CONCLUSIONS

A look at Equity Bonuses and Profits using an OB Profitability Model

1. Introduction

1.1 I first prepared this paper for the Birmingham Actuarial Society and subsequently presented it at York. The policy used by way of illustration assumed investment performance up to and including December 1983. I felt it would be better to update these figures to the end of 1985 for the paper tonight. I have also included a few of the points raised in the earlier discussions by my critics and would thank them for all I learned on those occasions.

1.2 Those of us who are involved in technical actuarial work are fortunate these days to be able to use the resources of powerful computers in our investigations.

One of the tools that can be used is the profitability model.

This enables us to see the effect of changing various parameters either in isolation or in combination and see how various elements affect the profits arising from the business. We could consider these models as actuarial microscopes that can give a much closer insight into the actuarial world around us.

I have worked on various models in the last few years and felt it would be of interest to the society if we had a look at some of the interesting things I have discovered or rediscovered about the actuarial countryside when looking at OB business with the aid of the model.

1.3 I would like to thank those responsible in my office for permission to use our software in preparing this paper which has required little modification to produce the results presented. Rather than producing a rigorous study paper and voluminous tabulations for you all to wade through I felt it would be of more interest to come up with some conclusions of interest which you can ponder over and verify at your leisure.

The opinions expressed are my own and should not be taken to represent those of my office.

2. Constructing the Model

2.1 The assumptions made in the model do not represent the experience of my own office but are my own estimate of the experience of the industry.

For example the expenses are industry averages discounted by inflation over the past 25 years and rounded. The surrender basis is largely cribbed from the AES course on life office practice though it is modified to run up to the maturity value including terminal bonuses near maturity.

- 2.2 I hope you will not criticise my paper too much on the grounds of the standard assumptions made. I am sure no two actuaries would independently have set the same parameters in a similar investigation. What we can learn from is the effect of changing the parameters and then comparing the results against the standard.
- 2.3 As our standard I took a 25 year with profit endowment for a premium of £100 per annum age 30 at entry (see Appendix). This was chosen to enable comparison to be made easily with market surveys. The average premium assumed is probably too high to be typical of policies now maturing and thus the effect of varying the expense parameters (see section 12) is less marked than if a lower average premium had been chosen.
- 2.4 The most important parameters are the investment parameters. I used the De Zoete indices to derive these. My model will of course reflect the performance of this index and may not necessarily reflect the performance of the industry as a whole. I mention that I made an allowance for the expenses of dealing.

The investment policy assumed is quite critical and I have thus discussed this in sections 3 and 4 of this paper.

- 2.5 The bonuses were set by running through the model 3 years at a time and setting rates of bonus that could reasonably be supported in future, building in a margin of 1/2% for future reversionary bonus increases. Terminal bonuses were set to realistic levels and finally to a level which exhausted the fund at maturity.

Only on 2 occasions did there appear to be any difficulty in maintaining the previous bonus rates. The first was after the market fall in 1974 where I artificially reduced the finance required to cover the depreciation of assets.

The second occasion was close to maturity when a fall in inflation had reduced the expected investment performance. I ignored this and was able to increase final bonus in the last year. This serves to illustrate that the with profit system does give valuable guarantees to policyholders close to maturity, and the dangers that might arise in a falling equity market.

3. My First Discovery

3.1 When I first ran a profitability test I was appalled at the results. To justify current levels of bonuses on new business very high rates of return need to be earned. For example if in our standard investigation (see Appendix) we were to set the bonus rates to their final levels (of 6% compound plus 142% of attaching bonus in the event of a claim) we would have needed to obtain a fixed interest yield of 18.7% net or 26.1% gross (assuming tax at 30p) to justify them.

3.2 How can companies afford such high levels of bonuses? The answer is through equity investments.

This is not purely as a result of the equity performance of the last 5 years but also because of their favourable tax treatment. In practice a life office will pay very little capital gains tax so even if the gross yield on equities is the same as that on gilts then the net yield will be higher.

The gross yield on equities is likely to be higher than that on gilts in view of the extra risk involved thus the difference in net yields is even greater.

For example if gilts earned 11% gross say and equities 13% gross made up of 8.5% growth plus 4.5% running yield and tax is 30p; then the net yields are 7.7% on gilts and 11.65% on equities a difference of almost 4%.

3.3 It is thus critical to decide on an appropriate level of equity investment when making a profitability forecast. The more equities held the better the expected return.

4. What Level of equity backing

- 4.1 The concept of an equity backing ratio or EBR was introduced by an Institute working party in their paper on "bonus distributions with high equity backing" JIA 103.

At present a typical equity backing ratio for the industry as a whole might be 80%, but for an individual policy we might hypothesise that this started at 100% and then reduced as the policy approach maturity.

- 4.2 This is what we have done in the model assuming the fixed interest reserves approached the sum assured at maturity (the reversionary bonuses being protected from market fluctuations to some extent by the final bonuses). This gave an average EBR of 75%.
- 4.3 For a £100 per annum premium my hypothetical 25 year with profit policy would have produced a maturity value of £12091 plus 10% of bonuses to the shareholder. This would have been good enough to achieve 6th place out of 57 in the 1986 past performance tables. Does this mean that offices as a whole have managed to underperform the De Zoete index?

I expect the answer is more likely to be that a 75% EBR was not achieved. For example if the EBR was reduced by a factor of 15% throughout the maturity value falls to £10414 which would have put my policy just below the middle of the market at 35th place.

I give a table below:-

EBR	Maturity Value	Market Position
100%	13648	1st
75%	12091	5th
60%	10414	35th
0%	4545	57th

The equity backing ratio is thus one of the most critical factors effecting performance. It would seem that it is advantageous for an office to maintain the maximum EBR that is consistent with the requirements of solvency.

- 4.4 The incidence of equity investment is also critical. It is advantageous to the policyholder to invest heavily in equities at the outset and move into fixed interest investment as maturity approaches. This is what has been assumed in the standard model.

It might be argued that "Existing maturities would have profited more by assuming higher equity investment towards the end of the term as equity performance has been so good in the last 5 years, thus if they shared in a mixed fund with 75% equity investments throughout this would have given current maturities better results. This is not true and would have reduced the maturity value from £12091 to £9856 even in current conditions!

The effect of pooling assets may thus reduce performance considerably as the relatively large fixed interest reserves required for policies approaching maturity may drag down the performance of the fund as a whole.

5. Equity Backing on unit policies

- 5.1 When we first entered the unit market we had already come to the conclusion that a high EBR was in the interest of our with profit policyholders.

We then found that some unit policies had an equity backing ratio that exceeds 100% by financing the business by means of negative sterling reserves.

What return should be paid on these reserves that are either provided by shareholders or other policyholders?

- 5.2 In the case of a new company which raises marginal finance from shareholders they would require at least the same return that can be achieved elsewhere on the equity market.

In addition the company will be investing less of its funds in high yielding sterling assets and more in equities to back its increased unit liabilities. The result will be a reduction in its interest earnings and a larger excess E. Clearly the unit policyholder should pay for this.

- 5.3 Let us look at an established office.

The office will want the maximum EBR that is consistent with holding a prudent amount of fixed interest assets for matching purposes. The liabilities will be exceedingly long.

The main danger that faces such an office is that interest rates will fall in the long term.

Any fixed interest investments should thus be long term and in the event of these adverse conditions they will give rise to capital appreciation.

- 5.4 For an established office negative sterling reserves are a most inappropriate fixed interest investment. They are far too short term and may even give rise to some defaults in adverse financial conditions as a result of early lapse.

From the point of view of solvency this device is likely to undermine the security of the office in adverse conditions. I would be glad to see the facility of using negative sterling reserves removed from statutory valuations.

If the office finds it must finance new business strain on unit policies it should provide this finance from its free equity reserves and thus the yield required from the unit policyholders to finance these loans should be in excess of those obtainable from equity investments to pay for the risk involved.

6. Lapse and Surrender Rates

- 6.1 The discontinuance of policies through lapse or surrender historically has been a source of profit to the office.

The importance of this factor may easily be underestimated as not only will higher surrenders lead to more surrender profits but it will also lead to fewer surviving policyholders to share them. For example if we increased the surrender rate by a mere 2 per cent per annum throughout, (ie from 4% to 6% in year 1 etc) then maturity value supported by the model would increase from £12091 to £13129 which would have moved it into 2nd position.

- 6.2 Before you say thanks for high unemployment, have a look at your office surrender basis for policies of a few years' duration. Short term surrender values tend to increase far too rapidly when reversionary bonus rates increase and we may now be compounding up losses to be paid for by those few policies that survive. This is due to three factors at least:-

- 1) the relatively low rates of discount used in calculating surrender values;
- 2) the fact that bonuses are not fully earned at short durations and are subsidised by more mature policies;
- 3) the effect of equity investments on realised profits

We will look at points 2 and 3 again in section 8.

- 6.3 There is also a tax danger. With a high rate of lapse and surrender an individual tranche of business may be in an excess E position for many years. Thus a retrospective gross surrender value may be the most appropriate basis for the first half of a 25 year policy term!

- 6.4 Lapse and Surrender rates are much higher for Mortgage related business including low cost repayment plans. On this class of business we view the current situation with some concern as:-

- 1) The high surrender rate after about 5 years may put offices into a gross tax position;
- 2) Due to substantial reversionary bonus increases surrender values are already high even if the tax position is net;
- 3) Changes in practice on new business illustrations will encourage offices to compete on surrender values.

The immediate danger is not so much the solvency of the companies, but that continuing policyholders will have to subsidise a continuing surrender strain leading to poor performance and an uncompetitive life assurance industry.

7. Questions to be answered

- 7.1 From what we have said already there seems to be considerable justification for the "cult of the equity" in our current tax environment.

Now most offices have adopted this policy we could well ask again in this context a series of questions posed by Cox and Storr-Best in their book "Surplus in British Life Assurance"

- (a) Have actuaries been perpetually 'behind the event'?
- (b) Has an effective, lasting definition of equity ever been found?
- (c) Has equity in a broad sense been achieved in practice?
- (d) Have not methods of distribution often been justified more by reference to tradition and public taste than in relation to what is actuarially right?

We could continue but this seems sufficient to consider at present. Let us try to answer these 4 questions as we consider the next 4 sections on:-

- A) the incidence of profits;
- B) why can't we provide higher bonuses;
- C) sustaining bonuses;
- D) more equitable systems in current conditions.

8. The incidence of profits

- 8.1 The reversionary bonus system has reacted far too slowly to the changed pattern of investment which has risen as a result of "the cult of the equity"

We can see this clearly demonstrated if we look at the Analysis of Surplus (see final page of Appendix). It takes 19 years before the cost of bonus is covered by the loading and interest surplus. Even after 15 years the interest, loading and surrender profits only reached £63 far less than the cost of bonus declared of £102.

How can such bonuses be justified? If we look at the policy on its own the answer is by unrealised gains. The answer for the office as a whole might be from an estate built up from previous generations of policyholders.

- 8.2 Declaring reversionary bonuses in excess of the profits earned on the policy is unsatisfactory in at least 3 ways.

- A) A large estate must be paid for either by the shareholders or more likely by retaining profits from previous or current generations of policyholders.
- B) If unrealised gains are lost due to a fall in market values, the existing business (which has high reversionary bonuses as a result of subsidies from the estate) will then require further subsidies from the estate or new business as it will tend to support a lower rate of profits than new business.

In general after an improvement in investment conditions existing business tends to support a higher rate of bonus than new business and after a worsening of conditions the reverse applies and existing business supports a lower rate of bonus than new business. For example after an improvement it was stated "some actuaries view more than a moderate amount of new business with disfavour" see Cox and Storr-Best page 73. Given a computer model it is possible to construct scenarios where this is not true but there are exceptions to many rules.

- C) If reversionary bonuses are declared too early this will impose restraints on the investment policy. We argued in section 3 that a high EBR gives a better expected return to the policyholder. If an office increases its guarantees by declaring high reversionary bonus it should then maintain an appropriately higher level of fixed interest assets, thus reducing the EBR and expected rate of return. Perhaps this is a subject that deserves a study on its own.

- 8.3 The high rates of compound bonus which would be appropriate for an office earning high rates of return on fixed interest securities are unsuitable for an office with a high EBR particularly if market values fall. This may be seen if we consider existing business which has been in force 5 to 15 years. If the equity market continues to perform well we can afford to pay for the existing bonuses out of the profits these policies earn (heads they win). If the market performs less well existing bonuses will require to be subsidised (tails we lose). Only after a distinct market fall would I foresee a reduction in final bonuses and I suspect this might be inadequate to achieve equity.

There are some possible solutions to this situation but we will consider them in section 10.

- 8.4 When we revised our figures for the paper tonight, we were most surprised by restraints imposed by the model on the equity backing ratio which fell from 78% to 75%. At first I felt this was largely due to the increased reversionary bonuses (see section 8.2c). Infact the increased fixed interest reserves were generated as a result of lower fixed interest rates of discount. It is not difficult to envisage a situation arising where the present high levels of declared bonuses remain attaching to existing policies and lower levels of final bonus are covering offices against a fall in the equity market. If this happens the existing reversionary bonuses attaching to current policies will impose increasing restraints on investment policy over the next few years.

9. Why can't we provide higher bonuses?

- 9.1 One thing I have not discussed yet is shareholders profits. If these were set to zero in our example the maturity value could be raised from £12091 to £14925. This is far better than any policy actually paid.

In our example the profits to shareholders were 10% of bonuses valued at 2.5% and would have been worth £117 at outset. This seems a large amount when we consider this could have accumulated to £1586 at maturity (even more for each surviving policy). In practice many offices would have expected to subsidise their with profit business by profits arising from non profit contracts. So why have maturity values not been higher? The amount expected from mutual offices should presumably be the £14925.

- 9.2 Part of the reason is no doubt that equity backing ratios in retrospect were not as high as we would have wished. I will discuss tax and expenses later but these do not appear to be very significant factors compared to those already considered. We are still left with the question "Where has the money gone?" I believe it has been used to support a much higher level of existing reversionary bonus than is justified, thus we are robbing the sheep to protect the flock.

What this means is that much of the money is still with the offices! It is being used to support a much higher level of existing reversionary bonus than the policies have earned yet.

10. Sustaining Bonuses for policies of different terms

10.1 I have performed extensive investigations into this question and have come to the conclusion that in the market as a whole the most profitable policies for the industry are the longer term ones and the least profitable are the short term savings contracts. In real terms short term contracts provide little profit to the office and little security. The actual level of maturity values may be justified by equity investment performance.

10.2 It is particularly short term contracts which require the largest subsidies to finance current reversionary bonuses in excess of the profits earned (i.e. the bonuses justified by unrealised gains).

This can be illustrated by assuming a lower future investment performance say 13% gross for policies maturing in 5 years time. The pattern that then emerges is that short term 10 year policies cannot sustain existing levels of bonus, medium term ones can sustain existing levels whilst long term policies can sustain even higher levels of bonus than at present.

The problem is that we will have to pay out what we promise on short term policies very quickly and there is a danger that very real losses will be made on these either because the actuary is unaware of what is happening or finds it impossible to reduce bonuses for such short term policies because of competitive pressures (particularly if he wants to increase bonuses on longer term contracts).

11. More equitable solutions in current conditions

11.1 There are two solutions which would be more appropriate for offices with high EBR's today, neither of these are my own idea.

11.2 The theoretically best solution is to have a much lower rate of bonus on sum assured plus a high rate of bonus on bonus (to reflect the incidence of profits actually being earned) plus a final bonus to reflect capital gains when the policy becomes a claim.

This first solution is ideal for a new with profit series but does not cope with the existing situation where existing reversionary bonuses are already too high (e.g. a high rate of bonus on bonus would make the existing situation far worse not better, as we would be giving still more bonus to the policies which already have too much!)

11.3 A more practical solution might be to declare final bonuses by year of entry. If the scale started at zero for policies effected in the current year this scale would tend to increase with duration. Thus after a year with no capital growth (i.e. equities yield about 4.5% from dividends) the scale would remain unaltered and the actuary would be saved the embarrassment of reducing bonus rates yet would have effected a reduction in the claim values paid! Normally he would expect to be able to announce an increase in the bonus rates.

12. Expenses and Tax

12.1 Expenses

In the model we assumed that expenses other than commission and stamp duty increased with inflation and would thus roughly reach average levels for the industry today.

We had a look at what the results would have been if expenses excluding commission were 25% higher than assumed. This would have reduced the maturity value by £140 to £11951 assuming we were taxed at 37.5P. The change in maturity value is obviously far smaller than the changes considered in earlier sections.

At present expenses seem far less important than we might have expected.

12.2 Tax

We can consider two aspects of tax, relief on expenses which we will look at in section 12.3 and tax on income which we will consider in section 12.4.

12.3 Relief on expenses

If tax relief was not obtained expenses plus commission would be increased by $1 \div (1-t)$ i.e. by 60% if the office were taxed at 37.5P.

If we had obtained no relief on expenses in the model this would have reduced the maturity value by £918 assuming loss of relief at 37.5P.

This would correspond to a reduction of less than 10% in the equity backing ratio.

This demonstrates that though tax savings are real the financial implications of them may be far less than other financial matters that concern the profession. I wonder if actuaries as a whole spend too much of their time on relatively small tax savings.

Excess E may be considered a deferment of tax relief and thus as an interest free loan to the Inland Revenue.

I ran the model on a "stand on its own" basis deferring relief on excess E until it had been covered by interest. This reduced the maturity value by only £30! Thus it indicates excess E is not too critical a factor in the performance of savings contracts.

12.4 Tax on Interest

What is more critical is the rate of tax charged on interest and here our competitors such as building societies and banks may have an advantage with their composite rate of about 25.5P.

In fact offices are no longer paying tax at 37.5P, some will be paying at the corporation tax rate of 35P, others at 29P on franked investment income and gross offices may even be able to trade their excess E assuming a tax rate of 20P on the market.

An office in a gross position cannot be said to be in a more favourable position than a net office as it is making a tax loss on unclaimed expenses and is thus in a less favourable position than other offices. Giving away the loss to policyholders by costing savings contracts gross merely gives the tax loss away permanently.

The effect of assuming a lower tax rate of 25.5p would increase the maturity value by £1,716 to £13,807. Thus 1P off the tax rate increases the maturity value by £140 in our example.

12.5 Conclusions on tax and expenses

Why is it that expenses and obtaining tax relief on them seems to be of relatively low financial importance, yet the rate of tax appears more critical? I would suggest the situation has arisen due to the high levels of investment return currently available. If interest rates fall tax relief on expenses would then become more critical.

13. Some Reflections on the position today

It is relatively easy to look back on what has been done and point out how it could have been done better, it is more difficult to get it right in the first place.

Nevertheless it is sometimes useful to perform this exercise to see what we can learn for the future.

High EBR's in retrospect have been a good idea and seem something we should aim for in the future.

Why was this not done in the past? Apart from tradition and inertia there were some very sound reasons for not doing so. With most of the liabilities guaranteed by way of Sums Assured and Reversionary Bonuses, too high an EBR could have jeopardised solvency in the event of adverse equity performance. Today most offices have built up a substantial cushion of final bonuses which can be used to allow the office substantial investment in equities.

The danger in these times of lower interest rates is that final bonuses are reduced rather than reversionary bonuses leaving the office exposed to any future fall in the equity market.

Reversionary Bonuses should reflect profits that have been earned not unrealised gains.

One of the critics after the Birmingham meeting suggested we had made out a good case for lower reversionary and higher final bonuses. If this is true it was an unintentional conclusion which arose from any research. Nevertheless on reflection I thoroughly endorse the criticism and would echo the plea for reversionary bonuses to be reduced rather than final bonuses.

14. Conclusions

- 14.1 I hope I have provided food for thought and discussion. The picture in the actuarial countryside looks very different from the situation 20 years ago.
- 14.2 The best way to offer policyholders a good return is to invest a large proportion of their money in equity investments. This offices have done.
- 14.3 Unfortunately they have not moved with the times in respect of reversionary bonuses which are being allocated far too soon. This may have the following implications:-
- A) Surrender values may be too generous at early durations;
 - B) We may be less competitive than we need be (see section 9);
 - C) More serious problems of inequity and even losses are likely to occur if there is a deterioration in the investment market.
- 14.4 Finally we mentioned tax and expenses. The traditional problems of obtaining relief on expenses became less significant than investment performance in these times of high yields. But how can we compete with other providers of financial packages in the critical area of long term business if they obtain a lower tax rate than us?

APPENDIX

BASIS FOR PROJECTION OF ENDOWMENT WITH PROFIT POLICY

PROJECTION BASIS

INVESTMENT

Fixed Interest Yields:-

yr 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16+	21+	26
5.6	6.5	5.4	5.5	6.1	6.2	6.4	6.9	7.6	8.5	9.3	8.3	9.6	11.9	17	13.7	12.4	

Equity Income:-

4.5	4.8	5	4.1	5.2	5.2	5.8	4.4	3.2	3.8	4.4	3.2	3.2	4.8	11.7	5.98	5.26	
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Market Values:-

1	0.97	0.93	1.06	0.95	1.02	0.92	1.19	1.7	1.45	1.34	1.9	2.14	1.47	0.65	1.91	4.02	6.11
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Investment Policy:-

Gross Premium Reserve in Fixed Interest then following Percentage of Balance in Equities:-	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
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Equity Investments are Valued at Book Values which are written down to Market Values if lower & writtenup to the following percentage of Market Values if higher:-

10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
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MORTALITY

A67/70 Select

EXPENSES

Per Policy:-

15.5	1.55	1.55	1.55	1.55	1.55	1.55	1.55	1.55	1.55	1.55	1.55	1.55	1.55	1.55	1.55	1.55	1.55
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Claims Expenses:- on Death £6 ; on Surrender £2 ; & on Maturity £2 per policy.
plus Inflation at:-

3.76	2.35	1.84	4.78	4.61	3.66	2.46	5.85	4.76	7.86	8.98	7.64	10.6	19.2	24.9	13.6	6.47	
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Commission rates %:-

48.6	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
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Stamp Duty £ 0.5 per thousand

1.5% of fixed interest investment plus 2.5% of equity investment

LAPSES & SURRENDERS

Percent:-

4	4	4	4	3	3	2	2	2	2	2	2	2	2	2	2	2	1
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BONUSES (Rates per £100 Sum Assured)

Reversionary Bonus on Sum Assured:-

3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
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Reversionary Bonus compounded on Bonus:-

0	0	0	0	1	1	1	3	3	3	3	3	3	3	3	3	3	3
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Final Bonus on Bonus:-

0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
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Final Bonus on Sum Assured:-

0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
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TAX

Income Tax on Interest less Expenses at 37.5P

YEAR	INFORCE AT BEG	DEATHS	DECREMENT TABLE LAPSES/ SURRENDERS	MATURITY	INFORCE AT END	DEATHS	SURRENDER	MATURITY	POLICY AMOUNTS PAYABLE VALUATION RESERVES	GROSS PREMIUM RESERVES
0	0	0.0002	0.02	0	0.9798	2503.93	15.6	0	112.18	0
1	0.9798	0.0005	0.0392	0	0.9401	2540.4	65.6	0	228.16	0
2	0.9401	0.0006	0.0376	0	0.9019	2613.33	159.44	0	348.06	0
3	0.9019	0.0006	0.0361	0	0.8652	2686.26	250.2	0	471.98	0
4	0.8652	0.0007	0.0304	0	0.8342	2760.65	346.75	0	601.86	0
5	0.8342	0.0007	0.025	0	0.8085	2836.88	449.59	0	736.57	0
6	0.8085	0.0007	0.0203	0	0.7876	2913.87	558.66	0	876.25	0
7	0.7876	0.0008	0.0157	0	0.771	2996.85	676.65	0	1028.02	0
8	0.771	0.0008	0.0154	0	0.7548	3086.76	804.67	0	1186.71	50.69
9	0.7548	0.0009	0.0151	0	0.7388	3179.37	941.45	0	1352.65	94.91
10	0.7388	0.001	0.0148	0	0.723	3495.78	1091.72	0	1537.69	150.97
11	0.723	0.0011	0.0144	0	0.7075	3639.41	1256.96	0	1731.99	320.25
12	0.7075	0.0012	0.0141	0	0.6922	3788.07	1434.31	0	1936.1	353.48
13	0.6922	0.0013	0.0138	0	0.677	4884.26	1635.14	0	2177.95	346.66
14	0.677	0.0015	0.0135	0	0.662	5213.46	1862.69	0	2434.28	253.45
15	0.662	0.0016	0.0132	0	0.6471	3994.24	2109.25	0	2706.79	458.98
16	0.6471	0.0018	0.0129	0	0.6324	5829.81	2376.52	0	2995.2	591.87
17	0.6324	0.002	0.0126	0	0.6178	6196.09	2666.36	0	3301.36	945
18	0.6178	0.0022	0.0123	0	0.6033	6578.85	2980.82	0	3626.57	995.18
19	0.6033	0.0024	0.012	0	0.5888	7118.75	3455.61	0	3992.65	1111.87
20	0.5888	0.0027	0.0088	0	0.5774	7596.25	4171.27	0	4384.09	1343.76
21	0.5774	0.0029	0.0057	0	0.5687	8097.62	5022.6	0	4802.37	1496.47
22	0.5687	0.0032	0.0057	0	0.5598	9302.69	6518.86	0	5301.22	1873.04
23	0.5598	0.0036	0.0056	0	0.5506	10035.89	7924.93	0	5840.1	2114.69
24	0.5506	0.0039	0.0055	0	0.5412	10813.09	9616.53	0	6422.81	2354.27
25	0.5412	0.0021	0.0027	0.5365	0	12091.2	11389.48	12091.2	0	1

TIME	PREMIUM	SURRENDER	DEATHS	NATURAL REVENUE	ACCOUNT INTEREST	EXPENSES	TAX	GAINS	FUNDCF
0	100	0	1	0	2	65	-24	-1	58
1	96	3	1	0	6	4	1	-4	147
2	92	6	2	0	9	4	2	-9	226
3	88	9	2	0	13	4	3	31	340
4	85	11	2	0	18	4	5	-38	384
5	82	11	2	0	23	4	7	-24	489
6	80	11	2	0	28	4	9	-48	523
7	78	11	2	0	32	4		149	754
8	76	12	3	0	37	4	11	322	1159
9	75	14	3	0	41	4	12	-169	1071
10	73	16	4	0	49	4	17	-77	1076
11	72	18	4	0	55	4	19	404	1561
12	70	20	4	0	69	4	25	169	1816
13	68	23	5	0	75	4	27	-495	1405
14	67	25	7	0	83	4	29	-656	832
15	65	28	8	0	98	5	35	923	1844
16	64	31	11	0	124	5	35	-61	1880
17	63	34	12	0	152	5	45	618	2606
18	61	37	15	0	183	6	55	51	2777
19	60	42	17	0	220	6	66	92	3004
20	58	37	20	0	254	7	80	633	3793
21	57	29	24	0	280	7	93	215	4183
22	56	37	30	0	315	7	102	732	5097
23	56	44	36	0	350	8	115	931	6218
24	55	53	43	0	413	8	129	1311	7742
25	0	31	25	6486	110	8	152	323	1586
26	0	0	0	0	75	0	28	78	1711
PROFIT OF BUSINESS TO FUND AT 10.98% BEFORE SHAREHOLDERS BONUS							117.24		

[illegible]

TIME	LOADING SURPLUS	INTEREST SURPLUS	CAPITAL GAINS	ANALYSIS OF SURPLUS	COST OF MORTALITY SURPLUS	SURRENDER SURPLUS	SOLVENCY MARGIN	MISC SURPLUS	FINANCE REQUIRED	NATURAL SURRENDER PROFIT
0	-13	-1	-1	45	1	0	0	3	57	0
1	24	0	-7	44	0	3	0	1	21	2
2	23	1	-12	43	0	4	0	1	26	2
3	22	1	0	42	0	5	0	1	13	2
4	21	3	-5	43	0	5	0	1	19	3
5	21	5	0	44	0	5	0	1	12	1
6	20	6	-28	44	0	5	0	1	42	2
7	20	7	0	50	0	4	0	1	19	0
8	19	8	0	52	0	4	0	1	20	0
9	19	9	0	54	0	5	0	1	21	3
10	18	12	0	65	0	5	0	1	29	10
11	18	15	2	67	0	5	0	1	27	6
12	17	23	0	70	0	5	0	1	24	4
13	17	24	0	93	-2	5	0	1	48	11
14	16	28	0	97	-2	5	0	1	49	14
15	16	41	0	102	0	6	0	0	40	4
16	15	58	0	107	-3	6	0	0	31	-11
17	15	79	65	112	-4	6	0	0	-48	7
18	14	97	0	117	-5	5	0	0	5	4
19	13	127	0	136	-6	4	0	0	-2	15
20	13	150	0	143	-7	0	0	0	-12	13
21	12	165	0	152	-9	-3	0	0	-14	7
22	12	188	0	193	-13	-9	0	0	14	8
23	11	211	0	206	-16	-14	0	0	14	4
24	11	259	0	221	-19	-20	0	0	-11	5
25	-5	159	7790	339	-12	-14	0	-3040	-4539	6

NOTE MISCELLANEOUS SURPLUS ARRISES FROM: - NEW BUSINESS; MATURITIES; THE TEMPORARY RESERVE & ROUNDING