

INSTITUTE AND FACULTY OF ACTUARIES

EXAMINERS' REPORT

April 2021

Subject SA2 - Life Insurance Specialist Advanced

Introduction

The Examiners' Report is written by the Chief 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.

Paul Nicholas
Chair of the Board of Examiners
July 2021

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

1. The aim of the Life Insurance Specialist Advanced subject is to instil in the successful candidates the ability to apply knowledge of the life insurance environment and the principles of the actuarial practice of life insurance to practical situations for a 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 make well-reasoned points, which are not in the marking schedule will receive credit where appropriate.

B. Comments on *candidates' performance in this diet of the examination.*

1. Whilst there were some knowledge based questions, such as 3(vi), they did require some application of that knowledge. So, for 3(vi) as an example, it was necessary to consider the standards that would apply outside of the UK, so quoting UK standards without qualification did not gain marks.
2. A further example of candidates not considering the question set was 2(ii). The question related to an analysis of change of Best Estimate Liabilities (BEL). Some candidates discussed an analysis of surplus.

C. Pass Mark

The Pass Mark was 58.

425 candidates presented themselves and 161 passed.

Solutions for Subject SA2 – April 2021

Q1

(i)

Term assurance is a simple product	[½]
With competitive pricing	[½]
So normally lends itself to direct marketing such as	[½]
comparison websites	[½]
telesales	[½]
With simple underwriting	[½]
Such as online application form	[½]
This would keep costs down to help maintain competitive prices	[½]
However, the company already sells individual pensions through advisers and so has existing relationships there	[½]
It has also sold with-profits policies in the past and are therefore likely to have relationships with a distribution channel of some form for these policies.	[½]
Given the complexity of WP direct marketing is unlikely to have been used	[½]
It may be possible to mail existing customers	[½]
This could be tied or multi-tied agents or the same financial advisers as for the individual pensions	[½]
possibly through bank networks	[½]
Although Financial Advisors are unlikely to be appropriate for such a simple product and low commission	[½]
The company could look to utilise these existing relationships to sell the new term assurance product	[½]
But the target market may not match up	[½]
Or different product features or pricing may be required for these channels	[½]
Setting up a new channel will incur costs	[½]
Regulation may restrict what distribution options are available	[½]
Any sales channel will need a robust sales process that meets regulatory requirements	[½]
Persistency may vary by different sales channels, which may impact decision	[½]

[Marks available 11½, maximum 6]

(ii)

The main data shortage is relevant mortality experience	[½]
Although expense data may also be lacking	[½]
The individual pensions policies it has may provide some data as a starting point	[½]
As the age profile may be similar	[½]
Or the with profits policies may offer some relevant experience	[½]
But the experience of these policies is likely to be different from the experience on term assurance as the target markets are likely to be different	[½]
depending on distribution channel chosen for term assurance	[½]
Therefore an adjustment would need to be made to any data taken from existing policies	[½]
Even if the with profits policy experience could be used as a base, any data complications arising from some of these policies being from outside the UK may restrict its use.	[½]
External data sources are an alternative source to base assumptions on for pricing	[½]
e.g. reinsurers	[½]
industry data	[½]
such as standard tables	[½]
Consultants	[½]

Again an adjustment to reflect the expected target market and how it differs from the lives
 this data is from would be required [½]
 In addition a further margin for uncertainty could be added [½]
 Though the extent of the margin may be restricted by the need to remain competitive on
 pricing [½]
 Alternatively, premiums could be made variable [½]
 or the sum assured might be capped [½]
 based on the age of the insured life [½]
 [Marks available 10, maximum 5]

(iii)

The company would first analyse the impact it expects the legislation to have on the WP fund
 capital [½]
 This will depend on the extent of guarantees on these policies [½]
 which will depend on original sum assureds [½]
 and the regular bonus declared on these policies today date [½]
 And expected future regular bonus [½]
 It will also depend on outstanding term of the policies [½]
 Although it may not be possible to significantly alter the level of guarantees [½]
 Action suitable for the company to take will depend on the outcome of this analysis, i.e. the
 additional capital expected to be required in 5 years time [½]
 If the impact is expected to be small or additional capital only expected to be held for a short
 period of time then the company may not take any action [½]
 The additional capital should be expected to be released over the remaining policy term if no
 best estimate assumptions have changed [½]
 If the impact is expected to be larger, then the company would look at actions it could take to
 reduce the impact of this extra capital [½]
 Unless the company is particularly well capitalised [½]
 Or if the amount of with-profits business is small in relation to the rest of the business [½]
 The impact may be reduced by any transitional arrangements permitted [½]
 and the speed of implementation [½]
 The company should check to see if the changes impact other lines of business [½]

The company could:

Adjust the balance between regular bonus and terminal bonus [½]
 or reducing the level of regular bonus declared (same effect) [1]
 increasing the terminal bonus proportion reduces the future guaranteed proportion of the
 bonuses and so expected future capital increase [½]
 The company may start to make these changes now to reduce the guarantees that exist in 5
 years time rather than wait until the new regulations come into effect [½]
 The investment mix may need to change to reflect this change in bonus strategy [½]
 Changing investment mix is likely to be a secondary action as this is driven by the bonus
 strategy [½]
 Though changing the investment mix may allow a different discount rate in the reserves
 (depending on the regulations currently and in future) which could help reduce the overall
 capital required [½]
 This might involve moving to less risky assets or a more matched position [½]
 or hedging possibly with the use of derivatives [½]
 The company could increase the charges on the policies [½]
 with justification of the increased cost of capital in future [½]

which would reduce the future capital required compared to current expectations	[½]
This could go against expectations policyholders have built up	[1]
depending on previous actions taken	[½]
Customer documentation may restrict the ability to change charges	[½]
The Principles and Practices of Financial Management – or any other equivalent communications – should be considered	[½]
Any changes would need to be assessed in terms of fairness to policyholders	[½]
and the more significant actions should be communicated to customers	[½]
The company could consider actions to improve capital efficiency	[½]
such as cost cutting, model improvements, (any reasonable example)	[½]
The company may require a capital injection, after all other action is taken, to meet the increased capital requirements	[½]
If this is the case they will need to identify where this will come from and begin action to put this in place	[½]
If the company is a mutual, it might consider demutualisation to gain access to capital markets	[½]
The company might investigate whether it is possible to convert the with-profits business to non-profit before the new regime comes into force	[½]
In the extreme, the with-profits business might be sold	[½]
Any reasonable example	[½]
Consider reducing the level of smoothing to reduce the capital required for smoothing or, similarly, more closely target asset shares when setting MVRs.	[½]
Adjusting smoothing is unlikely to mitigate the impact of this regulation change	[½]
as this mainly impacts the level of terminal bonus which is not guaranteed	[½]
Any actions will need modelling to determine the expected impact	[½]
Models may need changing to be able to do so	[½]
Any actions may need approval from the WPC	[½]
And WPA will need to be consulted	[½]
The company could lobby the regulator to change the proposals	[½]

[Marks available 26½, maximum 10]

[Total 21]

1 (i) and (ii) These were answered well by candidates who adapted core knowledge to the specific circumstances set out in the question.

1 (iii) Candidates who thought widely for possible actions scored well.

Q2

(i)

The company will have priced in a profit margin	[½]
expect to make a profit through the experience being better than the pricing assumptions	[½]
insurers may feel they know more about annuitant mortality than competitors and are able to better predict life expectancies	[½]
and are able to price the scheme effectively using the actual member data	[½]
such as taking into account the members' location, job, gender, etc.	[½]
additionally, the insurer will look to make profits may investing the premium received strategically	[½]

so, rather than investing in 'safe' assets such as government bonds to meet the annuity payments	[½]
they may invest in more risky assets which have the potential to provide a higher return	[½]
the company may be able to achieve economies of scale relative to the pension scheme	[½]
the company may be required to hold relatively less capital, for example through diversification of risk	[½]
the pricing may make prudent assumptions on dependents benefits	[½]
[Marks available 5½, maximum 3]	

(ii)	
Opening position	[½]
prior year reported BEL	[½]
restatement of opening position	[½]
any changes to the reported position such as issues spotted post reporting	[½]
unwind of reserves to the current reporting period	[1]
rolling forward allowing for discount rate	[½]
which is the risk free rate	[½]
possibly allowing for any matching adjustment or volatility adjustment	[½]
and expected mortality	[½]
and allowing for benefit inflation	[½]
and expense inflation	[½]
experience variance	[½]
adjustment from expected rate of inflation and replace by actual benefit inflation over the period [½]	
current year expense inflation	[½]
adjustment from expected rate of expense inflation and replace by actual expense inflation over the period	[½]
mortality experience	[½]
moving from expected in force policies to actual	[½]
actual vs expected deaths will result in profit or loss	[1]
for both member and widow	[½]
and whether known widow or made an original estimate of widows age/sex	[½]
and whether made an assumption about marital status	[½]
change in future assumptions	[1]
future maintenance expenses	[½]
reassessment of future expenses will change reserves	[½]
future benefit inflation	[½]
change in expected future inflation will impact future benefit inflation	[1]
change in valuation interest rate on reserves	[½]
change in any matching adjustment/volatility adjustment	[½]
or introduction of matching adjustment/volatility adjustment once approved	[½]
change in view of future mortality/longevity	[½]
which may be driven by general trends in the industry	[½]
or specific details on the mortality of the scheme members	[½]
any new schemes written over the year will be added as new business	[1]
any changes due to regulation changes	[½]
any unexplained gap in the analysis	[½]
closing reserves at the year-end	[½]
[Marks available 20½, maximum 14]	

(iii)

Longevity improvements

Strengthening of the longevity assumption will impact 'change in assumptions' [½]
and the reserves it needs to hold will be higher [1]

Expenses higher

if the expenses are higher than those allowed for in the renewal expense assumption, then the expense assumption may need to be changed [½]
if the change is expected to continue [½]
which will impact 'change in assumptions' [½]
which will increase future reserves [½]

Deaths higher than assumed in pricing

There would be an experience variance [½]
lower reserves would need to be held as there would be fewer annuities in force [½]
it may also be necessary to adjust the mortality assumption [½]
to increase the mortality assumption [½]
which would reduce reserves [½]

(iv)

Pricing model may differ from the valuation model [1]
for example, different timing of cashflows (any reasonable example) [½]
pricing model may assume cashflows all occur mid-month, whereas reserving may allow for when annuities are actually paid [½]
the methodology might not have been fully developed when the business was originally priced [½]
assumptions may be applied differently [½]
for example, single investment yield vs yield curve [½]
single inflation rate vs inflation curve [marks for any sensible example] [½]
the reserving team being more likely (than the pricing team) to allow accurately for any MA/VA if relevant [½]
the needs of the model differ [½]
for example, the pricing model may not need to be as accurate for reserves [½]
scheme data may have been interpreted differently [½]
for example, benefits may have been created differently in both models [½]
for example, the pricing model may assume benefits escalate in X month whereas valuation may have set all schemes to escalate in the same month [½]
for example, there may be different treatment for dependents [½]
timing difference on assumptions [½]
such that different assumptions are used in the models [½]
such as different assumptions for dependents [½]
reserves may be determined approximately in the pricing model [½]
for example, for groups of policies rather than policy by policy [½]
or the data is different in some other way [½]
one or other team may have made an error [½]

[Marks available 11, maximum 6]

[Total 29]

2(i) The question specifically asks about how the life insurance company might **expect** to make a profit, so candidates who considered commented on the inclusion of a profit margin and how a life insurance company might be better placed to manage bulk annuities than the pension scheme (better placed to assess mortality and longevity, for example) scored well.

2(ii) Some candidates misread the question and considered an analysis of surplus so some points made in these cases were not valid. So, for example, points around actual to expected investment returns or expenses do not change the BEL analysis of change unless the assumptions change. Actual to expected benefit inflation does as it changes the BEL at the year end.

2(iii) Again, some candidates answered this from a surplus perspective, rather than the impact on the BEL. For example the different expenses would impact the surplus, but would only impact the BEL if it led to a change in assumptions.

2(iv) Candidates who recognised that the approach (ie model, data, assumptions) taken to determining the BEL for pricing might be different to that for reserving scored well. However, as both are trying to determine a best-estimate rather than prudent or pricing basis liability candidates who suggested that, say, the pricing team would use prudent assumptions, with no qualification, did not receive marks for this. Both the pricing and the reserving teams should be aiming to use the same assumptions (best estimate) but they may adopt different approaches for practical reasons.

Q3

(i)

Consumer protection	[½]
the types of product that can be sold	[½]
including product approval	[½]
how products are sold	[½]
the information that must be provided to policyholders	[½]
and when that information should be provided	[½]
how advice is provided and paid for	[½]
who is allowed to sell/provide advice products	[½]
how that advice is paid for	[½]
mis-selling	[½]
pricing	[½]
e.g. price/charge caps	[½]
who can is appointed to senior management roles	[½]
how products can be underwritten	[½]
e.g. anti-discrimination (e.g. inability to price differently based on gender)	[½]
basis for valuation of assets and liabilities for regulatory valuations	[½]
capital requirements	[½]
the type of assets that might be held	[½]
what currency matching is required	[½]
what counterparty exposure is permitted	[½]

there may be restrictions on transfers to shareholders	[½]
especially for with-profits business	[½]
there may be restrictions on passing liabilities/surplus between legal entities	[½]
there will be requirements relating to data protection	[½]

[Marks available 12, maximum 5]

(ii)

The standard formula prescribes a number of risks (“modules” and “sub-modules”) for which capital must be held	[½]
for each of these a prescribed stress is performed	[½]
according to detailed rules	[½]
equivalent to 1 in 200 event	[½]
as a one year value at risk	[½]
the capital required for each individual risk is the difference between the net asset value in the unstressed balance sheet and the net asset value in the stressed balance sheet	[½]
these individual capital amounts are combined across the risks within a module using a specified correlation matrix and matrix multiplication	[½]
a further specified correlation matrix is used to combine the capital across modules	[½]
an adjustment may be made for the loss absorbing capacity of the technical provisions	[½]
the loss absorbing capacity is the ability to reduce discretionary benefits under stressed conditions	[½]
capital for operational risk is added	[½]
this is based on percentages of earned premiums and technical provisions	[½]

[Marks available 6, maximum 4]

(iii)

Use of an internal model must be approved by the regulator	[½]
must still cover the same risk types as for standard formula	[½]
insurance companies must show they meeting certain tests and standards as part of their internal model approval	[½]
use test	[½]
demonstrate it is used within the company	[½]
statistical quality standards	[½]
minimum standards for assumption setting and data	[½]
calibration standards	[½]
assess whether equivalent to 99.5% Value at Risk over a year	[½]
profit and loss attribution	[½]
how the categorisation of risk chosen is used to explain sources of profit/loss	[½]
validation standards	[½]
fully validated and regularly reviewed	[½]
documentation standards	[½]
allowance is made for non-linearity	[½]
and non-separability of risks	[½]
internal models can use stochastic simulations rather than stresses	[½]
calibration of the models requires care and expertise	[½]
probability distributions should properly reproduce more extreme behaviour	[½]
the standard formula may be used for some risks	[½]
in a partial internal model	[½]
for example, operational risk	[½]
the model can be tailored to the company's specific risks	[½]

risks can be aggregated using copulas rather than correlations [½]
 an internal model can allow for dynamic hedging [½]
 [Marks available 12½, maximum 6]

(iv)

This will be for practical reasons mainly [½]
 smaller companies might not have the skill [½]
 and the resources to implement an internal model [½]
 and so forcing them to do so would be disproportionately expensive for such companies [½]
 the standard formula is aimed to be appropriate for the average company [½]
 so may result in the level of capital required for some companies to be disproportionately large [½]
 if they have effective internal risk management processes in place [½]
 or it does not fit with the company's risk profile [½]
 or the company is non-typical [½]
 for these companies, the additional cost of operating an internal model may be justified by the lower capital requirement [½]
 these companies are likely to be larger companies [½]
 or smaller simpler companies [½]
 alternatively, the standard formula may result in the company being under capitalised [½]
 if the company has non-standard risks [½]
 the regulator may not have the resources to approve internal models for all companies [½]
 so this relieves the regulator from this [½]
 equally, the regulator would not want to lead to the industry being unnecessarily over capitalised by using a simple one-size fits all approach [½]
 the use of the two approaches balances effective prudential capital requirements [½]
 with an appropriate regulatory cost for the industry [½]

[Marks available 9½, maximum 5]

(v)

All business advantages

All additional reporting using new regime will be consistent over all business (e.g. ORSA) [½]
 the run-off of the transitional arrangements is over an arbitrary fixed term [½]
 this may be good or bad for some companies [½]
 It may provide a boost for the industry with the full regime giving additional confidence [½]
 it may provide equivalence for Solvency II, helping international companies [½]
 complex products are better reflected under new approach [½]
 better for the regulator as all business is assessed under the improved regime (gives them more meaningful information) [½]
 allowing a transitional adjustment is beneficial for everyone [½]
 allows an orderly market [½]
 the regulator would prefer a predictable transition to the new regime [½]

All business disadvantages

it could possibly lead to some companies becoming insolvent [½]
 even with transitionals [½]
 this would be bad for the regulators as it does not lead to an orderly market [½]
 the transitional arrangements lead to additional development [½]
 it may be difficult to interpret the new rules for some legacy business [½]

the data necessary for the new regime may not exist [½]
 there may be additional difficulties needing to take into consideration implementation of IFRS 17 in parallel (extra strain on resources) [½]

New business only advantages

It gives time for the regulator to resolve issues that arise in the regulations [½]
 and gives more model refinement time for companies [½]
 introducing for new business only is likely to be easier [1]
 and so cost less for companies [1]
 also it needs less resources [½]
 the run off of the old regime using the new business only approach is over the life of the existing business [½]
 companies may find this more appropriate [½]
 and possibly easier for regulator too [½]
 it might help to focus on potential issues with regime for new products, where more likely to be able to make changes [½]

New business only disadvantages

This may lead to a long transitional period [½]
 which may not be in the interests of the regulator [½]
 the new business only approach requires multiple valuation processes to be in place [1]
 all the new regulatory reporting (like ORSA) will only apply to new business? [½]
 risk management processes within the company might be different between the two blocks of business [½]
 although, for relatively new companies, new business only might be more difficult [½]
 as such companies may prefer one basis [½]
 This increases ongoing complexity for both companies [1]
 and the regulator [1]
 and costs more [½]
 there may be practical difficulties such as how treat increments [½]
 it might put companies off launching new products – which is bad for the industry [½]
 the regulator doesn't get to see the company as a whole under the new regime [½]
 for example, it would not reflect risk diversification between existing and new products appropriately [½]
 what disclosures would be required [½]
 complexity would be further increased if the statutory disclosures were different for the two blocks of business [1]
 different public disclosures may be difficult to interpret causing confusion [½]
 which would make it difficult for market analysts [½]
 there would be tax implications which may be an advantage or disadvantage to either method [½]

[Marks available 25½, maximum 9]

(vi)

The Actuary will need to abide by the principles of the Actuaries Code. [½]

The Actuary will consider the requirements of APS X1 [½]

sets out the principles to be applied to determine which standards must or should be applied	
APS X2	[1/2]
consider the extent to which a piece of work requires review	[1/2]
including independent peer review	[1/2]
any standards operating in territory X	[1/2]
such as speaking up or conflicts of interest	[1/2]
in the absence of any recognised technical standards in territory X, consider if the UK Technical Actuarial Standards would be appropriate	[1/2]
guidance issued by other actuarial professional bodies in territory X should be followed alongside any Institute and Faculty of Actuaries guidance	[1/2]
[Marks available 5, maximum 3]	
(vii)	
In both approaches, the reserves are likely to be split between unit reserves and non-unit reserves	[1]
there may be differences in the level of policy data required	[1/2]
either grouped on individual policy level	[1/2]
there is unlikely to be much difference between the unit reserves	[1]
in both reserving approaches, a non-unit reserve will be required to be held for the difference between the value of the expenses in administering the policy and the value of the policy charges	[1]
under the prudential approach, the assumptions will be conservative	[1]
assumed expenses will be higher than expected	[1/2]
assumed inflation will be higher than expected	[1/2]
assumed mortality will be higher than expected	[1/2]
the unit growth rate assumed to determine the charges will be lower than expected;	[1/2]
under the best estimate approach, all assumptions will be best estimate assumptions without margins	[1]
except the unit growth rate, which will be risk free rate	[1/2]
for all funds, irrespective of the AMC	[1/2]
the discount rate is likely to be risk-free in both cases	[1/2]
the prudent approach may prescribe that all policies remain in force until maturity	[1/2]
the best estimate approach will make an assumption about surrender rates	[1/2]
the prudent approach may prevent the non-unit reserve from being negative	[1/2]
in any case	[1/2]
or only where there are other positive non-unit reserves to offset them	[1/2]
as this product will be profitable, the annual management charge will partly be required to recoup initial costs	[1/2]
so will exceed ongoing costs	[1/2]
so the best estimate non-unit reserve is likely to be negative for this product	[1/2]
whereas the prudential non-unit reserve may be positive, due to the margins in the reserving basis	[1/2]
or limited to being non-negative	[1/2]
in any case, the prudential reserve will be higher	[1]
but a risk margin will be included in the technical provisions, so this may counter some of the above	[1]
under the new regime, contract boundaries may also lead to significant differences	[1/2]
[Marks available 17, maximum 9]	

(viii)

The company's charge income is dependent upon the size of the unit fund	[½]
and so the company is exposed to market risk	[1]
particularly, the company is subject to the risk of low returns	[½]

Subject to the assets held in the internal unit-linked funds there may be

Equity risk	[½]
Property risk	[½]
Interest rate risk	[½]
Spread risk	[½]
Currency risk	[½]
Concentration risk	[½]
these are likely to contribute significantly to the statutory solvency capital requirement	[½]
the company is at risk of increased withdrawals	[½]
due to the loss of future profits/charges	[½]
so lapse risk would contribute significantly the statutory solvency capital requirements	[½]
the company is exposed to expense risk	[1]

Expenses being higher than expected

to some extent, depending on any outsource agreements for administration and investment management	[½]
so expense risk is likely to contribute to the statutory solvency capital requirements	[½]
similarly the company is exposed to inflation risk	[½]
expense / inflation risk is exacerbated if charges are not variable	[½]
there is some mortality risk	[½]
especially early on	[½]
as the company would not receive the surrender penalty on death	[½]
but it is not likely to be a significant factor in the statutory solvency capital requirements	[½]
counterparty risks may exist	[½]
there will be operational risk	[1]
such as unit pricing (any reasonable example)	[½]
there may be liquidity risk	[½]
particularly for property investments	[½]
there may be some new business risk, for example, if it impacts per policy expenses	[½]

[Marks available 15½, maximum 9]

[Total 50]

3(i)-(iii) Candidate generally scored well on these parts.

3(iv) Candidates that explained why a “one size fits all” approach may not be appropriate scored well.

3(v) Candidates who considered the suggestions from both company and regulator viewpoints scored well.

3(vi) Candidates who recognised that this was an IFoA member operating outside the UK scored well. Marks for TAS were only awarded if the candidate noted that there may not be recognised actuarial standards in the territory in question.

3(vii) Most candidates recognised that prudential reserves were likely to be higher than best estimate. However, candidates that gave a more full description and recognised that this might be offset by the risk margin scored well.

3(viii) This was generally well answered by well-prepared candidates.

[Paper Total 100]

END OF EXAMINERS' REPORT