

**Subject ST3 — General Insurance
Specialist Technical**

EXAMINERS' REPORT

September 2008

Introduction

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

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Chairman of the Board of Examiners

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Comments

Individual comments are shown after the solutions to each part question that follow.

- 1** (i) Greater risk is associated with greater variability, and hence a larger probability of ruin
Purchasing excess of loss reinsurance will reduce claim volatility and therefore reduce the probability of ruin.
The effect on the insurer depends on both the retention level and the reinsurer's profit load/cost of reinsurance
Consideration of different types of reinsurance (Individual/ Aggregate/ Catastrophe).
Layers of reinsurance may be needed to give full coverage / other comment about layers.
Buying reinsurance is a trade off between profit and volatility – reinsurance will reduce the claims volatility but it will also reduce the company's expected profit.
Buying reinsurance will give a more stable profit year on year
Reduced profits will worsen the solvency position but reduced claims volatility will strengthen it.
Above a certain profit load it will be better for the insurer to retain all the risk and below a certain profit load it will be better for the insurer to cede all the risk.
Between these two profit loads the insurer needs to fix the retention level in order to minimise the probability of ruin.
Therefore the insurer can set a retention level such that the probability of ruin is less than it would be without reinsurance thus achieving the desired effect.

Comments on Q1(i): *Generally well answered.*

- (ii) $\theta = 0.1, \gamma = 0.25, \lambda = 1500$

Insurer's profit margin is smallest, making less profit
Reinsurer's profit margin is biggest, taking more profit from the insurer
For a given claim severity distribution the higher the value of λ , the higher the expected number of claims and the variance.

Comments on Q1(ii): *Generally well answered, but some candidates believed incorrectly that the Poisson parameter does not impact the probability of ruin and some even incorrectly gave $\lambda = 1000$ as the answer.*

- 2** (i) *Requirements:*
Valid/appropriate
Complete/comprehensive
Adequately documented
Reflection of the risk profile of the classes of business being modelled
Parameter values should be accurate for the classes being modelled / fits the data
Outputs and their degree of uncertainty should be capable of independent verification
Outputs should be readily communicable/explainable/easy to understand
Should not be overly complex/take too long to run
Should not be too expensive to run
Flexible for the purpose

Comments on Q2(i): *Bookwork; most candidates scored well.*

- (ii) Severity: $E(X) = \alpha/\lambda = 12/0.02 = 600$
Frequency: $E(Y) = \lambda = 0.25$
Risk premium = $600 \times 0.25 = \underline{\pounds 150}$

Comments on Q2(ii): *Nearly all candidates calculated the risk premium correctly.*

- (iii) Severity: $\text{Var}(X) = \alpha/(\lambda^2) = 30,000$
 $\sigma(X) = 173.205$
so $E(X) = 600 \pm (0.05 \times 173.205) = (591.34, 608.66)$

Frequency: $\text{Var}(Y) = \lambda = 0.25$
 $\sigma(Y) = 0.5$
so $E(Y) = 0.25 \pm (0.02 \times 0.5) = (0.24, 0.26)$

Total Range (£141.92, £158.25)

Comments on Q2(iii): *This part involved calculating the ranges for the frequency and severity separately and then combining by multiplying. Some students incorrectly tried to add the frequency margin (a number) to the severity margin (as an amount) before applying to the risk premium. No marks were lost by students who calculated a correct one-sided upper range.*

- 3** (i) The excess is the sum, specified in the policy, that the insured must bear before any liability falls upon the insurer. They are widely used in personal lines insurance and may be compulsory (applying to all claims of the type specified) or voluntary (to secure lower premiums).

Comments on Q3(i): *Many candidates failed to define this term correctly.*

- (ii) *Reasons to use an excess*
To reduce the number of claims
To reduce the amount of each claim
To eliminate small claims, leading to reduced expenses
To encourage policyholders to reduce moral hazard, leading to lower claims
To reduce the customer premium (voluntary excess), leading to higher volumes and better retention rates
As an endorsement imposed by the insurer to limit their exposure to certain perils
To encourage better risk management by customers

Comments on Q3(ii): *Many candidates failed to pick up easy marks by generating too few examples.*

- (iii) Assume an average claim is at the mid-point of each range/claims are distributed evenly within the range

$$\begin{aligned}
 & (125 - 100) \times 250 + (175 - 100) \times 250 + (350 - 100) \times 500 \\
 & + (1,000 - 100) \times 3,000 + (2,000 - 100) \times 1,500 + (5,000 - 100) \times 500 \\
 & = 6,250 + 18,750 + 125,000 + 2,700,000 + 2,850,000 + 2,450,000 \\
 & = £8,150,000
 \end{aligned}$$

Comments on Q3(iii): *The calculations were straightforward but some students failed to deduct the excess from the average loss. Equal credit was given for candidates using average losses starting at 25.0 or 25.5.*

- (iv)

<i>New Loss Range</i>	<i>New Average Loss</i>	<i>Number</i>
0	0	3,500
1 to 100	50	1,750
101 to 200	150	750
201 to 300	250	250
301 to 400	350	250
401 to 1,000	700	500
1,001 to 3,000	2,000	3,000
3,001 to 5,000	4,000	1,500
5,001 to 15,000	10,000	500

$$\begin{aligned}
 & (150 - 100) \times 750 + (250 - 100) \times 250 + (350 - 100) \times 250 + (700 - 100) \times 500 \\
 & + (2,000 - 100) \times 3,000 + (4,000 - 100) \times 1,500 + (10,000 - 100) \times 500 \\
 & = 37,500 + 37,500 + 62,500 + 300,000 + 5,700,000 + 5,850,000 + 4,950,000 \\
 & = £16,937,500
 \end{aligned}$$

Comments on Q3(iv): *A simple question but some candidates were unable to apply the excess to obtain the correct result irrespective of having calculated part (iii) correctly.*

- (v) The number of claims hitting the excess is affected as well as the severity. This is a leverage/gearing effect caused by the excess being fixed in £ terms. If X is the loss and Y is the amount the insurer actually pays out then $(Y = X - 100)$ becomes $(Y = 2X - 100)$, which is not double

Comments on Q3(v): *An easy mark picked up by most candidates, even those who did not calculate parts (ii) and (iii) correctly*

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(i) **Benefits**

Marine Property

To indemnify the insured against the value of the loss or damage to the marine hull (subject to limits or excesses).

Cover can also be for marine cargo and specie and marine freight.

Marine Liability

To indemnify the insured against a financial loss (subject to limits or excesses). Associated legal expenses may also be covered.

Comments on Q4(i): *This bookwork question was answered well by many candidates but some failed to mention third party liability.*

(ii) **Insured Perils**

Marine Property

Perils of the sea/other navigable waters eg. storm, tsunami

Fire

Explosion

Jettison

Theft of cargo

Spoilage and contamination of cargo

Piracy

Capsizing

Stranding

Collision (iceberg or other)

Actions of the sea (e.g. waves damaging vessel)

Running aground

Specie (valuables)

Marine Liability

Damage to 3rd party property

Injury to 3rd parties (including death)

Injury to employees (including death)

Errors and omissions

Comments on Q4(ii): *Most candidates were only able to reproduce a short “standard” list and failed to go beyond that.*

(iii) **Exposure Measures**

Insured value of the hull/ship

Tonnage of hull/ship

Value of cargo

Limits of liability

Comments on Q4(iii): *Answered well by most candidates.*

(iv) ***Claim Characteristics***

Reporting delays: claims usually reported when the vessel reaches a major port.

(May be only a very small delay if claim takes place in the port.)

Settlement delays: could be long,

especially if there is a dispute over legal liability or the amount that should be paid.

Claim Amounts: variable. Relatively small amounts for hull damage to small vessels; very large amounts for complete loss of a large vessel and its cargo. Liability claims very variable; legal expenses element can dominate.

Claim Frequency: infrequent for hull but more frequent for cargo

Accumulations of risk are possible

e.g. geographical concentration (storm/tidal wave); spillage of hazardous material

Moral hazard – frequency increases in bad economic conditions

Salvage and subrogation are often employed

Currency issues

Comments on Q4(iv): *Strong candidates were able to make sensible comments covering a range of claim characteristics of the main marine insurances. Weaker candidates generated few points and made too many unqualified generalisations.*

(v) ***Risk Factors***

Hull

Level of cover / excesses and limits

Size/tonnage of vessel

Type of vessel

Condition of vessel

Age of vessel

Type of industry

Classification society

Engine type/manufacture

Country of build

Experience of captain and crew

Detention history

Areas sailed in (rough seas/war zones etc.) / locations visited

Tonnage of hull

Previous claims experience of ship

Previous claims experience of owner

Insured value / sum insured

Cargo

Level of cover

Value of cargo

Nature of cargo

How packaged

Where stored on ship (deck versus hold)

Trade terms
Trade routes taken
Standard property insurance risk factors apply when warehoused at port

Liability

Number of passengers and crew
Type of work undertaken by the insured (e.g. shipbuilder, marina operator)
Limits of liability

Comments on Q4(v): *Few candidates were able to produce a sufficiently wide range of factors to score well.*

- 5** (i) General Assumptions:
Policies attach evenly over any relevant period of time to both Contracts
Risk is uniform for each policy and each policy lasts 12 months
New policies do not change the risk profile on either Contract (i.e. mix constant)
so the average premium is not affected by new business or lapses and remains constant other than for a rate change
Endorsements and cancellations are ignored
Rate changes applied to policies written on the day of the change
Reinsurance is ignored
Commission levels constant from 2004 to 2007
In order to answer (iii) properly, best to keep A and B figures separate as far as possible

Calculate the monthly average premiums from 1st January 2004 to 31st December 2007 by adjusting for the rate changes.

	<i>Contract A</i>	<i>Contract B</i>
1 May 2005	£ 267.65	£ 1,591.20
1 November 2005	£ 273.00	£ 1,638.94
1 March 2006	£ 281.19	£ 1,720.88
1 October 2006	£ 275.57	£ 1,746.70
1 June 2007	£ 264.55	£ 1,772.90
1 September 2007	£ 251.32	£ 1,799.49

Method selected based on limited time available
... and expected to give similar answers to the more accurate “tranche” method
Assumption: annual average premium × policies written is an appropriate measure of written premium in an underwriting year
Assumption: can use overall proportions for earned/unearned premiums for each year

Take a simple average of the monthly average premiums in each calendar year to give annual average premiums for each of the underwriting years:

	<i>Contract A</i>	<i>Contract B</i>
2004	£ 265.00	£ 1,560.00
2005	£ 267.66	£ 1,588.76
2006	£ 278.42	£ 1,713.68
2007	£ 264.73	£ 1,770.84

From the definition of the “annual accounting basis”, it follows that the policies attaching to Contract B after 31st December 2004 should not be included in the 2004 underwriting year and hence should not be included in the UPR carried forward from 2004 to 2005

Adjust Contract B for policies attaching to the '04 binder, but that are written in the '05 underwriting year (i.e. 75% written in 2004; 25% written in 2005). Repeat for '05 to '07. No adjustment required for Contract A.

Adjusted Policy Numbers:

	<i>Contract A</i>	<i>Contract B</i>
2004	50,000	7,500
2005	52,000	10,825
2006	53,040	11,349
2007	57,824	11,861

Average Premium × Number of Policies Written = Written Premium

Written Premiums (000's):

	<i>Contract A</i>	<i>Contract B</i>	<i>Total</i>
2004	£ 13,250	£ 11,700	£ 24,950
2005	£ 13,918	£ 17,198	£ 31,117
2006	£ 14,768	£ 19,449	£ 34,216
2007	£ 15,308	£ 21,004	£ 36,312

Calculate the Acquisition Costs as 40% for A, 32.5% for B.

Calculate the UPR b/f for 2005 as 50% of the Contract A premium written in 2004 and 62.5% of the Contract B premium written in 2004. The 62.5% comes from assuming earning using the 24ths method (i.e. 9/24 earned in '04 and 15/24 earned in '05).

For all the subsequent underwriting years the earnings are assumed to be 50%/50%.

	<i>GWP</i>	<i>Acq Cost</i>	<i>NWP</i>	<i>UPR b/f</i>	<i>UPR c/f</i>	<i>NEP</i>
2004	13,250	5,300	7,950	0	3,975	3,975
2005	13,918	5,567	8,351	3,975	4,175	8,150
2006	14,768	5,907	8,861	4,175	4,430	8,606
2007	15,308	6,123	9,185	4,430	4,592	9,023
2004	11,700	3,803	7,898	0	4,936	2,962
2005	17,198	5,589	11,609	4,936	5,804	10,740
2006	19,449	6,321	13,128	5,804	6,564	12,368
2007	21,004	6,826	14,178	6,564	7,089	13,653
2004	24,950	9,103	15,848	0	8,911	6,937
2005	31,117	11,157	19,960	8,911	9,980	18,891
2006	34,216	12,228	21,988	9,980	10,994	20,974
2007	36,312	12,949	23,362	10,994	11,681	22,675

Comments on Q5(i): Most students correctly calculated the premiums following the rate changes for each contract, although a small number of students incorrectly applied each rate change to the 2004 premium, thereby failing to compound the changes. Most candidates attempted to do the calculations by looking at each tranche of rates separately. This was an accurate and valid approach but candidates using this approach were unlikely to be able to finish the calculations in the time available. Because of the limited time available, it was expected that students would split the calculation by year, taking an average premium for each year, rather than by tranche. The examiners gave equal credit to either method. Also, while it is recognised that candidates do not have a spreadsheet available to perform the calculations setting out the workings in the form of tables would have made the calculations easier to perform and to carry forward to later parts of the question. Not many candidates did this thereby making their workings more complex than necessary. While some candidates were able to make the correct calculations for Contract A, most failed to adjust correctly for Contract B. Some candidates did not appear to understand the concept of deferred acquisition costs.

(ii) *Additional Assumptions:*

- Ignore profit commission, tax and investment return on free assets
- Ignore reinsurance
- Incurred claims include IBNR/IBNER allowance
- No AURR required

Sum the calendar year incurred claim amounts for each contract = incurred claims

Calculate the paid claims in each calendar year (e.g. $35\% \times \text{GWP}$ for Contract A)

Outstanding claims reserve c/fwd = reserve b/fwd + incurred claims – paid claims with reserve b/fwd for 2004 = 0

Per policy expenses in '04 given. For each contract for each calendar year,
 $\# \text{ policies written} \times \text{per policy expenses} \times \text{per policy expense inflation} =$
 Expenses (per policy)

Allocated Overheads in '04 given. Apply 4% inflation p.a. to get '05 to '07.
 Split for A, B e.g. pro-rata to incurred claims

Calculate total expenses as Expenses (per policy) + Expenses (allocated overheads)

Underwriting Result = Earned Premium (net of DAC) – Claims Incurred – Total Expenses

Investment Return is taken as the average UPR b/fwd + Claim Reserve b/fwd + $\frac{1}{2}$ of cash flow times the annual investment return of 4.5% where cash flow is NWP less paid claims less expenses, or other reasonable formula

Insurance Result = Underwriting Result + Investment Return

	<i>Inc Cyr</i>	<i>Inc Pyr</i>	<i>Inc Clms</i>	<i>Paid Claims</i>	<i>Res b/f</i>	<i>Res c/f</i>
A						
2004	6,025	0	6,025	4,638	0	1,388
2005	6,625	750	7,375	4,871	1,388	3,891
2006	5,126	1,594	6,720	5,169	3,891	5,442
2007	6,100	1,875	7,975	5,358	5,442	8,060
B						
2004	5,000	0	5,000	3,627	0	1,373
2005	5,938	1,500	7,438	5,331	1,373	3,479
2006	5,475	2,700	8,175	6,029	3,479	5,625
2007	5,375	2,025	7,400	6,511	5,625	6,514
Total						
2004	11,025	0	11,025	8,265	0	2,761
2005	12,563	2,250	14,813	10,203	2,761	7,370
2006	10,601	4,294	14,895	11,198	7,370	11,067
2007	11,475	3,900	15,375	11,869	11,067	14,573

	<i>Per Pol Exps</i>	<i>Per Pol Exps Tot</i>	<i>O'heads</i>	<i>Total Expenses</i>
A				
2004	24.00	1,200	820	2,020
2005	24.96	1,298	777	2,075
2006	25.96	1,377	732	2,109
2007	27.00	1,561	875	2,436
B				
2004	78.00	585	680	1,265
2005	81.12	878	783	1,661
2006	84.36	957	890	1,848
2007	87.74	1,041	812	1,853
Total				
2004		1,785	1,500	3,285
2005		2,176	1,560	3,736
2006		2,334	1,622	3,957
2007		2,602	1,687	4,289

	<i>U'wtg Result</i>	<i>Inv income</i>	<i>Insurance Result</i>
A			
2004	-4,070	29	-4,041
2005	-1,299	273	-1,026
2006	-223	399	176
2007	-1,389	476	-913
B			
2004	-3,304	68	-3,236
2005	1,641	388	2,029
2006	2,345	536	2,881
2007	4,400	679	5,079
Total			
2004	-7,373	197	-7,176
2005	342	661	1,003
2006	2,123	935	3,057
2007	3,011	1,155	4,166

Comments on Q5(ii): Even if students had not managed to complete part (i), it was possible to pick up quite a lot of marks in part (ii), and some students did this. Even without premium figures, claims and expense figures could be calculated and candidates also gained marks for formulae and workings even where the final figures were incorrect. Very few students calculated claims reserve figures or were able to calculate profit.

(iii) *Comments:*
Number of policies, average premiums and total premium

Contract A average premiums rose in 2005 and 2006, but fell back to 2004 levels in 2007 following a series of rate reductions.

Growth in Contract A policy numbers was most prolific as rates decreased. Average premium decreases are likely to have been part of a growth strategy (because if the market had been decreasing rates to the same extent, volumes would not have grown at that rate).

Contract B average premiums rose from 2005 to 2007 and growth in policy numbers was also strong over the same period.

So the market may have been putting rates up at a faster pace than the increases on Contract B or Contract B rates started too low.

In 2004 the GWP of Contract A was slightly higher than that of Contract B. By 2007 the GWP of Contract B was dominating the mix.

As the acquisition costs on Contract A policies (40%) are higher than on Contract B policies (32.5%), Contract B's contribution to the total Earned Premium (net of DAC) is greater than its contribution to the GWP.

Claims

The total claims ratio (Incurred Claims/Earned Premium (net of DAC)) has been improving slightly year on year from 2005 to 2007.

Contract A claims ratio has deteriorated over that period, due probably to falling premium rates and rising claims costs.

Contract B claims ratio consistently improves from 2005 to 2007 due, in part, to consistent rate increases over the period.

At 2007 the Contract B claims ratio may suggest that further upside potential is limited.

So the total claims ratio improvement is being driven by the claims ratio improvement in Contract B and its relative size in (net earned) premium terms compared to Contract A.

Expenses

The total expense ratio (Total Expenses/Earned Premium (net of DAC)) improved from 2005 to 2007.

Contract B has a much better expense ratio than Contract A.

The improvement in Contract B's expense ratio from 2005 to 2007 has been cancelled out largely by the deterioration in Contract A's expense ratio.

Contract B total per policy expenses are lower than Contract A total per policy expenses so Contract B has a better per policy expense ratio.

Overheads are falling as a proportion of premium as the annual premium growth is well ahead of inflation in overheads.

Performance

The total combined ratio was less than 100% from 2005 to 2007, so the business unit is making an underwriting profit.

The profit margin (Insurance Result/Earned Premium (net of DAC)) has improved from 2005 to 2007. The contribution to the insurance profit from

investment income decreased from 2005 to 2007 as the underwriting results improved.

Contract B produced most of the underwriting profit in 2006 and 2007 and significantly outperformed Contract A, so Contract B is cross-subsidising Contract A.

This cross-subsidy may be deliberate on the part of the business unit e.g. the unit writes both with the same third party administrator, so losing one contract means losing the other.

If the trend in Contract A's underwriting result it will keep upward pressure on the total underwriting result and will increasingly draw on subsidy from Contract B.

Contract A requires rate increases/performance review/renegotiation of commission terms if it is to be brought into profitability.

Past profitability of Contract B suggests that rates could be dropped to increase volumes while still remaining profitable.

However, may become increasingly difficult to grow Contract B volumes while Contract A is underperforming as Contract B is cross-subsidising Contract A.

Both contracts produce similar investment income ratios (Investment Income/NEP(net of DAC)).

The investment income ratio improved from 2005 to 2007 as there was more cash available for investment in each successive year.

If Contract A had not been written, then the total profit would have been higher over the three year period. (Contract A only made a small positive contribution to the insurance profit in 2006. In 2005 and 2007 it was a significant drain.)

Comments on Q5(iii): *Very few candidates recognised that marks could be gained for sensible comments made without having completed part (i) or part (ii). Those who did, tended to score best on this question.*

- 6**
- (i) 2 key insured perils:
Accidental Damage
Theft (from insured location/vehicle/within territorial limits)

Comments on Q6(i): *Most candidates recognised theft as being the key peril. Some candidates did not read the question and listed more than two perils.*

- (ii) *Rating factor characteristics:*
Practical (objectively measurable)
Relate to the intensity of the risk/define the risk
Do not correlate too closely with the other rating factors

Comments on Q6(ii): *Surprisingly, the characteristic most frequently ignored by candidates was that a rating factor should reflect the intensity of the risk. Without that, the factor could represent anything.*

- (iii) *Rating factors:*
Value of bicycle
Postcode / Age of policyholder / Use (e.g. business/pleasure) / frequency of use

Comments on Q6(iii): *Again, some candidates did not read the question and offered more than two rating factors.*

- (iv) *Non-standard add-on covers:*
Public liability – death or bodily injury to 3rd party
Public liability – damage to property belonging to 3rd party
Worldwide cover (rather than limited to home country)
Cover while bicycle is away from the home (not always included when a bike is covered under a Household policy)
Damage while in transit e.g. on a bike rack on a car, on an aeroplane
Hire of a bicycle while being repaired/replaced
Personal accident
Roadside recovery
 E.g. to repair a puncture/after falling off and damaging bike
Cover while racing
Replacement of helmet if you fall off, even if damage is not obvious
New for Old cover on bikes up to, say, 3 years old
Cover for spare parts & accessories e.g. spare wheels not attached to the bike (if not covered by Household Contents policy)
Non-standard bicycles
 E.g. tandem/unicycle/electric bike
Extension to other members of family / other named drivers
Cover while child in seat on back
Extended warranty
Legal protection & assistance following an accident
Malicious damage/vandalism

Comments on Q6(iv): *Poorly answered, with only the strongest candidates offering a range of sensible add-on covers that reflected the nature and cost of the standard insurance policy. Some candidates suggested add-on covers that would not be insurable or would have had disproportionately large premiums when compared to those typical of the standard insurance policy.*

- (v) *Difficulties with data:*
The data supplied by different companies may not be comparable:
 different geographical section of market
 different socio-economic section of market
 differences in cover (exclusions, excesses, policy conditions)
 differences in underwriting practice
 differences in claim settlement practice
 differences in nature of data stored by different companies
 different coding used for risk factors/rating factors
Industry-wide data may not even exist for this class
Data may not be detailed enough for pricing
Data may be out-of-date (takes time to collect, collate & distribute)

Data quality may be poor (depends on quality of data of all contributors)
Not all companies contribute so may be unrepresentative

Comments on Q6(v): *Although this was a fairly standard question, many candidates failed to cover the range of points needed.*

- (vi) *Data: Policy*
Postcode
Make/Model of bike
Age of bike/year of make
Value of bike
Excess chosen (if there is an option)
Age of policyholder
Cover level (UK/Worldwide; leisure/racing; etc.) including use of bike
Estimated annual mileage
Add-ons chosen
Policy number
Dates – inception/renewal/mid-term change
Premium amount
Payment frequency (annual/monthly)
Payment method (DD/credit card)
Unique link between policy and claim, for matching
Unique link between this policy and other products e.g. customer number

Claims
Incident date, reported date, settlement date
Claim number
Cause of loss
Paid date for all claims payments
Claim amount paid, by peril
Claim amount outstanding, by peril
Claims handling expenses
Claim status

Comments on Q6(vi): *Many candidates were able to suggest a wide range of data items that could reasonably feature in the management information system.*

7

(i) Aggregate Deductible

Introduction of the aggregate deductible means that now the sum of the claims to the layer must exceed the deductible before the cedant can make a recovery so for a given amount of exposure, expect the aggregate deductible to reduce the cedant's expected recovery and increase the cedant's retention

The extent of the impact of the aggregate deductible depends on:
the size of the aggregate deductible (for a given exposure in vehicle years)
the expected number and severity of losses to the layer (for a given exposure in vehicle years)
e.g. large aggregate deductible relative to expected number/size of losses means lower recoveries for the cedant (and vice versa for a small aggregate deductible)

Stability Clause

Before the stability clause applied, the expected amount of total losses to the layer would have increased annually (all else being equal) because of:
the effect of TPBI inflation on severity of individual losses to the layer (i.e. the conditional expected value of a loss to the layer increases with inflation)
and the gearing effect of TPBI inflation increasing the frequency of losses to the layer (i.e. probability of a loss to the layer increases with inflation)
A stability clause means the attachment point and layer limit are adjusted in line with some specified index (e.g. fixed x% p.a. or a healthcare cost index) with the intention of maintaining real values to the layer
so the layer widens with each application of the index
e.g. £1m xs £1m indexed by 2% is £1.02m xs £1.02m

Adding the stability clause has the following expected impact

The frequency of losses to the layer may drop over time e.g. a claim that starts in the layer may settle below the layer

For a given loss, its actual attachment point depends on the settlement date (i.e. the attachment point will increase in line with the stability clause index until the loss settles)

If the deductible is small relative to the expected claims cost without the deductible, the expected claims cost to the layer is simply the cost without deductible less the deductible amount.

Whereas if the deductible is relatively large then a straight deduction is not correct and claims to the layer can only be estimated using a distribution and probabilities.

The actual impact of the stability clause depends on the cedant's actual claims experience and on the inflation in TPBI claims relative to the index applied to the layer i.e. inflation could be different to the assumed indexation.

Comments on Q7(i): Most candidates were able to define a stability clause and explain the effect this would have. Fewer were able to explain the aggregate deductible.

(ii) *Reinsurer*

- + stability clause ensures alignment of interest by encouraging faster claims settlement (as net retention increases with each year due to the indexation of the attachment point and limit),
- + stability clause gives some protection against expected future inflation in the claims to the layer
- + aggregate deductible reduces exposure to the cedant and allows the reinsurer to use capital elsewhere
- + benefits if the sum of claims to the layer doesn't breach the aggregate deductible or claims settle below the indexed attachment point

- actual claims inflation may outstrip the indexation thereby eroding the benefit of the stability clause over time (likely in practice)
- potential increase in expenses for setting up and managing more complex contracts
- lower premium income with introduction of aggregate deductible
- more volatility in claims cost to the layer relative to the premium charged

Cedant

- + the aggregate deductible reduces reinsurance spend (especially beneficial if reinsurance rates are hard)
- + can use the aggregate deductible to manage risk appetite
- + the aggregate deductible means higher expected profit as ceding less to the reinsurer generally means ceding less profit
- + cedant can manage total exposure to the reinsurer (reinsurer security impacts capital requirement)
- + cedant may be able to negotiate a lower premium because of the stability clause

- aggregate deductible delays recoveries (cashflow implications)
- greater loss retention, so alternative source(s) of capital required (alternatives may be more costly).
- greater volatility in the retained losses
- retains some inflation risk i.e. if the TPBI inflation is lower than the indexation, then more likely that a claim estimated to settle in the layer settles below the layer

Comments on Q7(ii): *Any advantages and disadvantages given in part (i) were given credit under part (ii). In general, candidates failed to think of enough valid advantages and disadvantages to score highly in part (ii).*

END OF EXAMINERS' REPORT