INSTITUTE AND FACULTY OF ACTUARIES

EXAMINER'S REPORT

September 2011 examinations

Subject SA3 — General Insurance
Specialist Applications

Purpose of Examiners' Reports

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 who are 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. Although Examiners have access to the Core Reading, which is designed to interpret the syllabus, the Examiners are not required to examine the content of Core Reading. Notwithstanding that, the questions set, and the following comments, will generally be based on Core Reading.

For numerical questions the Examiners' preferred approach to the solution is reproduced in this report. Other valid approaches are always given appropriate credit; where there is a commonly used alternative approach, this is also noted in the report. For essay-style questions, and particularly the open-ended questions in the later subjects, this report contains all the points for which the Examiners awarded marks. This is much more than a model solution – it would be impossible to write down all the points in the report in the time allowed for the question.

T J Birse
Chairman of the Board of Examiners

December 2011

General comments on Subject SA3

Consistent with previous examiners reports, the examiners would offer candidates two key pieces of advice – read the question properly and take the time to think about what is going on.

On the first issue, candidates should always work on the assumption that the question wording has been carefully chosen. It is therefore essential to read the question accurately.

If something is not asked for then candidates will waste valuable time writing answers that will gain no marks. These broader answers may be a logical next step to the question and so may be appropriate for candidates to discuss in a professional context. However in an exam with a finite number of marks available the scope must necessarily be limited and specifically defined.

If a question specifically mentions something, candidates should also assume that there are definitely marks available for this aspect of the question. During the exam setting process, any content that is superfluous should have been removed.

Wording of question parts should also be considered in the context of the position within the overall question. Where new question information is provided between parts, candidates should recognise that this information is specifically relevant to the following part or parts.

Various examples from this paper of recurrent failure to read the question are below.

On the second issue, candidates should note that SA3 is the key paper at which candidates broader thinking is tested. This is generally the final paper before qualifying as a professional, and a capacity for broader thinking is one of the best indicators of a candidate's suitability to act in a professional capacity once qualified.

As such exam papers are designed so that it is difficult to pass without displaying some capacity for independent and broad thinking, as well as to reward instances where these skills are displayed. When reviewing past papers, candidates should assume that the marks available for generic points are substantially less than those awarded for the more challenging points that would be the mark of high quality professional insight in a practising actuary.

Even among passing candidates, this capacity for broader thinking is not always in evidence. The examiners strongly recommend that candidates step back and take the time thoroughly to think about what is actually going on in the question situations posed rather than simply considering numbers to be analysed with standard techniques. For example, candidates might stop to think in detail about claims for a particular class of business, considering factors such as what causes the claim, who brings the claim, how it is dealt with once brought, what makes one claim small while another is substantial, etc.

This more grounded, real world perspective will help candidates to consider such things as practical issues, stakeholders involved and their potentially diverging objectives, wider impacts, regulatory or ethical issues, inappropriateness of certain actuarial techniques for the specific situation, current economic or cyclical effects, etc. This is likely to lead to generation of broader points (and indeed reflects the thought processes of the examiners in drafting the questions and solutions) and a more rounded understanding of the underlying risks and dynamics which should also be of value to candidates when dealing with different stakeholders in their professional life.

Again, some examples of this failure to think more widely on the current paper are below.

As in every subject, there is a need to employ basic exam techniques such as well structured answers and effective time management.

Comments on the September 2011 paper

Overall performance on this paper was reasonable, as reflected in the above average pass rate for this session. Performance on each of the questions was similar, with the more unusual question 1 appearing to have sufficient depth of content in the question to allow competent candidates to respond to an unusual situation.

On question 1 however, some candidates did not seem to understand fully the nature of funded / PAYG cover in spite of the detail given in the question. Even where candidates did understand, only the better candidates displayed an ability to think through the full range of implications of different funding bases to the various stakeholders, although most candidates were good on more practical and generic issues.

Candidates are advised to take the time to consider scenarios presented in SA3 papers and think about what is happening throughout the full process and for all stakeholders. This consideration should lead to generation of the wider points necessary to demonstrate higher order skills and obtain a high mark in this paper.

In question 1 part (ii), some candidates discussed the entire press release rather than the immediate statement before this section of the question. In question 1 part (iii), a number of candidates discussed solutions where the question only asked for details of the issues and their importance.

In question 2 part (i), many candidates did not correctly identify that the question considered expected rather than past profits and so missed most points available for issues relating to changes in risk. In question 2 part (iii) a number of candidates failed to mention Solvency II in spite of this being very clearly indicated within the question.

More generally on question 2, the better candidates structured their answers well and considered issues relating to each business line in turn rather than providing generic answers across all lines. This generated more points and tied their answers more closely to question specifics, which is highly advisable exam technique for all papers, particularly SA3.

1 (i) *Premium Components*

(a) *SunInsure Costs*

Premium needs to cover:

Expected claim payments during the coming year (regardless of when the accident occurred)

SunInsure's expenses during the year

Costs can be net of investment income earned during the year

(b) *Private Insurer Costs*

Premium needs to cover:

Expected claim payments for accidents occurring during the year, whether or not those amounts will actually be paid during the year

Claims handling expenses, including a provision for expenses payable in future years

Commissions and brokerage

Net cost of reinsurance

Profit margin (possibly including an allowance for contingencies)

Costs can be net of investment income earned on reserves

Candidates would have benefited from a clearer articulation of claims costs and timings under each of the two systems. Many candidates failed to discriminate between costs PAID for SunInsure and costs INCURRED for private insurers.

(ii) *Comparison of private and SunInsure premiums*

PAYG and funded represent very different bases of setting premiums.

The two bases cannot be directly compared.

Differences in premium in the current year reflect timing differences in funding claims costs, rather than indicating that one sector is more efficient than the other.

Example of how PAYG and funded premiums might compare. For example, in a fast growing population, PAYG premiums would be less than funded premiums.

It is unclear whether PAYG premiums would be lower than funded premiums at the present time.

There may be differences in efficiency of private sector insurers and SunInsure.

Private insurers may have less leverage in purchasing services from providers than SunInsure, due to loss of scale. This could result in higher claim costs for private insurers.

It is plausible that the motivation of higher profits could lead to greater efficiency in terms of claim costs and claim handling expenses under a private sector than a public sector model.

The number of accidents that occur at work is a key driver of claim costs. It is not clear privatising the workers' compensation insurance market will have any impact on this.

Private insurers may however be able to provide more innovative products which incentivise lower claims, for example, offering no claim discounts.

SunInsure charges the same premium to every employer in an industry, so there would appear to be limited reward for good claims experience under the current system.

There would also be no recognition of other distinguishing risk features

For example some companies may have greater automation and their wageroll may be more skewed towards high value added development work rather than higher risk direct manual work.

If Industry groupings are relatively broad, there may also be significant differences in the underlying work carried out between different businesses in the same industry.

Conversely, the move to a private sector approach would mean each insurer having significantly lower data volumes and may reduce the accuracy of the overall market premiums.

Overall, the scope for savings under a private sector model would depend on the current level of efficiency of SunInsure, which is unclear.

The private and SunInsure models have different expense bases.

Under the private system there would be:

> Duplication of overheads with multiple operators – for example, multiple IT systems.

Commissions and brokerage, which are not necessary where there is a monopoly provider.

Marketing expenses – for private insurers to attract customers.

Private insurers will need to charge a profit margin to achieve a return on capital, whereas SunInsure is a not-for-profit business.

If private insurers purchase reinsurance, there will be profit margins in the reinsurers' premiums.

In terms of expenses and profit margins, a public sector monopoly represents a lower cost model than private competition.

Overall, it is impossible to say whether the Minister's statement is correct given the information presented.

Some limited credit available for additional valid points not on the marking schedule.

Many candidates failed to offer a balanced assessment of how costs might increase or decrease in both the short and long term, with PAYG systems often having hugely distorted short term cashflows.

(iii) *Scheme viability*

Residual Funding Issues:

Need to consider how claims for prior accident years will be paid.

SunInsure does not have any assets to pay these claims, as it collected premiums on a PAYG basis.

Under the PAYG model, only employers that remain with SunInsure will need to pay for these claims.

The greater the number of employers leaving SunInsure, the higher the premiums needed for remaining policyholders.

These high premiums will encourage even more employers to switch to private insurers, leading to further price increases and lapses.

If SunInsure loses all its policyholders it will be unable to pay claims, meaning workers' will not receive compensation.

Government may be called upon to pay for these liabilities.

Possibly a separate levy could be made on all employers to cover historical liabilities.

Funding Future Accident Years:

The proposal might also be more viable if SunInsure moved to a funded basis of premium calculation.

SunInsure premiums may be much lower than private insurer premiums, or vice versa.

This could be because of the difference between PAYG and funded premiums.

Alternatively, this could be because of other structural differences,
for example, the required profit loadings

Or other relevant example of efficiency
Consequences of differences in premiums:

Few employers would choose a private insurer if SunInsure was cheaper.

In this case, SunInsure would remain a monopoly as private insurers would be unable to compete.

Having insurers with funding policies (PAYG and FF) competing is unlikely to work in practice.

Under the Minister's proposal, SunInsure will continue charging average premium to each industry, whereas private insurers can risk rate individual employees.

This will allow private insurers to "cherry pick" the employers with better than average claims experience.

SunInsure will be left with poorer than average risks, and need to increase premiums commensurately.

Increases in premiums means the private insurers appear more competitive, leading to the loss of more business for SunInsure.

Insurer Failure:

Need to consider what will happen if a private insurer fails.

The Minister should consider the compensation arrangements that are appropriate in this case.

Suninsure has implicit government guarantee as a public insurer, so may be regarded as a safe option for employers.

Data / Competition Issues:

Consider what information will be made available to private insurers to determine premium rates.

In particular, consider whether SunInsure will be required to share its historical data.

If not required to share data, SunInsure may have an unfair advantage.

Data may not be available for risk rating individual employers, as SunInsure has not previously priced at this level.

Private insurers may include large contingencies in the premiums if good pricing data is not available.

Sunland is a small country – will enough insurers be interested in writing employers' liability for the market to be viable?

Consider whether private insurers have the necessary pricing skills.

Specialist claim handling and other staff may also not be available.

Consider whether private insurers have sufficient capital available.

Will reinsurance be available for the insurers?

If there are too few competitors, profits may be excessive, or there may be no incentive for efficiency.

Need to ensure that all employers will be able to get insurance, so that compensation will be available to workers.

For example, will private insurers be obliged to provide cover to any employer requesting it.

Consider whether there should be maximum premiums set by government.

Consider the level of regulation needed.

Will all private insurers be allowed to write employers' liability insurance, or will there be an insurer accreditation scheme.

Consider whether existing private insurer capital requirements are appropriate for writing employers' liability business.

What is the minimum level of cover that private insurers need to provide.

May be a poor outcome for workers if employers may purchase inferior cover.

Need to make sure private insurers are incentivised to return workers to work (optimal for workers and society) rather than just minimise cost.

SunInsure will need to be regulated too.

Private insurers will need to understand the level of political interference/oversight in the market.

The best candidates recognised that the key practical issue was the potential gap in coverage caused by switching from SunInsure to a private insurer. If SunInsure was to cover incurred claims this would have a knock-on effect as the costs would have to be met by the remaining policyholders only which in turn would exacerbate their funding problems.

Most candidates covered the more practical issues such as lack of data, Regulation and systems and personnel requirements although not usually in sufficient depth to score well.

2 (i) The experience of the 6 classes of insurance will have seen some changes in claims experience over the last 15 years due to the companies expansion,

especially those related to processing, which has driven a large proportion of the expansion, i.e.
EL, Business Interruption and PL

Some of the other classes will not have been impacted as much.

The changes in claims experience will have to be analysed, and if there have been nil claims for any classes this will prove difficult.
Also, where classes would be expected to be exposed to spike or catastrophe losses volumes of these claims may be low.

Claims should be analysed in terms of claims frequency, severity, causes, and trends.

In each class they would need to consider relevant rating factors and exposure measure.

Fleet Insurance

Exposure measure in this case will be vehicle years.

The experience over the past 15 years should be a good guide allowing for the marginal increase in staffing levels, and therefore marginal increase in vehicles being used. Although it should be fairly easy to get this accurate data from the company itself.

Even if number of vehicles is similar the average mileage per vehicle would need to be checked, especially if changes in processes have meant changes in types of vehicles used and distances of distribution.

The more granular the claims analysis the better.

This can be achieved by splitting by:

- Vehicle type
- Claim type (bodily damage/property damage/ TPL)
- Size of claim (attritional/large/catastrophe)

(the benefits of such analysis will be being able to identify the differing levels of inflation required – especially between PD and TPL, and between attritional and large claims)

Employers Liability Insurance

The exposure measure to use here would be payroll, which would be easily available.

Although they would need to allow carefully for the amount of salary inflation over the last 15 years as this will significantly increase the likely claims sizes.

Again the experience over the past 15 years may be a useful starting point for looking at attritional type claims,
as long as the marginal change in staffing has been even across all employee types,
and that there has been no significant changes in working conditions, and health and safety.

Rating factors would need to be considered in terms of any changes to processes impacting on types of industrial diseases which may arise, e.g. have innovations increased the likelihood of industrial deafness, or chronic obstructive pulmonary disease for example?

It may be difficult to say much about the likely impact of such latent claims, given you only have 15 years data.

But could benchmark against industry data especially for companies using similar material & processes.

They will need to allow for any large /abnormal claims in the data, or lack thereof.

They changes in processes could have also resulted in a change in the mix of staff and hence payroll, so an analysis of payroll by skill types would help identify change in exposures.

Commercial Fire

Exposure measure – sum insured

Manufast has tripled its output in 15 years, so they will need to check whether this has been achieved with increases in manufacturing sites even if the staffing levels have only marginally increased.

This will dictate how different the exposure change would be.

The rating factors would need to be considered in terms of:

- Construction types of buildings
- Age of buildings
- Health and safety procedures e.g. fire doors in place

Will need to consider whether the innovation in production processes have changed the risk profiles of each building.

This could include:

- Changes in value of machinery
- Changes in types of material used
- Any other appropriate examples

As in other lines, the analysis would need to consider any large single fire claims in the past data. If these do not exist in the data, they could look at market statistics for similar types of operations to see if the premium loadings are appropriate for expected large losses.

Business Interruption

Exposure measure would most likely be turnover or profit.

This could have been volatile in the past 15 years.

The fact that the company has expanded 3 fold in the last 15 years will need to be factored into the analysis as this will result in larger claims from such cover.

This type of loss will only occur after a major loss, and as such the firm may not have any in their claims experience to date,

Although this is likely have been allowed for in their premiums.

Given its expansion it is likely that the company have changed their BCP plans over the last 15 years and as such the premiums for such cover may appear inflated.

The fact that the firm have improved processes may mean that the new processes are more difficult to replace/restart etc., and this will need to be allowed for.

Have they specialised – e.g. do they do different bits of a process at different sites with dependencies between sites so that fire in one site prevents others from operating effectively.

How many different sites do they have & safety processes (overlap with commercial fire)

Are stocks held separately

How specialised is the machinery – can it be replaced relatively quickly or does it need to be built from the ground up

What stock levels do they operate with / how long could they continue to trade for using stock products

How specialised are the products – i.e. can customers just switch to someone else leading to long term consequential loss of business

What coverage terms are in place – indemnity periods, retention of part of the claims costs

Trade type often used as a rating factor

Contract terms with suppliers / break clauses / penalties etc.

Goods in transit

Exposure measure would be sum assured for shipping, number of journeys or overall turnover.

Would need to consider relevant rating factors:

- Method of transport
- Distance travelled
- Frequency of transit
- Internal/external shipping
- Retention of an interest in the goods shipped
- Choice of packing method
- Use of in-house / contract delivery teams
- Recovery potential from third party shippers / transfer of liability
- Salvage potential for goods damaged in transit

The previous claims experience should be a good guide as long as rating factors have not changed significantly.

But this would depend on the nature of the expansion and process changes which have taken place.

Public Liability

Exposure measure would be turnover.

Would need to consider relevant rating factors:

- Number of premises
- Number of external visitors
- Environmental exposure
- Excesses
- Deductibles
- Policy limits
- Territories covered (based in UK but potentially has sites outside?)

The experience now is likely to be very different from that 15 years ago, due to potentially increased floor space, processed used, number of external contractors etc. As such these will impact on claims experience likely in the future. So analysing trends in claims experience relative to square footage/ number of contractors as well as turnover will be important.

A number of candidates suggested looking at insurer FSA returns to identify expected profit. It is unclear how this would be of use unless this was the insurer's only customer.

(ii) A captive is an insurer wholly owned by an industrial or commercial enterprise and set up with the primary purpose of insuring the parent or associated group companies.

Thus retaining premiums and associated risks within the group, as such this is a form of self insurance.

Some captives are set up with the primary purpose of selling insurance to the customers of the parent;

Or they may insure other non-group companies if they have the expertise.

(iii) Advantages:

- Retains insurance profit within the group, which could potentially improve profitability for the consolidated group.

- Could increase awareness of risks within the company and as such improve risk management practices

- Captive would be subject to Solvency II and as such should be deemed equivalent to many reinsurance companies' regulatory requirements around the world.

- Reserves and premiums are built up as pre-tax profits

- Could also sell products to customers of the company, hence improving profits further.

- Gives them direct access to the reinsurance markets with all the associated expertise.

- Could select against the insurance market during harder markets, by increasing retention in the captive.

- May allow access to wider range of insurance products.

- Although Manufast's parent is considering setting captive up in UK, if they are flexible in terms of where the captive is domiciled they may be able to take advantage of certain tax benefits, e.g. in Bermuda

- Reduces insurer credit risk

Disadvantages:

- Could increase volatility in group's results depending on the amount of reinsurance purchased by the captive.

- There may be a large accumulation of risk, depending on which other group entities the captive is insuring.

- Complex to set up

- Costly to set up and subsequently run

    - Lack of internal expertise,
    - Lack of policy/claims administration
    - Lack of claims handling etc.
    - May be mitigated to a degree by getting external management to run it?

- Need to think of requirements of Solvency II if authorising in the UK, which brings its own issues:

    - How will the proportionality principal of Solvency II be applied to captives?

    - The issue of standard formula versus internal model for calculating capital requirements would need to be considered , and if internal model route is taken this could be very costly in terms of validation.

- o If they chose the standard formula and opted for the simplified basis the captive would only be allowed to underwrite risks for entities owned by the parent.

- o The governance requirements would increase and the captive would need to develop policies and systems around such things as transparency, risk management and compliance functions.

- Ties up group capital which may reduce returns in terms of opportunity costs

- May be a stretch on management time which could be best utilised else where.

(iv) The level of capital held by the captive is an important consideration as it will impact on the captive's ability to attract business (if trading independently from the group).

The parent will need to think carefully about the balance between capital employed in the captive against the return achieved elsewhere within the business.

To assess the capital required to set up the captive they will have to think about the current capital regime, but also how Solvency II would impact the capital required (and also system requirements)

Current requirements:

- The capital requirements will firstly depend on whether the captive will only be used as a pure captive, i.e. writing only business for the parent, or whether it will write business outside of the group.

- If it will operate as a pure captive then the capital requirement may be relatively low, depending on where the group is domiciled. This is due to the fact that as a pure captive this self insurance will be equivalent to internal group accounting.

- It will be required to hold the MCR (statutory minimum capital requirement) and test this against an ICA. If ICA is larger then its ICG will be set at this amount. The level of ICG will be determined by the risks which the captive writes, as for any other insurer. The captive will have to ensure that it can cover its capital requirement at all times.

- If it is going to write business outside of the group then it will have to assess its capital requirements under ICAS, and this is likely to be more thorough than the assessment for a pure captives, due to the policyholders being wider than just the group.

- As such it is likely that the capital requirement for a pure captive will be less than that for an independent trading entity.

- To assess the likely quantum of capital required they will need to look at:

    - Initial costs of setting up the captive
    - Lines of business to be written
    - Initial volumes of premium
    - Growth targets
    - Profit margins within premium rates and related adequacy of premium rates
    - Tax on those profits (varying by region)
    - Volatility expected within the business lines
    - Reinsurance program likely to be used
    - Technical help from reinsurer
    - Retained risks
    - Value of RI
    - Reduction in volatility via use of reinsurance
    - Associated credit risk
    - Reserving methodology including consideration of adequacy of reserves
    - What investments they are likely to hold, and how the investment strategy will be set
    - Potential for liquidity risk should be assessed
    - What operational risks are likely to be present and how these are best mitigated

- They will also have to think about the requirements placed on captives from Solvency II and how this may change the capital requirements.

- The captive will need to consider whether it will use the standard formula or an internal model to calculate its SCR. This will depend on the size and complexity of the writes being underwritten in most cases.

- It is likely that using the standard formula will result in an increase in capital requirements due to the typically undiversified nature of captive business.

The best candidates recognised that they needed to consider both the general issues relating to capital required (line of business, reinsurance etc.) as well as issues specific to this subsidiary being a captive.

(v) When setting up a new subsidiary there are many administrative issues that need to be considered as part of the application process.

Policy administration – is this going to be handled internally or outsourced? If internal what administration system

Policy wordings

Claims management – is this going to be handled internally or outsourced?

If internal, what system will be used to administrate, and what claims adjusters/claims handlers will be used?

Expense administration

Premium collection

Administering legal fees

HR issues (e.g. different reward / performance management structures required for an insurance business)

Regulatory administration (e.g. application for licenses)

Few candidates scored well with most missing obvious practical and administrative issues.

(vi) Product liability insurance indemnifies the insured against legal liability for the death of, or bodily injury to a third party, or for the damage to property belonging to a third party, that results from a product fault.

The basic benefit provided by such liability insurance is an amount to indemnify the policyholder fully against a financial loss.
This benefit may be restricted by:

- A maximum claim amount per event
- A maximum aggregate over 1 year
- An excess
- Insured retaining a proportion of any claim
- A maximum amount per claim

The perils covered will depend on the nature of the products being manufactured, but may include

- faulty design,
- faulty manufacture,
- faulty packaging,
- incorrect or misleading instructions

The policy will also normally cover legal costs.

Policies are normally written on a claims-made basis.

Some policies may also include product recall for products which have not actually caused any damage.

Overlap of content between parts (vi)–(viii) was taken into account in marking, with candidates scoring the relevant marks whichever question the points were recorded against. Generally candidates performed well on this section understanding the difficulties of low data volumes and potential latency.

(vii) Pricing issues:

- Firstly need to consider what rating factors will be used.

- These are likely to include:

    - Nature of product
    - Distribution channel used
    - Whether there is US exposure, due to the risk of greater litigation, torts etc.
    - Use of product
    - Materials used within product
    - Testing completed on product
    - And associated risks of failures

- In order to derive a risk premium, there is unlikely to be any internal data available to assess the cost of claims.

- Therefore need to look to an external market source to identify appropriate data to use, this could be via reinsurers or external consultants.

- Should consider premiums being quoted by other insurers for similar products, taking into account whether there exists differences in the scope of the cover offered.

- Once a technical risk premium has been estimated would need to allow for:

    - Commissions
    - Expenses
    - Profit
    - Contingencies
    - Tax
    - Reinsurance costs
    - Capital requirements
    - Investment return

- To make these allowances for expenses would need to look at projected volumes of exposure – in this case turnover, and then consider per policy, and per premium loadings. The cost of handling claims and administering policies can be compares with that for similar products.

- Would need to look at whether this resulting premium was be competitive/ any anti-selection issues.

(viii) Claims issues:

- Several issues need to be considered when looking at any liability claim, i.e.
- whether or not there has been a loss,
- whether the insured is actually liable,
- and the quantum of the loss

- Need to consider what claims information should be kept for administration purposes but also for future rating of the product.

- Need to consider the likely quantum of notification and settlement delays involved.

- Aggregation of claims, if one particular product fails.

- Likely legal costs involved in litigating claims.

END OF EXAMINERS' REPORT