

INSTITUTE AND FACULTY OF ACTUARIES

EXAMINERS' REPORT

September 2013 examinations

Subject ST7 – General Insurance: Reserving and Capital Modelling Specialist Technical

Introduction

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

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

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

The report is written based on the legislative and regulatory context 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.

D C Bowie
Chairman of the Board of Examiners

January 2014

General comments on Subject ST7

Candidates who are well prepared generally appear to perform reasonably on ST7, with the more challenging questions tending to occur on SA3. Candidates should consider the following advice however (if they are not already):

- Lists are hugely valuable for breadth of point generation but candidates should always exercise judgement when applying them.
- Calculation questions will come up on a regular basis with ST7, as candidates can clearly observe from examination of historical papers. Candidates should always be prepared for such staples as balance sheet preparation, triangle manipulations & projections and reinsurance layer calculations (along with being able to carry out any necessary adjustments including inflation, exposure and time period issues).
- Capital questions should be expected on every paper and represent a sufficient proportion of the course content that candidates should not expect to be able to pass on their reserving knowledge alone. Those who do not encounter capital work in their professional lives should be particularly careful to ensure that they take time to familiarise themselves with this element of the course.
- Candidates should aim to be able to give near exact glossary definitions as incoherent or vague descriptions will be marked harshly. If candidates struggle to remember definitions verbatim they should take the time to properly analyse the glossary definition to ensure they have fully absorbed all the nuances of the definition.
- It is important to always read the question properly.

Comments on the September 2013 paper

See comments under individual questions.

- 1** Main difference is either the entity that will make a claim under the policy or whether coverage is for illegal versus inappropriate acts.

Fidelity guarantee is insurance for a company against dishonest action of employees
..such as fraud/theft /embezzlement that causes loss to the company.

While directors' and officers' liability provides coverage of directors and officers for claims from third parties
...for losses caused by wrongful acts performed in their capacity as directors or officers.

Candidates should have got full marks for this bookwork question. A good number of candidates did so.

- 2** The prime objective for asset choice is to maximise investment return subject to meeting all contractual obligations and recognising the uncertainties involved.
The implication for asset choice is that the assets should match those of the liabilities in relation to term, amount, nature and currency.
Value for money/expected return: the price is dependent on whether attractive to investors
...e.g. to pension schemes which may have pushed the price up to an unattractive level

Product liability covers faulty design, faulty manufacture, faulty packaging and incorrect instructions.

... for property damage and bodily injury

... usually on a claims incurred basis (rather than relating to year of sales).

There are some long reporting and settlement delays.

.. e.g. where time is taken to attribute physical conditions to the correct cause and where claims relate to rogue drugs causing settlements to continue for some years *or any other reasonable example.*

The suggested asset is long-term

However, the mean term of the asset is likely to be considerably longer than the mean term of the liabilities.

The suggested asset purchase is appropriate by reference to the real nature of some of the liabilities caused by the delays.

Bodily injury claims inflation might well be higher than CPI

The liabilities are volatile so difficult to match to assets in terms of cash flow

Expected return on this asset is likely to be lower than that which can be earned on equities

If there are sufficient free reserves the asset may be suitable for part of these as less volatile than equities.

And depends on the risk appetite of the company

Does this asset fit in with the portfolio currently held?

What other classes of business are written and what percentage is this of the total business (materiality)?

What currency are claims expected to be paid in?

Marketability in respect of accumulation of claims

Regulatory needs/ capital aspects

The credit rating is likely to be good as it is government debt
... but this does need to be considered particularly as the question doesn't say what government this refers to

Regional mix of business as local RPI may differ from territories where business is written or where products are sold or manufactured
...even if only locally written, cases may be dragged to other jurisdictions

There may be diversification benefits as could be negative correlation between this and other assets

Tax implications

On balance, argue whether or not worth buying

Generally well answered although a large number of candidates thought that the 1% nominal coupon was the yield without realising that the actual yield depends on the price. Most just gave advantages and disadvantages without actually specifying whether the stock should be purchased as requested in the question.

- 3** (i) Dividend yields
 Future interest rates/yield curves
 Levels of major share indices
 Future inflation rates
 ..could be split into RPI/CPI/wage inflation
 Returns on property
 Bond yields
 Exchange rates
 Credit spreads
 Information on derivative contracts e.g. option price volatilities
 Projected future default rates
 Projected unemployment rates by country
 GDP

Most candidates did not list sufficient variables to gain full marks.

- (ii) Fall in equity/property values due to recession..
..could also lead to increase in fraudulent claims in some classes.
..and higher losses from creditor/MIG policies.

Higher inflation rates will lead to changes in real bond yields..
..and higher claim costs in certain classes.
..together with increase in expenses/running costs for the business.

Large catastrophe event leading to high level of claims
..and potential problems recovering from reinsurers.
..and reduction in value of assets (*or other example*)

Significant changes in tax system in a particular territory
..could increase cost of settling claims and decrease post tax returns

The company may have investments in companies whose collapse could lead to insurance as well as investment losses
..for example if creditor policies are offered to employees of a particular large company.

Mis-valuation of assets could also mean mis-valuation of the reserves
...perhaps due to systematic control and governance problems in parts of the company.

Other reasonable suggestions.

A large number of candidates did not read the question and rather than suggesting interdependencies between assets and liabilities answered how to match assets and liabilities or explained what dependencies they may have on external factors such as interest rates.

- (iii) A central control system for all assumptions used in the model should be maintained centrally
..as accuracy and consistency of assumptions is vital
..across different territories
.. within the company
.. and over time

Model change policy should be put in place
..with tight governance process for approval of change in assumptions
.. and acceptance control

Stakeholders in key assumptions should be part of the parameterisation and sign-off process where possible
.. subject to appropriate sign-off authorities

All assumptions should ideally be validated
.. using historic data or benchmarks
..and documented fully including rationale for selection.
Data used should be up to date and appropriate

All assumptions should be reviewed on a regular basis (e.g. annually)
..with independent/external validation being used as appropriate.

Professional guidance and regulations should be adhered to
Model input and output should be monitored

Process for communicating uncertainty to stakeholders.

A surprising number of poor or non-attempts given that some application of general principles and common sense would give many of the points around consistency, documentation and verification of assumptions. Many did not mention any governance processes or sign-off requirements.

- 4** (i) Intermediary networks likely to be used widely to reach customers buying houses.
..examples could be banks/building societies/conveyancers/homebuilders/mortgage brokers.

Likely distributed as an affinity product with branding of bank/building society
Possible to use independent brokers but may be difficult to reach the small target market

Will not be financially viable for the company to set up a network of tied brokers..
..but could sell direct through call centres if staff sufficiently skilled.

Internet/ door to door/ off the page unlikely to be appropriate
.. given possible high level of premium and length of commitment from policyholder.

At point of sale an up-to-date valuation will be available but not necessarily later.

Many candidates gave all possible distribution channels for a general insurance product without demonstrating that they understood which would be appropriate for the specific product. Very few pointed out that at point of sale there would be an up-to-date valuation but not necessarily later.

- (ii) Claims will be highly correlated with economic downturn
..so claims experience has potential to be very high if severe/prolonged economic crash.
..and may be recessionary links to other risk factors

Doesn't appear to be cap on potential downside...
..so potential losses up to value of each property.

Single premium difficult to calculate given long term of contract
..especially uncertain as to amount of investment income on single premium.

New product so likely to be little historic data available on performance of product.

Potential for adverse selection against the insurer as insureds could take advantage of market developments to trade up
.. and could be moral hazard as insureds allow property to deteriorate if not fully allowed for in valuation

Valuations to determine the extent of loss are likely to be subject to challenge
.. and may be biased/cyclical

To make product economic likely to require detailed terms & conditions
.. as otherwise would have high risk of insured taking advantage e.g. by increasing mortgage amount or term or having mortgage holiday
.. this increasing the risk of mis-selling the product.
..particularly if it is being sold as an add on with other financial services e.g. mortgage
..therefore risk of regulatory intervention if unhappy with product.

Premium likely to be very large as proportion of house sale
..so could be unpopular/unaffordable to customer meaning low take up
..then risk of company not being able to pay marketing/overhead costs.

Long term and volatile nature of product may require significant capital to support

Some generic points although not specific, as requested, may be considered to be more relevant for such a product: e.g. reinsurance may not be available or expensive for such a product, new business strain, accumulations in particular areas etc.

Many candidates gave generic risks rather than the specific risks requested in the question.

5 The first is model uncertainty.

This arises because actuarial models are often a simplification of a very complex (and unknown) underlying system.

By using a simplified model to project the true underlying system, we are introducing an unknown bias into the model.

Any reasonable example e.g. we may use standard probability distributions to model claims size

whereas in reality the claims-size distribution will be unique and will depend on the characteristics of the underlying book of business.

The second is parameter uncertainty.

Parameter uncertainty refers to the uncertainty in determining the parameters for an actuarial model.

This usually results from the statistical variability present in the historical data used to estimate the parameters.

Any reasonable example e.g. an absence of large losses in historical data can lead to an error in the estimation of the “average” claim development pattern.
Past data will never comprise all possible outcomes.

The third is process uncertainty.

If a process is assumed to be inherently stochastic, the future outcome will be uncertain because of the randomness of the process and the fact of course that many of these events have yet to occur.

This uncertainty is present even if model selection is perfect and the parameters are known with certainty.

Any reasonable example e.g. a significant change in legislation with retrospective effect may mean that even if the model exactly reflects the underlying process as it existed in the past and it has been perfectly parameterised the actuarial estimates do not reflect actual future events.

For a bookwork question this was poorly answered. Many candidates identified the three main risks but were then generally unable to give much in the way of additional detail. Despite specifically asking for examples many candidates failed to give these or gave inappropriate ones. Also the definition of model risk was often wrong.

- 6** It should be noted that the selection of reserves for the accounts of an insurance company are wholly the responsibility of the company's board.

The changes make the selection of reserves more difficult. There are two extremes that are possible: to ignore the changes entirely and to assume that they will be fully effective

The actuary should ensure that in his report to the board the choice is set out clearly so that the board may make an informed decision

..to select one of the two extremes
..or somewhere in between them
..and may give a range of possible outcomes
..and should stress that the reforms have not yet taken place
..and that will not affect claims already paid

It is not appropriate simply to be cautious: if it is appropriate to select a cautious estimate then it is the board's prerogative to do so, not the actuary's, and the board should be able to make such a choice in the informed knowledge that that is what they are doing.

There could be additional claims handling expenses which should be incorporated

The report should indicate how much confidence the actuary has in the changes being successful,

..and the uncertainty should be clearly documented

..and the board will also be able to take into account reports about the reforms from other functions in the company.

The actuary may indicate his preferred selection,

but this is one situation in which it may be appropriate for him not to do so.

Projecting ultimate claims on the basis that the reforms have no effect will present no particular difficulties: the work should be done as if no changes had been made

..and will need to be done first, before considering any possible adjustments based on the new procedures.

The normal difficulties of projecting ultimate claims will remain, but these would have arisen in any case.

In projecting ultimate claims on the basis that the reforms are fully effective the actuary will need to consider whatever evidence is available for their effect.

Work has clearly been carried out on the reforms, and this should have included an evaluation of their effect on overall claims costs; it is possible that the actuary was involved in this work.

If so, he may give it full credibility.

If, on the other hand, the quantitative work was done by, for example, claims managers, then the actuary may examine it critically for methodological errors or excessive optimism.

The actuary should also consult with other stakeholders

..and should challenge any assumptions that do not seem credible

It is unlikely that the unpaid claims will get the full benefit of any reforms.

Unpaid claims consist disproportionately of those that take a long time to pay.

These are claims that are not easy to settle, possibly requiring litigation, and may be ones that were being more rigorously treated in the first place.

It may also be harder to start to deal rigorously with claims that had been opened and initially dealt with in a more sloppy fashion than it is to deal with new claims rigorously.

For example, evidence gathering may be difficult if not done early in the process.

If the likely effect of the reforms has not been quantitatively assessed then the actuary has little to go on to assess their likely effect. Caution is appropriate in these circumstances.

It would be wrong to ignore entirely the possible effects of these reforms: they are really happening and are evidently a significant development.

Some analysis of the projected savings, for example looking at the projected saving by type of claim and length of time to settlement may be helpful, but ultimately this exercise must depend heavily on the actuary's judgement, which must be clearly explained to the appropriate decision makers.

In effect the projection of results on the basis of no change and full success is a form of scenario testing.

However, the actuary should not use this as a reason for testing wholly implausible scenarios, for example that the reforms have their full hoped-for level; or success on a book of claims that is already partly processed.

Should consider any regulatory requirements/ tax guidance.

Must comply with professional standards

Speeding up payments will not necessarily reduce amounts but will affect discounting.

Should ensure monitoring of the changes when they take place

*Although the question does not ask **how** the actuary would adjust methodology to allow for the new procedures marks are given for any reasonable generic methodology points.*

This was very poorly answered. Almost all candidates answered "how to adjust methodology" rather than "what issues the actuary should consider" and "extent to which he should allow for them" as asked for by the question. Even then there was some confusion with many candidates seemingly answering the question given in April 2013 rather than addressing the situation actually asked. Very few grasped the fact that the board set the reserves.

- 7** (i) Ability to write business in many countries (without seeking separate regulatory approval).

Lloyd's chain of security including central fund can improve financial standing

..which may be attractive to policyholders increasing business..

..as will the Lloyd's of London brand and reputation.

There are stricter capital requirements

Lloyd's has a high credit rating

Access to large subscription market...

..writing a large range of classes of business

..unusual risks

..very large risks

Following on line-slips allows companies to build up experience and data over time

Increased administrative requirements to comply with Lloyd's regulation..
e.g. require to have an annual SAO which may be costly

A levy is payable for operating in Lloyd's

Lloyd's can impose restrictions on types of business written
..and approves/amends individual syndicate's business plans.

Capital setting process is often perceived as unfair
Three year accounting basis/ profit not released until end of third year.

A bookwork question that was generally well answered although few scored the full marks which were available.

- (ii) The amounts of capital required are significant
..which indicates that the syndicate is probably large...
..or writes business that is particularly risky

In particular reserving risk is very high..
..possibly due to writing a significant amount of long tailed business
..and/or reflecting that the syndicate has been in operation for some time

Underwriting risk is also material
...so the syndicate intends to continue to write a significant amount of business
..perhaps increasing proportion written in capital intensive areas such as
catastrophe reinsurance
..though given size of reserving risk could have been larger in the past and
shrunk

The aggregate insurance risk of 550 is not possible if other figures are correct
(and assuming that insurance risk comprises only reserving and underwriting
risk)
..even if risks were fully dependent would give maximum capital requirement
of 525.
..indicating that the correlations in the model are incorrect or some other error.
Or that there are other contributing components not shown in the table (e.g.
catastrophe risk)

Market risk is relatively low...
..as would typically be the case for a Lloyd's syndicate.
..indicating investments are probably low risk such as gilts rather than equities

Counterparty default risk is unusually high
..suggesting that significant reinsurance
..from lower grade reinsurers may be utilised
..and/or significant funds remain with third parties (brokers/loss funds at MGAs)
..and/or investment counterparties may be weak.
There is some overlap between market risk and counterparty risk so relativities may or may not be odd.

Operational risk appears to be low relative to other risks
..possibly due to inadequacies in modelling for this risk

As expected, liquidity risk is fairly low as secure investments...
...and future premium income from new business.

The total syndicate capital requirement seems quite low compared to its constituent parts
..again suggesting issues with correlation assumptions or application
..or alternatively that the total figure is discounted whilst components are not.

Calculation of fully diversified syndicate capital requirement (£433m) (square root of sum of squares of each assumed independent risk component)
...compared to assuming complete dependence (£685m)
Note: other assumptions could be used and hence different answers obtained and should be given marks if reasonable explanation (e.g. using the £550 aggregate risk figure given if assumption that includes other components).

No group risk indicates that syndicate is stand-alone (unless omitted, given other problems with the figures).

It would be useful to know on what basis the figures have been calculated
..and the mix of business written

Many candidates scored quite well. Surprisingly few however commented on the absolute size of the capital figure indicating a large syndicate, questioned on what basis the figures had been prepared, or, having commented on reserving risk, made any comments on underwriting risk. Also, many candidates failed to spot the obvious errors/inconsistencies in the table despite the question asking to consider “reasonableness”, with some coming up with long winded explanations as to why the figures made sense.

- (iii) Amend business plan of what is to be written over the next year
..either by reducing volumes written
..or moving to less capital intensive or uncorrelated lines
May be difficult to achieve much relief from this as reserves are dominant
Reduction may be problematic in any case as fixed costs may rely on a level of current year activity

Alternatively could increase volumes of business written to give additional profits assuming reserving risk is the dominant factor

Seek additional sources of capital from elsewhere

...such as from the names

...taking on a third party capital provider or otherwise raising finance

Purchase additional reinsurance from highly rated reinsurers

..in particularly entering into a quota share arrangement can provide capital relief

..or require reinsurers to post collateral

Attempt to reduce reserving risk by undertaking commutations/LPT/novation on back-year liabilities

..though this option is likely to be costly and time consuming

Engage third party actuary to carry out a review of the capital model.

..to provide independent validation that the estimated capital is reasonable.

Hold discussions with the regulator to identify any areas of difference arising from particular risks..

..and provide additional information if there are syndicate specific issues that are not being considered.

Improve market and liquidity risk e.g. by increasing matching

Should combine different mitigating actions

..but should also consider materiality (it is not stated how much more capital is required)

Most candidates got the more generic points such as reducing business written, more reinsurance etc. Some candidates talked about one or two possibilities in great detail (e.g. changing the reinsurance). Answers such as using exotic reinsurance or investment products would not be appropriate as these would increase risk. Equally the regulator is unlikely to find a response involving the wholesale revaluation of reserves or assets such as allowing for discounting acceptable. Not many identified challenging Lloyd's review or getting an independent review.

8 (i) Mix of business by profession

The ultimate loss ratios (ULR's) may differ between, for example, solicitors, architects, brokers, actuaries, accountants, IFAs.

This may be due to different levels of competition in these different sectors.

Due to different levels of risk appetite

e.g. architects' and solicitors' professional indemnity experience have been poor in recent years (*or other relevant example*)

Some insurers may concentrate on only one profession

Others may exclude certain professions e.g. no big-4 accountancy firms

Some professions may incept at certain times of the year e.g. solicitors
business incepting in September/October
which is particularly relevant to consider for a company that has only been
writing since 1 July.

Size (turnover or number of partners) of assureds

Large practices may have very different claims experience to smaller
practices.

Higher fees and larger potential losses.

Different risk management standards.

Different clients and therefore different services provided (some more risky).

Territory in which business written

London market business may be different in nature to regional e.g. due to size
of risks.

London market business will include world-wide risks.

US professional indemnity business in particular may perform differently to
local

Size and type of lines written

Some insurers may write mainly primary layers whereas others write excess
layers.

Different terms and conditions
..e.g. limits and deductibles may differ.

Claims made versus claims occurring policies: business written on a claims
made basis may be different in nature to that written on a claim occurring
basis.

Would expect a slower claims development pattern on a claims occurring
policy than on a claims made policy.

Although professional indemnity is generally written on a claims made basis

Accident or underwriting year basis

Premiums net or gross of commission

..and net or gross of reinsurance

If net of reinsurance need to consider differences between reinsurance
programmes

Different underwriting philosophies

Some insurers trying to build market share may be happier to write at higher loss ratio.

Differing quality of underwriting done by competitors.

Different reserving philosophy: Some insurers may reserve strongly, others less so.

May appear in returns as by underwriting year or accident year.

Underwriting year claims development expected to be slower than accident year development.

Size of account impacts credibility for benchmarking purposes.

Smaller accounts may be more volatile in terms of claims experience.

Large claims may distort the benchmarks

Reputation, age and experience of the company

Distribution channels

Different claims management processes

However, there is a need to be pragmatic as making too many restrictions will mean that there are very few or no companies left to benchmark against

Many candidates managed to identify quite a range of issues that should be taken into account. Not many commented on the original insureds' risk profile or gave examples of different professions. Hardly anyone commented on the credibility of the data given the number of potential restrictions.

- (ii) Professional indemnity is reasonably long-tailed so place less reliance on ULR's on immature years.
.. although in the figures given the 1st year estimates appear to be reasonably reliably forecast
.. and as they are the most recent forecasts are not to be taken lightly

At the end of the first development year, the incurred claims seems only to be about 40% of ultimate claims.

So suggest not relying on 2011 booked ultimate loss ratio.

Historically, it can be seen that the ULR for a particular accident year can drift over time.

It may be that companies book a pessimistic ULR initially to avoid poor run-off.

2008 may be too old to be representative
.. terms and conditions are likely to have changed alongside the premium rate changes
and there may have been a shift in the mix of business with new capacity entering the market.

Establish from underwriter whether there are any large losses/events that might have distorted any of the figures in the market information.

Although these may be heavily skewed based on changing environmental/ legislative/ economic factors depending on the business written

May use 2009 and/or 2010 accident years as starting points (*or other suggestion, if reasonable*).

Roll forward for premium rate changes
Definitely need to adjust for rate changes as they haven't been flat.
And adjust for inflation, if appropriate

Need to understand from underwriter more about what the premium rate change information represents
... before or after allowing for claims inflation?
... and what would a typical claims inflation assumption be?
... allowance for changes in terms and conditions e.g. reduced coverage?

Should consider whether the premium rate changes are appropriate
May estimate the earned premium rate change between year x and $x + 1$ as the average of the underwriting year rate changes between $x - 1$ and $x + 1$.

Although would discuss with underwriter how business incepts and earns throughout the year.
..and obtain underwriters' views on the loss ratios

Should also enquire as to when information updated with 2012 data may become available

Most candidates suggested rolling forward for rate changes but few considered other issues such as which years to use with some not even mentioning inflation. Few commented on the actual figures in the table, e.g. on the first year estimates being quite good. A few candidates suggested using a Bornhuetter-Ferguson method for obtaining the benchmark which shows a complete lack of understanding.

- (iii) *The assumption from how the question is written should be that the returns are based on account year data and therefore the rate changes need to be adjusted to an underwriting year basis before rolling forward to 2012 terms. Also, if 2008 is included then an assumption needs to be made for the earned rate change for that year:*

<i>Accident Year</i>	<i>..</i>	<i>2008</i>	<i>2009</i>	<i>2010</i>	<i>2011</i>
<i>Starting ULR</i>	(1)	122%	87%	65%	59%
<i>Earned rate change to next year</i>	(2)	50%	37.5%	17.5%	2.50%
<i>Rate change factor to 2012</i>	(3)	248%	166%	120%	103%
<i>Inflation to 2012</i>	(4)	136%	126%	117%	108%
<i>ULR in 2012 terms</i>	$= (1) \times (4) / (3)$	67%	66%	63%	62%

Sensible claims inflation assumption e.g. 5% to 10%, or zero if it is specifically stated that the rate changes allow for inflation and that the level of inflation used is reasonable

Select the average of the ULRs => 64% based on years 2009 to 2011 or 65% based on all 4 years (or other sensible selection).

Despite the assumption from how the question is written candidates may have assumed that the returns are based on underwriting year data and therefore the rate changes do not need to be adjusted, but do need to state this and use half-year less for the inflation factors to get to account year 2012:

<i>Underwriting Year</i>		<i>2008</i>	<i>2009</i>	<i>2010</i>	<i>2011</i>
<i>Starting ULR</i>	(1)	122%	87%	65%	59%
<i>Earned rate change to next year</i>	(2)	50%	25%	10%	-5%
<i>Rate change factor to 2012</i>	(3)	196%	131%	105%	95%
<i>Inflation to 2012</i>	(4)	131%	121%	112%	104%
<i>ULR in 2012 terms</i>	$= (1) \times (4) / (3)$	82%	81%	70%	65%

Specific assumption made that figures given are on an underwriting year basis
Sensible claims inflation assumption e.g. 5% to 10%, or zero if it is specifically stated that the rate changes allow for inflation and that the level of inflation used is reasonable

Select the average of the ULRs => 72% based on years 2009 to 2011 or 74% based on all 4 years (or other sensible selection).

This was very poorly answered. Despite often stating in the answer to (ii) that allowance for inflation should be made very few actually did so. The assumption could have been made that the rate changes allowed for inflation but very few made such an assumption some even assuming 0% inflation. Often candidates tried to project the incurred claims data to ultimate although ultimates have already been given. Some projected the triangle of ultimates which might have been appropriate if there was a trend but there was no evidence of this. Despite the

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question asking for an accident year figure while rate changes are shown on an underwriting year basis hardly anyone made any allowance for this.

- (iv) *Divide PLR and ILR by ULR to get sample percentage development:*

PLR/ULR

<i>Ac Yr\Dyr</i>	<i>1st</i>	<i>2nd</i>	<i>3rd</i>	<i>4th</i>
2008		16.7%	32.0%	68.0%
2009	6.7%	25.9%	47.1%	
2010	10.1%	35.4%		
2011	5.1%			

ILR/ULR

<i>Ac Yr\Dyr</i>	<i>1st</i>	<i>2nd</i>	<i>3rd</i>	<i>4th</i>
2008		74.2%	86.4%	98.4%
2009	38.2%	76.5%	86.2%	
2010	46.4%	64.6%		
2011	39.0%			

Note: an alternative approach to the above calculations is to divide the PLR or ILR by the latest estimate of the ULR in each case, rather than the ULR estimated at previous year-ends. This approach assumes that the earned premium in the denominator is consistent over time (i.e. no late bookings or mis-statements of premium). This alternative approach should get credit if that assumption is stated.

PLR/Latest ULR

<i>Ac Yr\Dyr</i>	<i>1st</i>	<i>2nd</i>	<i>3rd</i>	<i>4th</i>
2008		16.4%	32.8%	68.0%
2009	6.9%	25.3%	47.1%	
2010	10.8%	35.4%		
2011	5.1%			

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ILR/Latest ULR

<i>Ac Yr\Dyr</i>	<i>1st</i>	<i>2nd</i>	<i>3rd</i>	<i>4th</i>
2008		73.0%	88.5%	98.4%
2009	39.1%	74.7%	86.2%	
2010	49.2%	64.6%		
2011	39.0%			

Identification of correct development year against each data point.

Average development %'s across accident years are as follows:

<i>..</i>	<i>ULR basis</i>	<i>..</i>	<i>Latest ULR basis</i>	<i>..</i>	<i>..</i>
<i>Dev Yr</i>	<i>Paid</i>	<i>Incurred</i>	<i>Paid</i>	<i>Incurred</i>	<i>..</i>
1	7.3%	41.2%	7.6%	42.4%	
2	26.0%	71.8%	25.7%	70.8%	
3	39.6%	86.3%	40.0%	87.4%	
4	68.0%	98.4%	68.0%	98.4%	

Dev year 4 position is based on only one sample point (relating to 2011) so this is likely to be less reliable.

For incurred claims, there seems to be a reasonable amount of consistency between sample points at the same development period

For paid claims, there appears to be some evidence of claims speeding up ..for second dev year, % developed goes up from 17% on 2008 accident year to 26% on 2009 and 35% on 2010.

..for third dev year, % developed goes up from 32% on 2008 accident year to 47% on 2009.

So using averages won't reflect any such trends.

So may prefer to use incurred patterns rather than paid patterns (especially as incurred is more mature).

Any other reasonable observations.

Again very poorly answered. Many candidates failed to realise that the paid/incurred loss ratios should be divided by the ULRs. Many candidates did not attempt the question or made a complete mess of the calculations often giving answers which were obviously wrong without comment e.g. cumulative development percentages at 4th year of 100% for both paid and incurred claims. Comments on reliability often tended to make little reference to the figures.

END OF EXAMINERS' REPORT