

**Actuarial Society of India**

**Examinations**

**November 2005**

**CA3 – Communications**

Indicative Solutions

Q.1)

Dear Mr Johnson,

### **Unit-linked and with-profits products**

Thanks for the queries on the captioned matter.

First of all I would like to explain the basic differences between unit-linked and with-profits products including the differing payouts on death and maturity under the products. I will then explain why the with-profits product can be attractive in certain circumstances.

#### **Nature of the products**

Under the unit-linked product the policyholder basically receives the value of the underlying investments less any charges levied by the company. In this case under the 6% scenario our existing product gives a return of 4.25% (6% less the 1.75% charge) and correspondingly receives 8.25% under the 10% scenario. On death under our proposed product only the value of the fund is received.

Under the with-profits product the policyholder first purchases a sum assured which is then increased by bonuses depending on the performance of the company with the amount of bonus declared being at the discretion of the company. On maturity the policyholder receives the sum assured plus all the bonuses. In computing the illustrated values a bonus rate is computed which is supportable under the relevant investment scenario.

In our example of a 6% investment return the corresponding bonus rate is 4% of the sum assured so that each year 4,000 is added to the sum assured to give a total bonus of 20,000 and therefore a total projected maturity payout of 120,000 (the sum assured under this product equals the single premium i.e. 100,000). The bonus rate is not guaranteed and also depends upon other factors such as expenses. On death the sum assured plus the bonuses declared to date are paid.

#### **Merits of the with-profits product**

The with-profits product unlike the unit-linked product offers a guarantee. Under no circumstances can the maturity value fall below the sum assured. Under the unit-linked product if the underlying assets perform very poorly then the payment could be below the single premium paid which is not possible under the with-profits product.

The unit-linked payout is determined given a particular earned rate of return but this is not the case with the with-profits product. Even under a 6% return the bonus rate could

be higher than that illustrated if for example expenses prove to be less than that assumed. Therefore, there is a potential further upside under with-profits which is not available under unit-linked.

On death the unit-linked product only pays out the fund value and therefore if death occurs at a time when the financial markets are down very little could end up being paid on death. On the with-profits product the death payout can never be less than the sum assured even if no bonuses are declared.

### **Summary**

In summary, the with-profit product offers guarantees whereas the unit-linked product does not. Therefore, under unfavourable investment scenarios the with-profits product may pay out more than the unit-linked product.

Furthermore, all benefits are defined at outset under a unit-linked product and for a given investment performance the maturity value is fixed. However, for a with-profits product some of the benefits are discretionary and therefore higher bonuses can be paid than those illustrated for a given investment return, this can particularly happen if for example expenses turn out to be lower than those assumed when deriving the illustrated value.

I trust this satisfactorily answers your queries.

Yours sincerely,

John

**Marking guide**

Marks are split as follows –

Meeting objectives	Upto 12 marks
Presentation	Upto 24 marks
Contents	Upto 24 marks

**Meeting objectives**

Has the script met the overall objective of:

- Explaining the differing nature of the products? [3]
- Explaining the differing payouts on death and maturity [1]
- Explaining the merits of the with-profits product [2]

Will the reader:

- Understand the explanations? [3]
- Be satisfied with the answer? [3]

**Presentation**

- Clear statement of purpose [3]
- Logical structure [3]
- Appropriate language used [4]
- Suitable sentence length [2]
- Suitable introduction with confirmation of the subject [2]
- Ideas grouped appropriately in paragraphs [2]
- Suitable summary [2]
- Suitable ending [1]
- Correct grammar [2]
- Correct spelling and punctuation [3]

**Contents**

- Unit-linked return being investment return less charges [2]
- With-profit return being sum assured plus bonuses [3]
- Bonuses at the discretion of the company [2]
- Supportable bonuses used in illustration [2]
- Explanation of the maturity returns under both products [6]

- Explanation of the return on death under both products [1]
- Guarantee offered under with-profits [2]
- Guarantee can be valuable under adverse investment scenarios [2]
- Unit-linked return fixed given a certain investment return [2]
- Bonuses can be higher than those illustrated for the same return [2]

### **Penalties**

Cut marks for

- Very poor grammar, spelling or punctuation
- Requests for more information
- Speculative statements
- Excessive waffle

## Q.2)

Dear Mike,

**Net present value**

I explain below how the net present value approach works in relation to measuring the profitability of life insurance products.

*Compute profits*

The first step in the net present value approach is to compute the profits and losses to the shareholder from the product. The way this is done is by making certain assumptions about the future. The assumptions are chosen on a best estimate basis that is neither optimistic nor pessimistic. Key assumptions that affect the profitability include investment return, mortality and expenses.

*Present value*

The profits and losses occur at different times in the product's life. A profit of say 110 in one year's time is worth less to us than an immediate profit of 110. For profits occurring in the future we therefore compute what is known as the present value of the profit.

So in our example above we need to work out the present value of 110 in a year's time. The value today of 110 in a year's time depends on the return you assume you can earn on your money. For example, if you can earn 10% then the present value is 100 as earning 10% on 100 gives you 110 in a year's time. If however, you can earn 15% then the present value is 110 divided by 1.15 to give 95.65 – so if you invest 95.65 for a year and make a return of 15% then you will have 110 at the end of the year.

*Net present value of profits*

We calculate the present value of each profit amount (allowing for when it occurs) and then sum up to give us the total present value of profits. This total present value of profits is known as the net present value of profits. The 10% in our example is known as the discount rate and in the net present value approach the discount rate is typically higher than the assumed investment return to reflect the risks involved with a life insurance product. For example, risks would be that you actually make a lower investment return than what you have assumed or that expenses are actually higher than assumed. The higher the discount rate the lower the present value of the profit as we have seen above.

The net present value has to be above a certain number for the product to give a satisfactory return to the shareholders. The normal way of specifying the minimum number is to require the net present value to be at least a certain percentage of premium and/or a certain percentage of commission.

I trust the above satisfactorily explains the concept of net present value in relation to the profitability of life insurance products.

Regards/Ram

**Marking guide**

Marks are split as follows –

Meeting objectives	Upto 8 marks
Presentation	Upto 16 marks
Contents	Upto 16 marks

**Meeting objectives**

Has the script met the overall objective of:

- Explaining the net present value approach? [2]
- Explaining the concept of present value? [2]
- Explaining benchmark issued [1]

Will the reader:

- Understand the explanations? [2]
- Be satisfied with the answer? [1]

**Presentation**

- Clear statement of purpose [1]
- Logical structure [2]
- Appropriate language used [4]
- Suitable sentence length [1]
- Suitable introduction with confirmation of the subject [2]
- Ideas grouped appropriately in paragraphs [2]
- Suitable ending [1]
- Correct grammar [1]
- Correct spelling and punctuation [2]

**Contents**

- The computation of shareholder profits [2]
- Best estimate assumptions [1]
- Key assumptions [1]
- Concept of present value [4]
- Concept of NPV of profits [2]
- Concept of discount rate [2]



- Risk and the discount rate [2]
- NPV benchmarks [2]

**Penalties**

Cut marks for

- Very poor grammar, spelling or punctuation
- Requests for more information
- Speculative statements
- Excessive waffle

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