

INSTITUTE AND FACULTY OF ACTUARIES

EXAMINERS' REPORT

April 2015 examinations

Subject ST1 – Health and Care Specialist Technical

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 at the date the examination was set. Candidates should take into account the possibility that circumstances may have changed if using these reports for revision.

F Layton
Chairman of the Board of Examiners

July 2015

General comments on Subject ST1

Candidates who approached the questions, especially the more substantial elements of each question, in a methodical and detailed manner were far more likely to satisfy the examiners and receive a pass in the subject. Candidates will gain few marks if they do not address the question asked. The mark allocation for each question part gives an indication of the relative length of answer or number of points to be made to gain full marks.

It is often helpful to use subheadings when answering long part questions.

Comments on the April 2015 paper

Overall, the paper was of a fairly standard level and well-prepared candidates scored well across most of the paper. As usual, questions that focussed on knowledge of the Core Reading were well answered by those who had prepared thoroughly. However, questions requiring wider thinking or application of core reading to specific circumstances, such as question 6, were often less well answered and students should recognise that these are generally the questions which differentiate those students with a good grasp and understanding of the subject. The comments that follow the questions concentrate on areas where candidates could have improved their performance. Candidates approaching the subject for the first time are advised to concentrate their revision in these areas.

1

It should be noted that no policy will fully protect income.

IP is work related whereas CI is disease related.

The benefit provided from an IP policy will typically be lower than current income. This is partly due to needing to incentivise the policyholder to return to work. IP is less tailored for the self-employed than for employees.

Advantages of the suggestion:

CI premiums are likely to be lower or more affordable than IP premiums because a CI policy will pay out in fewer situations, particularly for younger ages. CI may also be simpler to understand than IP.

CI will pay out in many situations where the IP policy would also pay out (both will provide a payout when someone becomes seriously ill, as defined in the CI contract, and as a result is unable to work).

CI provides a lump sum that can be used for a purpose of the policyholder's choice, e.g.:

- pay off or reduce debt if unable to work
- provide an income (by converting lump sum into regular income)
- adapt the environment to cope with changed physical needs
- pay medical bills
- secure retirement provision
- secure business stability
- fund domestic help
- finance a holiday to assist convalescence
- provide a windfall amount, for any purpose

A cash sum benefit is better suited to impaired lives.

State sickness benefit may not be payable (or paid at a reduced level) when the person continues to receive another form of income, for example the payout from an IP policy, whereas receiving a lump sum payout from a CI policy is unlikely to affect the State benefit that a person may receive.

With an IP policy, the insurer will do some further financial underwriting at the time of claim. This may result in the payout from the IP policy being lower than the amount of cover taken out. This may have led to bad publicity for IP and may present poor value for money to some policyholders for whom benefits are reduced at the claim stage. No financial underwriting is done for CI at the claim stage.

Disadvantages of the suggestion:

Although there is an overlap, these products are designed to meet different customer needs: In particular, CI is not specifically designed to protect income and pays out a lump sum benefit rather than an income stream.

The CI policy will not pay in all scenarios compared to an IP policy. This means that the policyholder's income will not be protected in many illness-related scenarios under CI; for example, if a policyholder is unable to work due to stress or from having back pain.

IP provides income for as long as the person is unable to work but a CI lump sum may not be enough if the recipient is unable to work for, say, 15 years (a typical CI sum insured might provide 4 to 5 times annual salary). It is difficult to convert the lump sum to an income stream because of the uncertain period for which the payments would be required and conversion terms may only produce low income payments. IP payments may be index-linked providing further protection.

IP may provide additional benefits that may help the policyholder to recover sooner e.g. rehabilitation services.

Nothing is paid under a CI policy until after the survival period and this may be longer than the IP deferred period (*or vice versa*).

An IP benefit may fit better with the State sick pay provision and/or the employer's sick pay structure.

IP will pay out again in future even if claimed in the past whereas CI may pay out only once for the same condition, leaving the policyholder at risk in future years unless there are any tiered benefits.

Many candidates scored well on this question. Points less frequently made include the deferred/survival periods involved and linking the benefit to State sick pay provisions, the fact that IP will pay out again whereas CI will finish once a payment (or all tiered payments) have been made and the difficulties in converting a CI lump sum into an income stream.

2

Data

The accuracy of data.

The completeness of data both in terms of missing fields and missing blocks of policyholder data. This will be for both in-force policy data and claims in payment data.

The effectiveness of the current governance and control over the policy data checking process.

The use of automated data checking such as flagging unusual or impossible values.

Evidence of periodic checking of system records against other records.

Carrying out spot checks on data.

The reconciliation between the in-force policy data from the last valuation date with those of the current valuation date e.g. numbers, benefit amounts.

The accuracy and robustness of the movement analysis.

Check the model points, if used.

Methodology

There will be a focus on the materiality/proportionality of the results.
The continuing appropriateness of the inception/annuity approach and consideration of other alternative methods, e.g. multi-state modelling.
The robustness and accuracy of the modelling systems used for calculating the reserves.

Review any changes in the methodology from the previous valuation.

Review any changes in the model from the previous valuation.

The governance around the testing of reserving model changes and developments.

The governance and control over the reserve calculation process.

Any known imperfections or approximations being incorporated in the existing methodology.

Check processes applied for any manual adjustments.

Check that indexation is allowed for correctly and that it differs pre and post-claim, if appropriate.

Check that other product features have been allowed for correctly such as linked claims/survival in deferred period, guaranteed/reviewable premiums.

Check that reserves have been included for claims in payment and for any options/guarantees.

Check that allowance for taxation is appropriate.

Check that allowance for reinsurance is appropriate.

Check methodology against regulatory requirements.

Check against any professional standards.

Assumptions

Review all the assumptions used against actual experience allowing for internal trends or changes and allowing for external trends or changes.

Check the size of any prudential margins.

Compare against assumptions used at previous valuation and consider the justification of any differences. Also, compare against assumptions used by other companies (benchmarking), in particular, both inception morbidity assumptions and termination/duration morbidity assumptions.

The sufficiency of own data for the purpose of experience investigation.

The appropriateness of the chosen period of experience investigation.

The accuracy and robustness of the experience investigation process.

The appropriateness of the treatment of a one-off event or data error.

The choice of external data (such as industry data) to supplement own experience.

The choice of credibility factor applied to own experience.

For groups where data is sparse, the credibility and extent of expert judgement that has been used.

The decisions relating to adjustments to be made to the assumptions following the results of experience investigations.

The appropriateness of economic information used to set assumptions including the yields on the assets held to back this business.

Review of adjustments to yields in respect of credit spreads, if corporate bonds are held e.g. justified against credit rating agency default probability expectations and that inflation assumed for indexation is consistent.
Check the accuracy of the parameters used in the reserve calculation process compared with the assumptions list.

Output

Reconciliation of output data with the policy data input e.g. numbers of policies.
Consider various ratio measures (e.g. reserve/total sum assured) and compare with those of other companies.
The treatment of warnings and errors generated by the modelling systems during the process of reserves calculation.
The robustness of the process for downloading and summarising the results.

May perform spot checks of individual reserve calculations and identify and review any unusual results.
Reconciliation of total reserves from previous valuation date to current valuation date.
Review sensitivity tests and scenario/stress testing.
Reconciliation against other accounting bases (e.g. local accounting standards).
May require a full analysis of surplus.

Knowledge and experience of staff

The relevant knowledge and experience of staff.
The segregation of duties of doers and checkers.

Documentation

The quality of process documentation.
The quality of system documentation.
The robustness of change control.
The existence of robust governance and sign-off processes.

This question was generally not as well answered as Q1. Most candidates mentioned checking the assumptions and how they are derived and also checking the data and the methodology used. However, many candidates did not put down a sufficiently wide range of points to gain a high score, noting the high mark allocation and the "Outline" command word. Few candidates mentioned other items such as checking the relevant elements of the processes and governance procedures, reviewing the output and reconciling the output figures, reviewing the knowledge of staff or the quality of the relevant documentation.

3 **(i)** Profits may be reduced.

Initial expenses tend to be high because of underwriting, initial administration etc. These expenses are often spread across a number of renewals and hence the initial expenses might not have been recouped.

The product may be loss making, if accumulated cash flows are negative at the time of lapse.

The policies have only been sold within the last five years and so the additional lapses are likely to be relatively early duration ones, where the above is more likely to be the case.

The higher than expected volumes of business sold mean that the absolute losses from early lapses will also be greater than expected.

If too many policies lapse, and the loss of business through lapses exceeds the additional new business written, then the company may not be able to cover fixed expenses. In particular, it may not be able to recover the set-up costs of the operation. Similarly, per policy expense loadings may need to be increased. The expenses related to lapses will also increase.

The unexpected additional lapses may be anti-selective, i.e. those in better health are more likely to lapse which means that the average future morbidity experience will be worse than expected. Lapses may also adversely change the underlying mix of business in respect of factors other than health. High lapses mean there is little data going forwards for longer durations.

There may be problems with reinsurers.

Premiums may have to increase which could reverse the good new business experience.

Reserves may have to increase.

The company may get into financial trouble if the high lapses persist and require a capital injection from the mother company.

There may be reputational issues if too many people lapse. This may also hurt new business sales and encourage even greater lapses going forwards although this may not be an issue (for CI) if these occur at later durations where the insurer benefits from a lapse (future expected claims and expenses exceed future expected premiums).

If the reason for the high lapses is linked to mis-selling, then it may lead to regulatory intervention or fines.

The company may need to make changes e.g. to product or sales methods or administration. This is likely to cost money.

- (ii) The high lapse rate may be a feature of the particular market, and all providers experience it.

It might have been a feature of the recent economic environment, where a deep recession in the country has caused higher than expected lapses. This could either be due to individuals not being able to afford the premiums or considering them to be an expendable “luxury” or due to employers lapsing group schemes due to being in financial difficulties.

The commission structure might have encouraged higher lapses or non-renewals e.g. no commission clawback or no renewal commission. The commission could be misaligned to the market – e.g. too high.

The insurance intermediaries in the new country may be more prone to “churning” of business.

The product may not meet well the needs of the consumers.

Brokers may have mis-sold the product or not explained it sufficiently well.

The successful advertising may have generated a lot of interest and high sales but now the consumers are not happy with the product once they have a better understanding of it.

For group business, the employers may feel that the products did not fulfil their aims e.g. of attracting and retaining key staff.

There might have been some incentive to buy the product initially, but customers lapse when this incentive is no longer present e.g. free gym membership for first six months of the contract or a supermarket voucher when the policy is in force for three months.

Initial expected lapse rates may have been mis-estimated and, having only been in operation for five years, there has not been a sufficient volume of own experience gathered yet to update those expectations.

The insurer may not have been able to access data relevant to these products in this country. Hence it based the assumption on its own domestic experience data, but failed to adjust appropriately for the features of the local market. For example, there may be cultural differences to renewals in the new country.

The company may have used industry statistics for the new country, but these were out of date or for a different product, etc.

The company might not have used duration-specific lapse rates, and it is generally expected that persistency is lower near the start of a contract.

The premium structure might encourage non-renewals e.g. there is a steep increase on renewal of PMI, if the CI products are written on reviewable rather

than guaranteed premium terms or if what is covered by the policy has been reduced.

Customers might be switching to other providers in the new market who have launched new products or made existing ones cheaper or added new critical illnesses that this insurer does not cover but which consumers see as valuable.

There may have been new entrants to the market.

The development of alternative distribution channels within the country may exacerbate a move to competitors as may the development of price comparison websites.

There may be lapse and re-entry if the product design or pricing has been changed internally.

The insurer might have received bad publicity in the new country e.g. high level of declined claims or its financial strength might have reduced materially.

Customer service standards may not have met the expectations of the customers e.g. though language issues/communications problems.

Financial underwriting was not sufficient, and customers were unable to continue to afford the premiums.

For PMI, the actual levels of claims incurred might have been low thus leading policyholders to question the value of renewing.

The mix of business sold might have been different from that expected e.g. more younger ages (for which persistency tends to be worse) or by gender mix.

More business than expected may have been based on cash premiums rather than direct debits.

More monthly premium business was sold rather than annual premium business (there are more opportunities to lapse monthly premium business).

More high premium business was sold than expected, which was harder for policyholders to continue to afford.

State healthcare (or welfare benefits) may have improved in the country.

There may have been tax changes (e.g. on premiums) or regulatory changes e.g. employers no longer having to offer group PMI/CI cover.

This question involved applying knowledge to a specific scenario and was generally well answered, although some candidates simply stated that the lapses may be anti-selective without explaining what this means.

In part (ii) few candidates suggested possible reasons for lapses of group IP. Only the better candidates recognised that the lapse rates may have been initially mis-estimated and so suggested the potential reasons for this.

- 4** **(i)** Could include **Proportional reinsurance**, under which the reinsurer covers an agreed proportion of each risk.
Can be facultative or obligatory/treaty. If facultative, the insurer does not have to reinsure each risk, but the reinsurer would typically have to accept all such cases.
Can be based on sum insured or sum at risk.
Can be written on a quota share basis, whereby the proportion ceded is a fixed proportion of each risk or on a surplus basis, whereby the proportion ceded is based on the excess over the retention for an individual policy.

Can provide income in the form of reinsurance commission (from reinsurer to insurer).

Can be on original terms (coinsurance) reinsurance where the insurer premium and claims are shared in equal proportion or risk premium reinsurance where the reinsurer charges specific own premium rates for the risk reinsured. The premium may be level over the term of the policy or may vary annually with the probability of claim and may be guaranteed or reviewable.

If written on original terms there may be a deposit back.

Could include **Non-proportional reinsurance**, under which the reinsurer insures risks over/between limits rather than a specified percentage.

May be **Risk/Individual Excess of Loss (XL) reinsurance**.
This caps the cost of a large claim, the liability above a certain level being passed to a reinsurer. There may be an upper limit above which liability for the excess reverts back to the insurer. The limits may be indexed.

May be **Catastrophe XoL**.
This reduces exposure to claims arising from a single cause or single (catastrophic) event.

May be **Stop loss/Aggregate excess of loss**.
This reduces the insurer's exposure to a poor performing portfolio from all causes or events over a given period e.g. a year.

Financial reinsurance could be included.

This involves limited risk transfer and is primarily a means of improving the apparent accounting position of the cedant. Unlike a loan, the liability for repayments does not need to be shown in the supervisory returns. Repayments are added to the reinsurance premiums and spread over a number of years or are contingent on the future profits generated by a block of new or existing business.

(ii) Reinsurer strength and comparison

Obtain the statutory returns/*accounts* of this reinsurer and a selection of others providing health and care reinsurance.

Calculate measures of its financial strength e.g. solvency margin, claims paid, premiums received and also compare these to other reinsurers of a similar size.

Obtain credit ratings for the reinsurer from recognised rating agencies (e.g. Standard and Poors) and compare this with the ratings of other reinsurers which could be used.

Examine trends over time.

Compare the size of the reinsured portfolio relative to that which other insurers place with this reinsurer.

Consider the diversification of the reinsurer and compare with the diversification strategies of other similar reinsurers.

Obtain estimates of the probability of default of this reinsurer and estimates of the likely recovery given default. Also, investigate any historical/recent reinsurance defaults.

Obtain reports or opinions from consultants.

Explain any movements in financial strength and reinsurance strategies in the context of the business cycle.

Consider the stated views of the CEOs of the reinsurers, particularly any warnings of changes in strategy, markets or financial strength.

Identify any measures that are in place to obtain early warning of any impending changes in the reinsurer's strength.

Information on retrocessions in place.

Consider the country of residence of reinsurer and strength of regulation there.

Balance sheet implications

Investigate the potential balance sheet impacts if the reinsurer failed including an estimate of the likely degree of recovery of any reinsurance claims owed.

Investigate in particular the implications of default for the solvency level of the insurer.

Investigate the extent of any collateral arrangements.

Identify and assess any other strategies that are in place to mitigate or reduce the counterparty risks.

Examine the effect of any limits on the supervisory balance sheet benefit obtained from reinsurance if it is concentrated with a small number of reinsurers.

Understand the effect of any recent or impending changes in the regulations.

Identify the amount of risk-based capital that has to be held in respect of this element of counterparty risk. Compare this with the capital held for other risks, in order to assess its relative importance and with the amount of capital that would have to be held if the reinsurance was more diversified.

- (iii) Retain the full range of reinsurance but place it with another stronger reinsurer or in a different country. Alternatively spread the reinsurance across several reinsurers e.g. place the different types of reinsurance (e.g. catastrophe v original terms) with different reinsurers.

Introduce bands in the non-proportional cover and use different reinsurers for each band.

Negotiate a better treaty with the current reinsurer.

Coinsure with another insurer operating in a different target market or with different product lines.

Use other types of industry pooling of insurance risk.

Stop using treaty reinsurance and place everything on a facultative/facultative basis (*or vice versa*).

Retain treaties for the standard reinsurance and use facultative arrangements for the non-standard reinsurance.

Reduce or increase the amounts of reinsurance placed overall.

Use a different mix of reinsurance (e.g. less quota share, more catastrophe).

Stop reinsuring new business or stop using any reinsurance.

Hold higher reserves/capital to reduce the need for reinsurance.

Set up a captive reinsurer.

Redesign and/or reprice the whole range of products and only offer benefits that the insurer is capable of accepting, given its size and solvency position and/or diversify into different products, target markets etc to change the types of reinsurance required (or to reduce the need for reinsurance).

Limit high sums insured (to reduce the need for reinsurance).

Reduce need for reinsurance by changing underwriting/claims management approach.

Require a deposit back/collateral if not already doing so.

Pass risk to capital markets e.g. use securitisation/cat market solution.

Rely on any State protection.

- (iv) There is more potential for gaps between layers of cover e.g. if different reinsurers index limits at different times or rates.

Reinsurance may not be available when required or at an acceptable price.

Premiums may have to increase if the alternative reinsurance arrangements are more expensive. Therefore new business sales could fall and/or profits could fall and there may be an impact on the embedded value.

Delays in obtaining reinsurance could lead to reputational risk if the issuing of an insurance policy has to be delayed.

Administrative complexity of dealing with several reinsurers and their different requirements including the need for training. There will be differences in terms and conditions, definitions etc. System changes may also be required. Also, administrative complexity of having to obtain quotes and select the best and then agree terms etc so may need more and/or higher skilled admin staff. Administrative costs will increase.

There could be a loss of in-house skills e.g. in administering the treaties, making it difficult to revert to the previous strategy later on.

There may be a loss of relationship with the reinsurer and the loss of any other services this reinsurer provides e.g. technical assistance with underwriting.

It could become more difficult to obtain and analyse data.

Regulatory approval may be required for any change.

If the new strategy involves an overall reduction in reinsurance cover then experience risk increases (more volatile claims experience) and profits may be more volatile. There is also an increased risk of insolvency. This may not be consistent with the shareholders' risk appetite / may have an adverse market reaction (if listed).

There may be higher reserves and capital requirements.

There may be higher new business strain which may reduce capacity to write new business.

The ability to write large individual risks may be restricted.

Premium rates may need to increase if they previously benefited from reinsurance tax/solvency arbitrage.

Any product redesigns may not be marketable.

Alternative solutions to reduce risk bring other problems e.g. more underwriting/claims underwriting/more rejected claims. Because the company is small all of the options may not be available.

Part (i) was a standard bookwork question which was well answered although some candidates discussed the advantages and disadvantages of using reinsurance which was not asked for in the question.

Part (ii) was well answered although few candidates made many of the points on balance sheet considerations.

Candidates also generally did well on part (iii), although most candidates only discussed alternative reinsurance strategies; few candidates discussed alternative methods of risk control, such as coinsurance, redesigning products or moving to products which were less volatile or which required less reinsurance.

Similarly part (iv) was also generally well answered with many candidates providing a wide range of points. Practical issues, such as relating to increased administration complexity and costs, were generally not well covered.

5

The company is likely to use its existing profit test cash flow model unless it is no longer appropriate.

The company will need to select a set of model points representing the expected new business under the product. The model points should be split by (or reflect) appropriate rating factors. It could use its profile of historic new business to set model points but allowing for any expected changes in the future.

The model needs to be amended to allow for any new features. Model points that would be appropriate to these new features could be derived using the profile of a similar product or by taking advice from the marketing department.

For each model point, cash flows will be projected which value premiums plus investment return less claims less expenses and allowing for reserving and solvency margin requirements. The time steps to be used will need to be considered.

Premiums will be projected only for the period for which they are contractually payable e.g. to a certain age or when the claim is triggered or possibly under a less severe disability level.

Modelled claims will need to take into account any waiting or deferred period, and will be modelled as annuities in payment once inception. If any additional benefits are provided, such as the cost of assistive devices, these also need to be modelled.

Assumptions will start from best estimates and a risk margin may be applied (depending on the approach taken to risk loading).

Assumptions will be required for morbidity, i.e. the expected claims trigger rates and there may also be recovery rates modelled although mortality is likely to be the main cause of claim termination. Different levels of benefit may be triggered by different levels of disability, so multiple triggers may need to be modelled.

Although it is unlikely that a death benefit is offered mortality assumptions are required both before disability and in disability (to model claim terminations).

Although it is unlikely that a surrender value will be offered lapse rates will need to be modelled to ensure that the model allows for the profits that can be made on lapse (or losses at early durations). Lapse assumptions may vary by duration.

Paid-up rates might also be required if a reduced benefit is paid in these circumstances.

Expense assumptions are also required covering initial, maintenance and claim expenses. The cost of independent care advice at the point of claim might also be included, if provided as a support service within the product. Contributions to overheads will be spread over new business.

The assumptions will be based on own data and on the most recent investigations allowing for any known distortions in the investigations and any likely future changes both internal and external. For example, the demographic assumptions may need adjusting if the reprice is likely to change the customer profile from that in the past. External data may be required if own data are not credible (e.g. LTCI inception rates).

Appropriate commission terms based on expected future commission rates would be allowed for.

Economic assumptions will be required: investment returns which should be based on the underlying assets held, e.g. fixed interest bonds, index-linked bonds and may vary before and after claim. An assumption for expense inflation will be required and an inflation assumption appropriate to the indexation of the benefit amount which may apply prior to claim inception as well as during payment of the annuity. This might be derived from the yields on index-linked gilts.

Valuation assumptions will also be required for the reserves.

A risk discount rate is required, which may take into account the return required by the company; and the level of statistical risk attaching to the cash flows under this particular contract. In theory, a separate risk discount rate should be applied to each separate component of the cash flows as the statistical risk will differ. The risk discount rate and economic assumptions should be set consistently.

The projections may be done on a market consistent basis or may be consistent with the embedded value reporting basis of the company (if applicable).

Reinsurance would be allowed for, if applicable, including reinsurance premiums and recoveries. The company will also need to consider whether reinsurance terms need to be renegotiated as a result of the repricing, and allow for any revised terms in the profit test.

Allow appropriately for tax.

Any regulations would need to be complied with.

A profit criterion will be set e.g. NPV/IRR/DPP.

The premium will be set so as to produce the required level of profit. This may be considered in aggregate, as the desired level of profitability may not always be reached for all individual model points.

Other factors will then be considered (e.g. market comparisons) before the final premium rates are set.

There is a need to avoid potential for lapse and re-entry.

A check/reconciliation against the previous premium rates would be carried out.

An analysis of the sensitivity of profit to changes in assumptions (using the profit test model) would need to be conducted to assess any risks inherent in the premium rates.

This question was not particularly well answered, despite being heavily based on Core Reading. This was mainly through candidates not providing a wide enough range of points given the marks available and omitting detail. For example, few candidates described how the discount rate would be chosen.

- 6** (i) The embedded value is the present value of the future shareholder profit stream from the company's existing business, together with the value of any net assets that are separately attributable to shareholders.
- (ii) Considering first the likely impact on the projected reserves of each change:

Reduction in long duration lapse rates for CI

For these policies reserves will most likely be positive/late duration lapses generate profits for the company due to expected claim outgo and expenses exceeding expected premium income, unless the product is priced very uncompetitively.

A reduction in expected lapses at long durations means that more policies will be projected to remain in this deficit position (alternatively, that lower late-duration "lapse profits" can be anticipated) and so reserves will increase for these long duration policies.

Increase in early duration lapse rates for CI reserves

It is reasonable to assume that the company writes profitable new business and so at early durations reserves can be negative/early duration lapses lead to losses for the company.

The impact on these early duration reserves depends on whether the company allows for negative reserves or only allows for positive reserves (i.e. minimum of zero).

Case: Allows for negative reserves

If the company allows for negative reserves then the increase in the assumed early duration lapse rate will cause the reserves to be less negative (due to

lower future expected profits) so there will likely be an increase in reserves for these early duration policies.

Case: Allows only positive reserves

If the company holds only positive reserves (i.e. zeroises negative reserves) then the increase in lapse rates may have limited impact on reserves for policies at early durations as they are still capped at zero (if they remain negative).

Impact on net assets:

There is no change in the value of the assets.

The total reserves are expected to increase (as described above). This is consistent with the “more cautious” nature of the approach as indicated, i.e. the reserves are more prudent. Hence there will be an immediate reduction in net assets.

If negative reserves are zeroised then this reduction will be lessened (since the reserves may be unchanged for such policies). However, overall it is still likely that there will be a reduction in net assets across all durations.

Impact on present value of future profits (PVFP):

The increase in the reserves will be released in each future time period in the PVFP (since the best estimate assumptions are unchanged).

Equivalently, as the reserving assumptions have been strengthened and the best estimate assumptions have not been changed, the margin between the two sets of assumptions has increased and this higher margin is released in each future time period in the PVFP. The result is an increase in the present value of future profits component of the embedded value.

Overall impact on embedded value (EV):

The change in EV would not be expected to be significant.

If the discount rate used in the EV calculation is the same as the assumed rate of investment return, then there would be no change to the EV. However, if the discount rate is higher than the assumed rate of investment return, as is likely, then the embedded value would reduce. This is because the increase in PVFP would be less than the reduction in net assets (due to the discounting).

Equivalently, the higher reserving margins mean that profit emergence is deferred. The reduction in EV (if the discount rate exceeds the assumed earned rate) represents the extra “lock-in” cost due to this deferral.

In either case the overall impact depends on the percentage of the overall portfolio.

(iii) Impact on net assets:

The impact on net assets will be the same as in part (ii).

Impact on PVFP:

The impact on PVFP of the change in reserving assumptions will be as described in part (ii), i.e. an increase.

Reducing the best estimate lapse assumption for business that has been in force for many years will worsen the expected deficit of claims and expenses relative to premiums at these late durations, and reduce future projected profits, following similar reasoning as mentioned in part (ii).

At the early durations one would expect future premiums to exceed expenses plus claims so a policy lapse will result in a loss of this income.

Increasing the best estimate lapse assumption for early durations on critical illness policies means that the company will expect more policies to terminate at these durations, hence reducing the level of anticipated future profits. Thus the changes in best estimate assumptions will reduce the PVFP. This is particularly the case for the early duration change.

The overall net impact on the PVFP will depend upon how the margin between the reserving and best estimate assumptions changes. If both the realistic and reserving assumptions change by the same amount, then the PVFP remains broadly unchanged. If the margin increases then the PVFP will increase. For example, this could occur if the reserving morbidity assumption was to be set using a 10% margin above the realistic assumption.

Overall impact on EV:

Irrespective of the change in prudential margin, the most significant impact will be the reduction in net assets and hence overall the EV reduces by a significantly greater amount than for part (ii).

Part (i) was standard bookwork; however several candidates did not mention the shareholder aspect of the definition i.e. that it is the value of future shareholder profits plus the net asset value attributable to shareholders.

For parts (ii) and (iii) even when candidates were able to define EV, they struggled to connect it to the situation and product described in the question. Although some candidates were able to describe what the effect of more lapses at shorter durations and fewer at longer durations would have on profits and reserves, many were unable to then show understanding of what the effects would be on the net asset values or the present value of future profits and hence on the EV itself.

END OF EXAMINERS' REPORT