

**Subject ST2 — Life Insurance
Specialist Technical**

EXAMINERS' REPORT

April 2008

Introduction

The attached subject report has been written by the Principal Examiner with the aim of helping candidates. The questions and comments are based around Core Reading as the interpretation of the syllabus to which the examiners are working. They have however given credit for any alternative approach or interpretation which they consider to be reasonable.

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Chairman of the Board of Examiners

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Comments

Comments for individual questions are given in the solutions that follow.

- 1** *Comments: This was a standard bookwork question and those candidates that clearly had good knowledge of unitised accumulating with profits contracts tended to score well.*

The contract, as a with profit contract, participates in the profits/losses of a defined book of business.

A regular bonus is usually added annually which will be calculated in relation to premiums paid to date plus previously declared bonus.

A terminal bonus might also be added when a policy becomes a claim (e.g. on death, maturity or surrender).

It looks and operates very much like a unit-linked contract, but the key difference is how the unit prices and hence benefits are determined.

There are two ways in which the unitised part could operate:

1. *Annual bonus via bonus units:*
The price of the unit remains constant.
Additional units are allocated to each contract.
They are usually added annually at the bonus declaration.
2. *Annual bonus within unit price:*
The unit price is changed to reflect the annual bonus.
This is normally done on a daily basis.

There is a minimum guaranteed increase/addition, but this minimum could be zero. Other than any guarantee, the bonus is completely at the company's discretion, bearing in mind policyholders reasonable expectations.

On surrender, the company may retain the right to apply an MVR. The size of the MVR is at the discretion of the company and bearing in mind policyholder expectations.

Death benefits could vary according to the type of policy, for example a guaranteed sum assured, return of premiums, return of fund. It is not usual for an MVR to be applied to death benefits.

There is flexibility in terms of premium payments, which may be single lump sum, recurring single premiums or regular monthly or annual premiums.

Charging structures could be any combination of charges such as policy fees, allocation rates, bid/offer spreads, risk benefit charges, annual management charges, surrender penalties.

Or alternatively the charges could be taken implicitly through the bonus rate, with no explicit charging structure.

- 2** *Comments: This question was generally fairly well answered. The better candidates tended to be more descriptive e.g. explaining that the company may consider alternative product designs or alternative uses of capital, rather than just describing that the company would bear in mind the capital required to write the product.*

The factors that the company would take into account in deciding whether to launch this product include:

Demand in the market

Consider whether there is sufficient demand for this product in the market.

The extent to which there is a need for this product must be assessed. If the product fulfils a clear consumer need then it is likely to be easier to market and sell the product

e.g. the primary purpose of the product may be to provide for funeral expenses or it may be to meet a tax liability that may arise on death (due to inheritance tax).

The extent to which competitors already sell similar products in terms of premium rates and product design should be taken into account, as should the level of sales achieved by competitors.

In assessing the likely demand for the product the insurer will also take into account the alternative investment vehicles that may be available to the consumer to meet the same needs.

It may be that there is a demand for this product from the distribution channels of the insurance company e.g. if the company sells through independent financial advisers then they may have requested the insurer to consider launching such a product so that the insurer is offering a full product suite to meet customers' needs.

The company should consider the impact on sales of other product lines within the company – it may be that sales of other products will be reduced

An alternative may be that the insurer is at risk of losing other types of business if it does not consider adding this product to its suite of products, since, for example, a firm of independent advisors may choose not to recommend any products from an insurer that does not offer a wide variety of product lines.

Profitability

The company needs to make sure the product is profitable.

Profitability is a function of volumes and the expected unit profit per policy.

The company will need to write sufficient volumes of business such that the overheads of developing and launching the product, including making system changes and designing sales and marketing literature etc, can be covered.

However, the company would not want to write such high volumes of business that created administration problems in terms of servicing, which in turn may lead to customer complaints/bad press.

The company would carry out cashflow projections of the business, taking into account the expected likely future levels of investment returns, expenses (allowing for expense inflation), mortality, lapses and withdrawals and so on, to determine the likely future profit stream that will arise in the future.

The insurer would assess the sensitivity of the shareholders profits arising to variations in the assumptions, (e.g. if investment returns turned out to be generally lower than anticipated, or expenses higher than expected, mix of business by policy size).

The insurer would need to consider the level of surrender benefits, if any, to be paid and build this into the profit testing.

The insurer would consider whether reinsurance is available, and whether it is necessary to manage risks. This would need to take into account the cost of any reinsurance. There may be the possibility of obtaining technical assistance from reinsurers.

The insurer would need to assess alternative uses of the shareholders capital and whether there is a more profitable product that could be launched or an alternative way of utilising the capital (e.g. launching a new distribution channel, unit linked product, or addition of options on existing products) that is likely to offer a greater return.

Capital required

Overall launching any new without profits contract is likely to be fairly capital intensive, due to the initial new business strain and the capital support required at outset.

The insurer would consider the popularity of traditional without profits contracts in comparison to launching a other savings contracts with lower capital requirements. (e.g. unit linked savings contracts).

The insurer would take into account the level of its free assets and its ability to write business that is capital intensive.

Regulatory and economic environment

The insurer will consider the local regulatory environment.

It is likely that the local regulations would allow such a product to be launched but there may be requirements in respect of the minimum surrender value that must be paid at particular duration or there may be particular tax regulations that should be taken into account when designing the contract.

In addition, the local insurance regulator may stipulate other items e.g. a cap on the total charges that can be taken from such a product, the impact of charges on the death/surrender payouts if death/surrender occurred after particular durations, the stipulation of premium rates, or level of disclosure required etc.

These will all impact the charging structure that the insurer can use and the level of attractiveness of the product to the end consumer.

The insurer will also consider more general factors, such as the economic scenario, and whether generally now is a good time to launch such a product

Other

The insurer would also want to consider

- whether the level of risks introduced are acceptable (e.g. mortality risk)
- whether the administration system can cope with this product design
- any additional costs involved in training/system developments,
- potential lapse and re-entry issues in the future, and may want to mitigate this risk by, for instance, building in premium or benefit reviews, or reducing the premium payment term (policyholders are less likely to lapse close to the end of the term)

3 *Comments: Part (i) of this question required candidates to relate the valuation principles to the product described. In many cases candidates quoted the principles – including those that were not relevant to this product e.g. mentioning bonuses – but made limited attempt to relate them to the product described. Part (ii) was poorly answered with many candidates not using the details given in the question, and using the terms solvency requirement and supervisory reserves loosely.*

- (i) The amount of reserves should be such as to ensure that all liabilities arising out of the contracts can be met by the life insurance company.

The reserve would therefore need to cover all unit and non-unit liabilities e.g.

Unit liability on maturity
Surrender benefit
Death benefit
Future expenses
Any future commission

The reserve in total should be sufficient to cover the expected death benefit, using the unit and non-unit reserve.

The reserve should also allow for future income from annual management charges and take credit for charges from future premiums

Will need to ensure that the higher annual management charge on capital units is sufficient in order to purchase units in line with funding plan and meet ongoing expenses. This will limit the extent to which actuarial funding can be applied.

The reserve held covers the surrender value of the policy. The unit reserve held is sufficient for this purpose.

The amount of the reserves should be calculated by a suitably prudent actuarial valuation of all future liabilities for all existing policies.

When determining the extent to which actuarial funding can be applied, need to make a prudent allowance for future renewal expenses, including renewal expense inflation

The assumptions for future mortality would need to be prudent and based on the company's recent experience.

A prudent (i.e. low) unit growth rate would also be assumed when projecting future annual management charges for comparison against future expenses.

The method should take into account the nature, term and method of valuing corresponding assets and, by basing on bid value of units, the reserve complies with this.

The method of calculation of the reserves should be such as to recognise profit appropriately and not be subject to discontinuities. This is complied with.

Approximations can be used if necessary (e.g. using model points etc) and the method and basis should be disclosed.

- (ii) The overall protection for policyholders is maintained by a combination of the reserves and the solvency requirement. If the reserving basis is prudent then the solvency requirement need not be as high.

The Finance Director is correct to say that if the solvency requirement is lower then the protection to policyholders is reduced.

The reserves in this case have been calculated in line with the appropriate principles and with prudent assumptions. The solvency capital is additional to the reserve, and given the reserve is designed to meet all liabilities, it is adding to the protection for policyholders.

However holding a capital requirement that is a percentage of reserves can be seen as a very simplistic approach to providing this protection

The overall solvency capital requirement will be positive in this case, being a positive percentage of the all reserves plus a percentage of the sum at risk, which will also be positive.

The Finance Director is correct that holding less than bid value of units will result in a lower solvency capital requirement in terms of a proportion of reserves.

The sum at risk will be higher as actuarial funding has been adopted and hence the overall solvency requirement will depend on relative proportions of sum at risk and reserves.

- 4** *Comments: This was a relatively straightforward question, but surprisingly many candidates failed to score well. Many candidates failed to discuss the importance of checking the results from the analysis and checking that the data used in that analysis was correct. Candidates also lost marks by not describing the results of the investigation, such as the high rates of surrender at durations 0 and 5.*

Validation

The company needs to check that there are no errors in the calculations and data, particularly since this is the first time that it has been done for this product.

It needs to check that the data is complete.

In doing these validations, it should look at both the data on surrender rates and the data on total exposure.

It should check that all of the data is in respect of this product only.

It could use a recent analysis of surplus to check if the surrender profits/losses are consistent with the surrender experience shown

Credibility

The company should consider the amount of exposure for each of the in-force durations.

It should then decide whether the experience investigation results are credible.

For example there might have been very few bonds sold more than 8 years ago, which would make the 8+ result unreliable.

Relevance

The surrender rate assumptions used in profit tests should reflect the future expected experience in respect of these contracts.

The company therefore has to decide whether this historic investigation is a fair reflection of future expected experience.

It therefore needs to consider whether any changes have been or will be made which might reduce the relevance of historic experience, such as:

- Product design and/or charging structure.
- Distribution channel.
- Target market.
- Investment Performance

The company should consider whether any external influences might have affected surrender rate experience during the past calendar year, such as:

- Economic environment.

- Level of competition in investment bond marketplace.

It also needs to consider the extent to which these external influences are expected to continue.

Trends

The company has only one year's worth of experience analysed and so it is not possible to identify trends in surrender rates that might be expected to continue in future.

The company should therefore perform further investigations of previous years' experience, and repeat the analysis in the future. This depends on historic data being available.

This additional analysis will also help to give credibility to any proposal.

Assumption changes

Based on the limited analysis performed, the surrender experience would suggest that the magnitude of the profit test assumptions should be changed, since the average is very different from the 3% per annum currently assumed.

There also appears to be some variation in experience by duration in-force, and so the profit test approach might be changed in order to reflect this, rather than continuing to use a level assumption throughout the whole projection period.

Comments on specific durations

Curtate duration 0:

- There is a significantly higher rate in the first year
- Hence the first year rate should be increased e.g. to 7%.
- However, it needs to be checked that the experience data does not include policies which "cool off" at very early durations and simply receive their premium back under statutory law and so which do not constitute a normal surrender.

Curtate duration 5:

- The experience suggests a significant increase in surrenders at curtate duration 5.
- This might be a feature of the product design, for example surrender penalties being removed after the fifth policy anniversary.
- If this is the case and it is supported by previous years' experience (if available), then the profit test should reflect this higher surrender rate.
- However if there is no apparent reason for the spike and it occurred only in the last calendar year, then the company might choose to average it across other durations.

Curtate duration 8+:

- For policies of over 8 years in-force, the surrender experience appears to be lower than that assumed.
- Given that bonds have been in-force up to fifteen years, then if there is sufficient volume of data available it would be useful to split this figure into individual years in order to see whether there is any marked trend by increasing duration.
- Particularly since around 65% of policies might be expected to continue in-force beyond this duration.

Other durations:

- The surrender rate appears generally higher than assumed and it would therefore be appropriate to increase the assumptions, for example to 4.5% per annum for the second to fifth projection years.

Other considerations

The profit test assumption of 3% per annum might include a prudential margin, in which case the proposed changes would be even greater.

If that is the case then the cost of changing the system will have to be weighed up against the benefit of the possible increased accuracy.

The company should consider whether other assumptions should also be reviewed in light of this investigation, such as those used in the valuation of in-force business or in reserving calculations.

The company should look at the sensitivity of profit to changes in the surrender assumption.

The company might wish to look at industry-wide experience for this type of contract, if available.

The company might wish to carry out further investigations, splitting the data by other factors (e.g. distribution channel or size of policy).

- 5** *Comments: Part (i) was generally well answered with most candidates covering the bookwork details well. Better candidates discussed the issues surrounding the lack of availability of assets of a suitable term.*
Part (ii) was also well answered. The better candidates recognised the importance of splitting the returns from property and equity into rental/dividend income and gains, rather than just describing the volatile returns from these assets.
Part (iii) was poorly answered with many candidates failing to describe adequately the additional considerations to be taken into account in the investment strategy. A number of candidates didn't express investment strategy in anything but broad terms (e.g. "invest in riskier assets") so did not score as well as they otherwise might have.

(i) ***Matching assets and liabilities***

The company will wish to invest in assets that match the nature, term and currency of the liabilities.

The benefit payments can be sub-divided into the following:

Guaranteed in money terms – this consists of all future annuity payments that are fixed.

Guaranteed in terms of an index – this consists of all future annuity payments that are linked to an index.

This could also include expenses which are not strictly guaranteed, but which are usually treated as being linked to a price index for investment matching purposes.

Matching investments could be as follows:

Guaranteed in money terms – This is likely to be fixed interest securities.

To achieve as close a match as possible, then risk-free securities (e.g. Government Bonds) should be used in the same currency as the liabilities.

This will involve taking into account the term of the liabilities and hence the probability of payments being made. It may be hard to find assets that exactly match the liability outgo, particularly since the liabilities are likely to be of long duration and terms for fixed interest are often shorter.

Immunisation could be used but this is subject to theoretical and practical problems.

Guaranteed in terms of an index – a suitable match for index-linked annuities would be index-linked securities.

As discussed above, this would be also be relevant for expenses.

Again the term of the liabilities should be considered and similar issues arise as for the guaranteed in money terms liabilities. In their absence, a substitute would be assets that are expected to provide a "real" return. However this could introduce some risk if the assets are not risk free.

It will be necessary to consider diversification of assets, avoiding concentration where possible.

It will be necessary to consider any regulatory restrictions (e.g. admissibility limits) or any tax implications (e.g. balance between income and capital gains)

(ii) ***Investing in property and equities***

In general investing in property and equities would be expected to outperform fixed interest in the long term, but there would be a need to consider any regulatory restrictions that prohibit or limit investment in properties or equities.

Property returns are made up of a mixture of rental yields and growth in market value.

The return on rental yields may be a relatively good match to index linked benefits, and expenses, but it is unlikely to match exactly.

Growth in property is volatile and will also cause a mismatch between income and outgo.

Property is a long term investment and in this respect it is a match for the term of the liabilities.

The general characteristics of the commercial property market could cause matching or investment performance issues

- Illiquidity causing delays in sales of assets
- Large investments which will require a large block of annuities
- High transaction costs, reducing investment performance

For equity, both income and growth can be volatile and so will cause a mismatch.

Equities are also long term in nature and so can be a match for the term of the contract.

The company may not have suitable expertise to invest in property or equities

The extent to which the company can depart from its matching strategy will depend on its free assets.

The risk of insolvency would need to be considered, for example the value of the equities could drop by large amounts in one day but the liabilities would not change because of this.

The impact on the reserves and capital requirements would also need to be taken into account. Mismatching is likely to increase capital requirements.

Overall, subject to holding adequate capital, it may be possible to invest some of the assets in either property or equities – improving diversification; property is more likely due to the relative stable nature of the rental income, versus the volatile nature of dividends.

An alternative way of increasing returns would be to invest in higher yielding fixed interest bonds.

These would have higher default rates; however, some of the additional yield could be due to the illiquidity of the bonds. Since annuities are illiquid in nature, as they can't be surrendered, can take credit for illiquidity premium.

(iii) ***Matching with profit annuities***

As well as there being fixed benefits and expenses as for the without profit annuities, there are also discretionary benefits to consider.

These discretionary benefits will be in the form of bonuses payable.

The guaranteed benefits are therefore increasing at an unknown rate. The aim will be to maximise the returns on these discretionary benefits.

Policyholders will expect a real return on their investments. Hence the assets should be those that expect to earn a real return, for example equities or property.

Assets that are expected to give higher returns usually show more variance around that return.

The extent to which the company will invest in more volatile assets will depend on the free assets.

It will also depend in the level of guarantees under the policies.

For example it could be argued that even though the bonuses are discretionary, policyholders have expectations around the level of future bonuses. This is especially the case for annuities, where the annuity may be a significant proportion of the policyholder's income.

Therefore the company may wish to ensure that the probability of the bonuses falling below a certain level is within acceptable limits and smooth bonus rates appropriately.

- 6** *Comments: This question was not particularly well answered.*
In part (i) whilst random fluctuation risks were covered well, many candidates demonstrated a poor understanding of model and parameter risks.
In part (ii) better candidates demonstrated a clear understanding of the different mortality risks faced under the whole of life contract, and provided a more detailed discussion on the decision on whether to underwrite or not.
Part (iii) was generally well answered, with better candidates considering a wider range of issues surrounding outsourcing.

(i) *Model and parameter*

There is the risk that the fixed percentages may become out of date and not adequately reflect the mortality of the business written.

There is a risk that the table may become out of date and unrepresentative of the business that the company writes.

There is a risk that the mix of business changes in the future, by

Sex

Age

Smoker/Non Smoker

Class of Life

The fixed percentage will have meant some cross subsidies are likely to have existed in the past.

The view of future mortality improvement or deterioration may have changed and hence the level within the table may not be appropriate, or equally may affect different classes of lives in different ways – invalidating the assumption.

There may be an anti-selection risk if the market changes and other companies target certain lives (e.g. non smokers, specific classes or age ranges)

Any changes in underwriting process will invalidate the assumption.

Changes to the target market or distribution channel would invalidate assumptions.

There may be a potential impact arising from a tranche of selective withdrawals.

Random Fluctuations

The company is small and so it is possible that it has a small number of claims in any given year.

This means that it may be susceptible to random fluctuations.

Abnormally heavy claim experience may threaten the company's solvency.

This could happen through particularly large claims, or as a result of an unusually high number of claims.

New diseases or disasters could result in high claims.

(ii) The company has little experience in the mortality of the proposed age group.

Mortality improvements (or deterioration) over time may be different for different age groups.

The fixed percentage approach used for the existing contract may be overly simplistic for this age group.

It is possible that the customers for the new contract come from a different socio-economic group to the existing contract type. The possibility of no underwriting would also make the new population significantly different to the existing population.

The current model may therefore be inappropriate and the current parameters are likely to be inappropriate.

By moving into a new market and, therefore, possibly leading to a significant increase in the number of customers, the random fluctuation risk could be reduced.

In order to derive a suitable basis for this product the company should

- Consider the information available from the published mortality investigations (from actuarial profession or other sources).
- Seek the advice of its reinsurers, as it is very likely that it will reinsure some of the new business.

The decision whether to underwrite or not is very important.

No underwriting would

- Possibly be more in line with the market for this product
- Be cheaper, due to no underwriting costs
- Not increase the number of claims (as whole of life)
- But would accelerate them
- Specifically, there may be some claims close to the point of sale.
- The different claim profile is not a problem as long as it is reflected in the pricing basis.

Having underwriting would

- mean that your product was cheaper due to select mortality
- But customers may be prepared to pay higher premiums in order to avoid underwriting.
- The cost of underwriting may be prohibitive if average sum assured is low.

If not all policyholders are underwritten then the company could be exposed to anti-selection risk.

To make the decision would need market research.

- Sales volumes may be higher if there is no underwriting
- A market niche with sufficiently high sums assured could justify underwriting?

- (iii) Competitiveness in the market may mean that expense control is an important issue for the company.

The company will want to increase profitability, and outsourcing may enable this. As the company is small it may be that it cannot achieve the same economies of scale as its competitors.

Outsourcing may increase the new business capacity of the company.

It is possible that developments required, for example, regulatory changes are costing a disproportionate amount of the company's expense budget.

The company may be finding it difficult to recruit and retain staff.

It may be concerned that it has not and will not be able to maintain cost control and so costs may rise faster than its competitors.

Advantages

The outsourcing company may have better customer service standards than those currently within the life company, leading to potential better retention of policies.

Entering into the arrangement will give greater certainty to the costs that the company will incur over the guaranteed period. This will enable greater confidence in pricing and reserving.

The fee may result in lower fixed expenses.

The outsourcer may have better IT systems than the company and thus improve servicing overheads. By putting the business on the same IT platform as the outsourcer's other clients, the company is achieving a greater economy of scale. The costs of future industry wide changes can be shared with the other companies. The development costs of new products may be reduced as the outsourcer may have experience of the new product types.

If underwriting process is outsourced then the life company may benefit from better underwriting service standards and reduced underwriting costs.

This may free management resource for other areas of the business.

Disadvantages

The company is no longer directly in control of customer contact. As a result, the company will wish to agree the service standards that the outsourcer should apply to ensure that the company does not suffer from customer dissatisfaction and consequential brand damage.

If underwriting processes are outsourced then the life company will suffer from a loss of control over those processes and may experience a fall in underwriting standards.

The company is liable for the migration and development costs and risks inaccuracies and work not being completed on time. These costs will be crucial in the business case justifying the decision.

The life company will have limited control over these costs, as a significant proportion will be incurred by the outsourcer.

There will be an increased policy size risk due to having a fixed fee per policy.

There may be limited control over the fees that will be charged at each renegotiation. If the rise is significant the company may have to move the business back in-house or to another outsourcer. The likelihood of this will depend on the existence of other outsource companies and the ease of migration.

Being a comparatively small company the level of influence the life company will have over the outsourcer will be limited, especially when it comes to renegotiation of fees or service standards.

Term assurance and whole of life are relatively straightforward contracts to administer and so it may be possible to move them quite easily.

However, it would be better to agree some principles regarding the possible increase in fees in order to reduce the need to move the book again.

There may be brand damage resulting from possible redundancies, as well as the costs associated with such redundancies.

The company will need existing staff to make a success of the migration.

Maintaining morale through the period of uncertainty will be a challenge.

There is a potential for a loss of expertise and with it a loss of product knowledge.

Whilst a substantial section of the company's expense base will have been outsourced, there will be some elements remaining and so there will be some variability left.

The company would need to consider the risk of administration company defaulting.

END OF EXAMINERS' REPORT