

INSTITUTE AND FACULTY OF ACTUARIES

EXAMINERS' REPORT

September 2016

Subject SA2 – Life Insurance Specialist Applications

Introduction

The Examiners' Report is written by the Principal Examiner with the aim of helping candidates, both those who are sitting the examination for the first time and using past papers as a revision aid and also those who have previously failed the subject.

The Examiners are charged by Council with examining the published syllabus. The Examiners have access to the Core Reading, which is designed to interpret the syllabus, and will generally base questions around it but are not required to examine the content of Core Reading specifically or exclusively.

For numerical questions the Examiners' preferred approach to the solution is reproduced in this report; other valid approaches are given appropriate credit. For essay-style questions, particularly the open-ended questions in the later subjects, the report may contain more points than the Examiners will expect from a solution that scores full marks.

The report is written based on the legislative and regulatory context pertaining to the date that the examination was set. Candidates should take into account the possibility that circumstances may have changed if using these reports for revision.

Luke Hatter
Chair of the Board of Examiners
December 2016

A. General comments on the *aims of this subject and how it is marked*

1. The aim of the Life Insurance Specialist Applications subject is to instil in the successful candidates the ability to apply knowledge of the United Kingdom life insurance environment and the principles of the actuarial practice of life insurance to a United Kingdom life insurance company.
2. The Examiners' Report covers more points than would be expected to get full marks. This is so that alternative approaches to questions by different candidates can be accommodated. Whilst candidates are expected to show knowledge of the relevant content of the Core Reading, it is much more important in this exam to tailor answers and apply that knowledge to the specifics of the question than it is in earlier exams.
3. Candidates who give well-reasoned points, not in the marking schedule, are awarded marks for doing so.
4. In this diet the scoring for the exam was done out of 200 and therefore the mark scheme shows a total of 200 marks available for the paper.

B. General comments on *student performance in this diet of the examination*

1. As is to be expected, questions that relied heavily on knowledge, tended to be well answered.
2. However, elsewhere, it was apparent that only the better candidates were able to provide sufficiently broad answers. An example of this was question 1 part (i). The reasoning should include why the company might stop selling annuities, why it might consider developing new products and why it might consider the products suggested. Not all candidates considered all these aspects.

C. Pass Mark

The Pass Mark for this exam was 62%.

Solutions

Q1 (i) Why close to new without profits immediate annuity business

The product may already be unprofitable. [1]

The legislation removes all remaining restrictions on the form in which retirement benefits... [1]

... from personal pension schemes can be taken. [1]

The company may expect that immediate annuity new business sales will reduce following the change in the rules. [2]

More flexibility means that there will inevitably be fewer people deciding to take an annuity on retirement as many will be attracted by the opportunity to have a cash sum. [2]

Particularly for annuities deemed to be trivial in size [1]

The company will wish to avoid anti-selection. [2]

As only those in good health are likely to purchase annuities. [1]

Annuities may be considered bad value for money in the Press... [1]

... due to low interest rates... [1]

... and improvements in longevity. [1]

It may no longer be economical to sell the expected lower volumes of annuities, or due to increasing per policy costs due to needing to cover fixed costs from fewer policies. [2]

It may be difficult for the insurer to decide on future annuity pricing assumptions due to uncertainty about take-up rates and who will buy an annuity post the 2015 change. [2]

The company could have decided to temporarily stop selling annuities until it is clearer what the position is likely to be. [1]

Capital requirements for annuities may be too onerous post implementation of Solvency II. [1]

Why choose to sell alternative products

The company may believe that it can replace profits lost due to not selling without profits immediate annuities. [2]

The company may also benefit from diversification. [2]

Including allowing it to continue to support fixed expenses and overheads, following falls in annuity sales. [1]

The company may be reacting to input from distributors... [1]

... or following action taken by competitors. [1]

Why choose to sell equity release

Demand is growing for these products in the UK... [1]
... due to the aging population... [2]
... strong house price inflation... [2]
... and the reduction in financial support provided by pensions. [2]
Many will have equity built up in their homes. [2]

The company may believe that it can use income from Product B to fund the capital required for Product A. [1]
It may believe that individuals reaching retirement will invest their pension cash sums in property and so increase the potential for this market. [1]

Why choose to sell without profits endowment contracts

The company may believe that demand for such products would be high... [1]
... particularly given the competitive guarantees. [2]
It could be an alternative to an annuity, or for a specific purpose. [1]

The company will need capital to fund the equity release product and it may believe that this single premium product will provide such capital. [2]

The company may believe that it will be offering a niche contract.... [1]
... and as such volumes may be very high resulting in high additional profits. [1]

[Maximum 16]

(ii) Product A

Changes in longevity/mortality relative to expected would increase or decrease the value of the asset [2]
This would be linked to interest rates. [1]
However, this is unlikely to be a significant risk [1]
Assuming that there are profits loaded into the interest rate charged to the customer... [1]
... it is more likely that increased longevity will increase the value of the asset on average... [2]
... since the increase in the loan amount to be repaid should exceed the discount rate used to value the asset... [1]
... hence the present value of repayment of the loan is higher the further away it is expected to occur [1]
However people living longer could exacerbate the risk of the house value being less than the loan repayable. [2]
This is because the loan continues to increase at the fixed interest rate and over the longer term, the loan could overtake the value of the house. [1]
And there is more risk of a house price crash over the longer period [2]
So longevity risk increase the capital required. [1]

Similarly, higher mortality reduces profits, [1]
but reduces capital requirements. [1]

If the assets and liabilities are well matched... [1]
... where the assets are the expected loan repayments under this product... [1]
... and the matched liabilities are either those under Product B... [1]
... or, when the portfolio has grown to a sufficient size, the matched
“liabilities” are the up-front cash amounts paid to new Product A
policyholders... [1]
... then if longevity/mortality is different to expected this would create a
mismatch risk. [2]

Overall longevity is a risk, but it is unclear how significant it is. [1]
Mortality risk increases substantially if the house value is less than the loan. [1]
There is also some mortality risk early on [1]
if initial costs are not recouped. [1]

Product B

The sum assured is payable on maturity or earlier death. [1]
The sum assured will be greater than the premium so there will be a sum at
risk. [1]
Higher than expected early deaths would reduce profits [2]
...there is mortality risk [1]
But it is not a significant risk for this product. [1]
Longevity is not a risk. [1]

[Maximum 10]

- (iii) Consideration needs to be given to Treating Customers Fairly requirements... [2]
... and in particular there should be no barriers to exit. [2]
This means the penalties have to be seen to be fair... [1]
... to both continuing and surrendering customers. [1]
The company should consider the fact that it cannot change the terms of the
penalty without a valid reason. [1]
The penalties should be easy to calculate [1]
And to document and explain to the customer at outset. [2]
- The penalties should reflect future profits/losses that are expected to be made. [2]
... and recouping initial expenses [1]
...and the cost of processing the early redemption. [1]
- The company would consider the penalties imposed by any competitors
offering similar products [1]
The need to appear marketable. [1]
They should be smooth by duration. [1]

They should not change frequently (except when the economic environment changes). [1]
They should be designed to avoid anti-selective behaviour. [1]

Product A

There is a risk that customers repay the loan early when interest rates are low and better rates can be obtained. [1]
The company will make a loss based on the expected future interest on the loan versus the income it would receive on investing the repayment. [2]

Product B

There is a risk that customers surrender the product when they can get a better return by investing elsewhere. [1]
The company will make a loss if it has matched the income and outgo... [1]
... and has to sell assets at a loss... [2]
... or borrow at rates higher than the income from the matched position. [1]
In particular, if it using the equity release assets as matching assets, there is no liquid market for these assets [2]
So the penalty should be related to the difference between the guaranteed rate and interest rates at the time of surrender [1]
It may also include allowance for the cost of borrowing [1]

The company may choose to offset against any penalty the future expected maintenance expenses which are no longer incurred [1]
This would help to ensure that the surrender value did not appear too low compared with premium paid, particularly at low durations [1]
And, for Product B, an allowance for the future additional mortality costs which will no longer be incurred [1]
However the latter may be fairly low so may be ignored [1]
There may be other reasons for the customer to surrender early; if this is the case then if this is at a time when borrowing rates are lower than the guaranteed rate, then no penalty should apply. [1]
The surrender value should run into the maturity value. [1]

[Maximum 12]

(iv) **Product A**

Age
Current interest rates
The fixed rate being charged to the customer

Product B

Outstanding term/duration
Current interest rates/investment returns
The guaranteed rate payable to the customer.

Expected future expenses

[1 mark each, max 2 each product]

[Maximum 4]

(v) **Profitability** [1]

The company is likely to have a defined profit target(s) [1]

For example:

NPV [1]

IRR or return on shareholder capital [1]

DPP [1]

The charging structure / premium rate should be set to deliver the target minimum level of profitability [2]

Consideration should be given to any publicly reported value of new business (e.g. MCEV)... [1]

... to assess the impact on reported values. [1]

The company needs to consider the extent to which the product is required to contribute to overheads... [2]

... and recover the product development expenses. [1]

New business volume estimates will therefore be required. [1]

Assumptions will be required for pricing, including longevity/mortality ... [1]

... and rates of moving into long term care [1]

... and future house price growth [1]

... and a potential lag in the time to sell the house [1]

... and early redemptions [1]

... and expenses [1]

The company needs appropriate assets to back Product B. [1]

The target market may differ from that for its current immediate annuities [1]

It has no or limited existing experience that can be used to set the assumptions [2]

Which may mean needing high margins in the pricing [1]

The company also may need external advice [1]

Marketability [1]

The products need to be attractive to customers [1]

Particularly in comparison to similar products offered by competitors [1]

There will be a trade off between marketability and meeting profit targets. [2]

Product A

The customer will consider the amount of loan available... [1]

... and the interest rate charged. [1]

Competitor's interest rates and loan levels will therefore need to be considered. [1]

The company may need to consider the policyholder's income tax position, eligibility for State benefits and inheritance tax, to ensure that these issues do not reduce the marketability. [2]

[2 marks for any two of these examples, 1 mark for one]

Product B

The premium rates (or benefits available for a given premium) will impact the volumes sold [1]

The company may believe this to be a niche product that does not have direct competition [2]

The guaranteed nature of the benefits should be attractive. [2]

However, the early redemption penalties may reduce the marketability of the product. [1]

And the benefits may appear to be poor value despite the guarantee e.g. due to the low interest rate environment [1]

It will be necessary to decide how many terms to offer. [1]

Suitability for customer needs

In order to be marketable, the products have to be suitable for meeting customer needs [2]

And there needs to be a sufficiently large potential market. [1]

Product A

The product offers cash for those who do not have adequate pension provisions for their needs... [2]

... as such it will meet the needs of those customers in this situation who own their home. [1]

The product offers the customer a lump sum at outset, but some customers may prefer a regular income. [2]

The main downside is the fact that the loan is normally not repaid until after death... [1]

... so the cost is met by the estate of the policyholder which therefore reduces payments to dependants. [2]

Product B

The product offers guaranteed income which may be desirable in these times of low interest rates. [2]

The product leaves the decision up to the customer as to what term(s) to choose. The customer may be unhappy if their funds run out and they have nothing left. [2]

The product appears to offer no insurance against longevity, so does not fully meet customer needs in that respect. [2]

Distribution

| | |
|---|-----|
| The company needs to decide the distribution method to be used | [2] |
| As the existing distribution may not be appropriate. | [1] |
| And how it will be remunerated | [1] |
| Distribution remuneration in both cases is likely be paid up front ... | [1] |
| ... so needs to be covered at outset via an initial expense loading... | [1] |
| ...or it may be paid for directly by the customer to the adviser (as a fee). | [1] |
| Due to the complex nature of both products ... | [2] |
| ... they are likely to require specialist advice... | [2] |
| ... particularly to help the customer assess which terms to choose for Product B. | [1] |
| IFAs are therefore a possible channel through which to sell both these products. | [2] |

Financing and capital requirements

| | |
|--|-----|
| The company needs to ensure that it has sufficient capital to meet the financial and capital requirements of the new products. | [2] |
| Including in the future under Solvency II. | [1] |
| Additional capital may be needed. | [1] |

Product A

| | |
|--|-----|
| Product A requires a significant amount of up front capital to pay for the loan to the customer. | [2] |
| And to meet initial costs | [1] |
| And capital requirements | [1] |
| The company may be relying on funds from the sale of Product B or other existing products to provide this. | [1] |
| If sales of Product B are low, there may not be adequate capital to fund for Product A. | [2] |
| Also the maturity terms chosen for Product B may not match those needed for Product A.... | [1] |
| ... leading either to reinvestment risk... | [1] |
| ... or borrowing/interest rate risk. | [1] |
| The company could decide to convert some of its existing assets (which are currently backing the immediate annuities) into cash in order to fund Product A | [2] |
| However, this may have an impact on the ability to achieve the matching adjustment... | [1] |
| ... and could make the existing business more capital intensive. | [1] |
| Capital requirements under Solvency II may be very high for Product A. | [2] |

Product B

Product B is single premium and so may have relatively low financing requirements. [2]

However, the guaranteed nature of the benefits may require high solvency capital requirements. [2]

Both products

Neither product appears to easily meet the requirements to achieve the matching adjustment. [1]

If the company wants to obtain the matching adjustment it may need specialist advice. [1]

Options and guarantees

The company needs to consider the onerousness of the proposed guarantees [2]

Product A

Product A guarantees a fixed loan rate to the customer. [1]

If the company requires any borrowings to fund the loan, then it is at risk of interest rates increasing. [2]

The company may need to consider hedging this risk if it is high [2]

The company also guarantees that the repayment of the loan will not be more than the value of the house (except on prepayment). There is a risk that the loan is not fully repaid. [2]

The customer has an option to prepay, which may introduce further risks. [2]

Product B

This product offers a guaranteed return to the customer which introduces a risk of not being able to invest in assets to match this guarantee. [2]

The risk is particularly onerous if sales of Product A do not match these guarantees [1]

Sensitivity of profit / Level of risk

The company needs to consider the specific risk characteristics of the products [1]

And the extent of any risk mitigations that could be put in place. [1]

The company will need to test the sensitivity of profits. [1]

Product A

Profits are likely to be most sensitive to house price inflation (due to the guarantee)... [2]

... and to long term care transfer [1]

Profits may also be sensitive to interest rates. [1]

The product introduces significant liquidity risk... [2]
... due to the need to fund the loans with cash up-front. [1]

Product B

Profits will be most sensitive to interest rates (or investment returns on backing assets) due to the guarantees. [2]
There would be credit risk if the company uses corporate bonds as backing assets. [2]

Both products

Sensitivity of profit to surrender rates should be considered [1]
However, this will be reduced by the ability to apply a penalty. [1]
There are risks from new business volumes being greater than expected if the product is too attractive [1]
Particularly in relation to the capital strain under Product A [2]
And there may also be strains on administration [1]
There is an indication that the availability of Product B could be limited, which will help with this [1]
The company may also decide to put limits on the amounts of Product A [2]
There is a risk from new business volumes being lower than expected... [1]
... which will impact expense recovery [1]
There is the risk of higher than expected expenses. [1]
There is likely to be increased operational risk due to the nature of the new products. [1]

Other considerations

Company reputation

The implications for the company's reputation should be considered [1]
And the potential for mis-selling. [1]
And regulatory fines. [1]

Product A

The company needs to ensure that the customer fully understands the implications of taking out this product by making sure that the features are clearly described.... [2]
... particularly the impact on their estate on death... [1]
...and what happens on early pre-payment. [1]

Product B

The company must ensure that the customer understands the difference between this and an annuity which provides an income for life. [1]

Taxation

Taxation may be a complex area for both contracts. [1]
There may be personal tax implications for the customer. [1]

It is important to consider any future potential changes to the tax regulations. [1]

The tax implications for the company also need to be considered. [1]
For example, taxation of the equity mortgage asset may be complex. [1]

Cross-subsidies

The degree of any cross-subsidies needs to be considered [1]
e.g. if there are different profit levels between Product A and Product B [1]
or between small and large policy sizes [1]
This would introduce new business mix risk [1]

Administration, regulation etc.

Admin systems are likely to need updating for the new features [1]
Administration staff need to be trained on the new products... [1]
... in order to ensure that adequate service standards are provided [1]
Sales training will also be required, [1]
New literature will have to be produced [1]
The overall cost of the development will have to be assessed. [1]
The company needs to meet Treating Customers Fairly requirements [1]
i.e. ensure the terms, conditions and charges of the product are understood
Underwriting philosophy is unlikely to be significant for these contracts [1]
Reinsurance could be considered, but is unlikely to be significant. [1]
Outsourcing could be considered. [1]
Admissibility of assets... [1]
... which is particularly relevant for Product A [1]
The possibility of any future regulatory changes or constraints... [1]
... such as charge caps [1]
... or further changes to pensions legislation [1]
Regulatory approval may be required. [1]

[Maximum 60]

(vi) The company should aim to match its cash in-flows and out-flows as closely as possible. [2]

Controls should be put in place... [1]
... to identify when a short term cashflow mismatch could arise such that the company cannot meet its contractual payments to policyholders. [2]
This needs to consider the volatility of non-maturity claim payment timings under Product B [1]
And the volatility of income from the equity release assets [1]

Potential mismatches between loan payments required to customers under Product A and single premiums received under Product B also need to be controlled and identified [1]

Circumstances in which options are likely to be exercised should be identified. [2]

For example Product B surrenders may occur when interest rates are high. [1]

The company should ensure that it maintains adequate liquid assets to allow for unexpected liquidity requirements [1]

e.g. cash [1]

It could put an emergency short term cash access arrangement in place (e.g. line of credit). [1]

Liquidity risk should be included in the company's risk policy... [1]

.. and requirements for monitoring, measuring, reporting [2]

... and limiting the liquidity risk should be set out, [1]

for example by limiting sales of Product A. [1]

The company should incorporate liquidity risk assessment into its risk-based capital framework. [1]

The company should use scenario analysis to assess when there could be a liquidity issue. [2]

The company should monitor any derivative collateral (if used). [1]

[Maximum 8]

- (vii) Absolute trust – this gives the beneficiaries the absolute right to the money or other goods within the trust. It is not possible to change who benefits from the trust after setting it up. [1]

This is unlikely to be appropriate... [1]

... unless the customer has access to the funds before death. [1]

Discretionary trust – this allows the assured to take an income whilst alive and for money in the trust to be left to beneficiaries on the assured's death. [1]

This is appropriate since the assured is able to take an income whilst alive and only pass the remaining funds on in the case of death [1]

The "income" in this case relates to the benefits payable on those tranches which mature before the customer dies [1]

Flexible trust – this enables the amount of money in the trust to be adjusted from time to time while the assured is still alive between the current and potential beneficiaries. [1]

It is unlikely that this is appropriate... [1]

... since this level of flexibility is unlikely to be required for the purposes of ensuring appropriate tax treatment of the benefit on death. [1]

Interest in possession trust – this enables the beneficiaries to have a right to the income paid on the investment in the trust as and when it is given. [1]

This is not appropriate... [1]

... since it is unlikely that this level of flexibility is required for the purposes of ensuring appropriate tax treatment of the benefit on death... [1]

... and it is more likely that the assured will wish to retain the income in retirement [1]

Pension trust – if life cover is effected alongside a pension, this enables the life assured to make an expression of wish naming the person who should receive the money on death before retirement. [1]

This is not appropriate... [1]

... since this is not a pre-retirement product. [1]

[Maximum 10]

[Total 120]

- | | |
|------------|---|
| Part (i) | This was best approached by candidates who considered the change in strategy step by step. Why stop selling annuities, why consider new products and only then considering the reasons for the products proposed. Many simply considered the first part. |
| Part (ii) | There was a tendency for candidates to focus on the longevity risk and the aspects related to the loan value rather than considering other aspects such as ALM implications. The better candidates recognised that it was possible for longevity to increase the value of the equity release asset. |
| Part (iii) | Whilst product A is unusual, the best candidates were able to score well by considering the standard approach for this. However, many only considered the standard points without tailoring to the products in questions. |
| Part (iv) | No comment. |
| Part (v) | Whilst the products are slightly unusual, the better candidates were able to adapt the normal product development considerations for these products. Some were able to recognise that product A might be a suitable investment for other products, not least product B. |
| Part (vi) | Whilst many candidates could identify the various trusts, only a few were able to identify that would be of use in this case. |

- Q2**
- (i) To increase the level of harmonisation of solvency regulation across Europe. [1]
 To protect policyholders. [1]
 To introduce Europe-wide capital requirements that are more sensitive (than the previous minimum Solvency I requirements) to the level of risks being undertaken. [1]
 To provide appropriate incentives for good risk management. [1]
 [Maximum 4]
- (ii) The disclosures which are made privately to the regulator... [1]
 ... are known as the Regular Supervisory Report (RSR). [1]
 The RSR includes
 • The results of the solvency calculation performed under Pillar 1 of the Solvency II regime. [1]
 • The details of the Own Risk and Solvency Assessment (ORSA) performed under Pillar 2 of the Solvency II regime. [1]
 • The details of the risk management processes used by the company. [1]
 The quantitative information is disclosed in a prescribed format using the Quantitative Reporting Templates (QRTs). [1]
 The RSR including the QRTs are submitted annually... [1]
 ... although under certain conditions a summary (material change) RSR is acceptable. [1]
 A subset of the QRTs is required quarterly. [1]
 The publicly disclosed items are reported in the Solvency and Financial Condition Report (SFCR), which is produced annually. [2]
 The SFCR contains extracts of information from the RSR that is not confidential in nature. [1]
 Local regulators are permitted to impose additional reporting requirements in the form of National Specific Templates (NST). [1]
 These address specific requirements of a particular country or local market which are not otherwise covered. [1]
 [Maximum 12]
- (iii) Under the Solvency II regulatory regime the technical provisions are defined as the sum of the best estimate liabilities (BEL) plus the risk margin. [1]
 The unit and non-unit components of the products may be unbundled. [1]
 The BEL may be calculated separately for the unit-linked savings element of the contract and for the guaranteed annuity option (where relevant). [1]

Best estimate liability (BEL) – savings element

For the unit-linked savings element the BEL would be the face value of units attaching to the policy... [1]
... plus a non-unit reserve. [1]

The non-unit reserve is the present value of expected future cashflows [1]

where the cashflows are:

- premiums not allocated to units.
- charges.
- expenses. [2]

[2 marks for all three, 1 mark for two, 0 otherwise]

In order to project future charges expressed as a % of the fund value (annual management charges), the unit fund value will need to be projected. [1]
Assumptions should be best estimate with no prudential margins. [2]
Except for investment returns, which are risk free rates. [1]

The projected cashflows should allow for all expected decrements (including lapses) and policyholder actions. [1]

The cashflows are discounted using the Solvency II risk-free yield curve... [1]
.... issued by EIOPA ... [1]
... for the relevant currency. [1]

It is unlikely that a matching adjustment will apply in this circumstance for the unit-linked savings element of the contract. [2]

However, it may be possible to adjust the yield curve for a volatility adjustment... [2]
....which is based on the spreads of a representative portfolio of assets for the relevant currency. [1]

Regulatory approval might be required for this. [1]

Future premiums can be taken into account up to the “contract boundary”... [2]
... which is broadly defined as the point at which the company can unilaterally terminate the contract... [1]
... refuse to accept premiums or change the premiums or benefits in such a way that they fully reflect the risks. [1]
For this company this would likely mean the selected retirement date. [1]
Expenses need to take into account both overhead and directly attributable expenses ... [1]
... and future expense inflation. [1]
No closure reserve is required. [1]

The non-unit reserve should be calculated on a policy-by-policy basis. [1]

Grouping of policies can be used provided certain conditions are met... [1]
... including validation of accuracy. [1]

The non-unit reserve can be negative. [2]

Best estimate liability (BEL) – guaranteed annuity option

The BEL required to cover the expected cost of the guaranteed annuity option
would likely be calculated using a stochastic approach. [2]
Or option pricing /closed form approach if proportionate [1]

The unit fund would be projected into the future using best estimate
assumptions for decrements. [1]

The investment returns earned on unit funds and interest rates would be the
stochastic variables. [1]
They would need to be market consistent... [2]
... and modelled using probability distributions... [1]
... allowing for different volatilities... [1]
... and correlations... [1]
... and the starting point would need to be consistent with the EIOPA
Solvency II risk-free yield curve. [1]
Withdrawal assumptions may vary dynamically with the stochastic scenario. [1]

The cost of the guarantee would be determined for each simulation as the unit
fund at retirement multiplied by... [1]
... the higher of zero and the present value of an annuity... [1]
... based on {guaranteed annuity rate – simulated market annuity rate}. [1]
The simulated open market annuity rate would depend on simulated interest
rates at the date of retirement [1]
The model will also need to project best estimate longevity assumptions [1]
Allowing for future improvements [1]

A best estimate take-up rate for the option would be assumed... [2]
... and this is likely to be less than 100% since not all policyholders would
take the option even if it is in-the-money. [1]

The cost would then be discounted using the Solvency II risk-free yield curve. [2]

A large number of simulations would be run... [1]
... and the BEL for the cost of the guaranteed annuity option would be the
average over all of the simulations. [2]
The cost of guarantee valuation is likely to be done on a policy-by-policy basis [2]

... to avoid cross-subsidies in the modelling between policies which are “in-” and “out-of-the-money” at the option date [2]
 The calculation will only be performed for those policies which have the option included (i.e. just one version of the product) [1]

Risk margin

The risk margin is determined using a cost of capital approach. [1]

The risk margin calculation involves projecting forward the Solvency II capital requirement on the existing business for the full run-off of the business. [1]

The projected Solvency II capital requirement is a subset of the SCR... [1]
 ... consisting of those risks that cannot be hedged in financial markets. [2]

For this product, this is likely to include insurance risk... [2]
 ... e.g. persistency... [1]
 ... and potentially also longevity risk in relation to the guaranteed annuity option ... [1]
 ... and it will also include operational risk. [2]

These projected capital amounts are then multiplied by a cost of capital rate [1]
 ... which is currently 6%. [1]

The product of the cost of capital rate and the capital requirement at each future projection point is then discounted, using risk-free discount rates, to give the overall risk margin. [2]

As the projection of the SCR is potentially complex, various simplified approaches are available, for example, selecting a driver which has an approximately linear relationship to the required capital component. [2]
 For example, unit reserves for persistency risk. [1]
(Give for any sensible example) [1]
 The projected capital is then approximated as a fixed percentage of the projected values of that driver. [1]

The risk margin could be reduced to allow for diversification benefit... [1]
 ... with the immediate annuity product. [1]

[Maximum 42]

- (iv) The change in the legislation would be expected to reduce the annuity take-up rate (as policyholders can now withdraw the full fund value of their policy rather than having to take out an annuity). [1]

In fact, the rate of annuity take-up would be expected to reduce significantly from the current level. [2]

For the tax-free lump-sum, it is likely that the policyholders will continue to utilise this feature and the proportion of policyholders taking this amount would be expected to remain high. [1]

The level of the reduction in the take-up rate will depend upon a number of factors:

- The level of the fund value [1]
The lower the level of the fund value the more inclined policyholders may be to take the remaining amount as cash. [2]
- Availability of alternative products [1]
e.g. drawdown. [1]
The greater such availability, the less inclined policyholders may be to take the remaining amount as cash. [1]
- Annuity rates in the market at the time of retirement [1]
The more expensive the conversion rate from fund value to pension, the lower the perceived value for money the annuity becomes and the policyholders will be more inclined to take the fund value as cash. [2]
This is likely to get worse as only healthy people will take annuities and so annuities will be re-priced to reflect this. [1]
- Personal preferences of policyholders [1]
They may feel the cash amount gives them greater flexibility ... [1]
...as they could use the additional cash to pay off any remaining loans or mortgages... [1]
..., or to fund any large purchases such as cars or holidays. [1]
- State of health of policyholders [1]
Those in relatively poor health would be more likely to take the cash payment [2]
- Level of advice taken or financial awareness [2]
Policyholders may not fully understand the options available to them... [1]
... they may not have sought professional advice prior to making a decision... [1]
... and may not appreciate that by taking the remaining fund value as a cash amount they might incur more tax than they had appreciated... [1]
... or that by taking the cash amount they may burn through the funds and leave themselves without funds in later life, as opposed to receiving a guaranteed income through life with the annuity. [1]
- The level of tax applied and any tax allowances included [2]
If the remaining funds are taken as a cash amount then they are treated as taxable income. Depending upon the way that the tax system works this may mean that there could be a large tax bill to pay for the policyholder in the year that they retire. [1]

- The level of pension income from other sources, such as state pension [1]
and pension from defined benefit schemes. [1]
If this is high then more cash will be taken and *vice versa*. [1]
- The level of trust in the industry. [1]
If this is low, then more cash will be taken. [1]

[Maximum 14]

- (v) Similar to those policies without a guaranteed annuity option, the rate at which policyholders take the tax-free lump sum should remain fairly stable following the change in legislation. [2]

If the guaranteed annuity option is not in-the-money then the change in take-up rate experience would be expected to be similar to that for the policies without the option. [2]

Assuming that it is heavily in-the-money, then it would be expected that policyholders would still utilise the guaranteed annuity option as that is the more valuable option... [1]

... and that the annuity take-up rate would be similar to that prior to the legislation change. [1]

However, policyholders do not always act rationally and despite the guaranteed annuity option being the more valuable option they may still elect to take the fund as cash. [2]

The extent to which this will happen will depend upon how aware they are of the existence of the guaranteed annuity option... [2]

... and the extent of their understanding of how valuable it is... [2]

... and on their personal circumstances. [2]

As with the policies without the guaranteed annuity option, the actual experience may not be stable initially and may take some time to stabilise to a long term rate. [2]

[Maximum 8]

[Total 80]

Part (i) No comment.

Part (ii) Well prepared candidates answered this part well.

Part (iii) The best answers broke the problem down into constituent parts. Whilst knowledge of Solvency II technical provisions was necessary, only those that applied it to the specific product (unit

and non- unit reserves, annuity option and risk margin) covered all that was required.

Part (iv) Most candidates achieved marks in the general areas; those who did better elaborated further, giving examples where appropriate.

Part (v) Only the better candidates realised that if the option was very in-the-money, then take up rates might not differ much (except on small policies).

END OF EXAMINERS' REPORT