

EXAMINATION

April 2007

Subject ST3 — General Insurance Specialist Technical

EXAMINERS' REPORT

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.

M A Stocker
Chairman of the Board of Examiners

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Comments

Individual comments are shown after each question.

1

(i)

- Biggest danger is charging insufficient premium — this is a new distribution channel
 - exacerbated by lack of data since only have a small existing book
 - which might not cover the relevant professions
- Lack of expertise in the professions CEO may be interested in
- May be difficult to attract staff (e.g. underwriters) with enough experience of PI
- Inappropriate rating structure that could lead to anti-selection
- Could annoy brokers of existing PI book — could lose this business
- Risk of loss of broker value (e.g. collating detailed underwriting and risk information from clients, administering policies and claims)
- Significant set up costs for direct operation — might not be recouped if insufficient volume of business
 - This could be more likely as this is a “new” channel, and other professions may prefer to place the cover through a broker
 - The set up costs/ongoing expenses may be much higher than anticipated especially if we do not have experience in selling direct
- There is a danger that a competitor reacts e.g. by a similar campaign leading to lower volumes than anticipated
- Exposure to large losses
- Greater exposure to accumulation event as write more business and more professions, but may be more than offset by diversification benefit
- Reinsurance risk — insufficient or unavailable coverage
- Regulation risk — e.g. channel authorisation
- May sell bigger volume than expected leading to too much risk/increased capital requirement
- Reduced persistency (e.g. lower retention)
- Operational risk of setting the whole arrangement up

(ii)

- Problem of lack of data might be mitigated by using reinsurer data if using reinsurance
- Industry data might also be useful if available
- Reinsurers could also provide expert advice in this field on rating and underwriting
- Alternatively recruit more experienced staff
- Reinsurers provide assistance in mitigating the risk of large single losses and accumulations (e.g. through per risk xl cover and cat cover)
- Use financial reinsurance or raise more capital to support balance sheet
- Difficult to mitigate the risk of annoying brokers. It may help to “sound them out” beforehand or allow them to sell the new product as well
- Difficult to predict competitor action but company should monitor competitors pricing levels
- Danger of low volume mitigated by market survey
- Full costing with experts on similar projects would help to assist in correctly estimating expenses (or similar sensible comments on controlling expenses)

- Regular monitoring should ensure that volume controlled and addressed by regular rating action
- Check with regulators that this class and marketing method are allowable
- Research reinsurance market to ensure sufficient coverage available
- Check that relevant IT systems, human resource and facilities are capable of coping with new operation
- Carrying out pilots with “friendly” brokers will help identify issues early

Comments on question 1: Part (i) was generally well answered by most candidates. For part (ii) not all candidates ensured that all of the points raised in part (i) were subsequently addressed. Candidates who identified the financial, operational and reputation risks scored particularly well in this question.

2 (i)

- Try to maximise investment return subject to meeting liabilities with chosen level of certainty
- Match assets and liabilities by
 - term
 - amount
 - nature
 - currency
- Motor property damage claims are mainly short tailed, so need liquid assets
 - need to hold cash on deposit, very short dated assets such as short dated government securities to match liability outgo
- Motor third party claims are longer tailed and costs are influenced by inflation
 - need to hold some longer dated real assets (index linked securities if available or low risk equities)
- Consider regulatory requirements :
 - restrictions on assets that can be held
 - prescription to hold assets
 - custodianship of assets
 - mismatching allowed
- Since company is small, need to have extra consideration of the level of uncertainty in reserves, so more secure, liquid assets required
- A small company might consider collective investment vehicles (e.g. unit trusts, investment company shares)
- Investment likely to be in assets of small unit size (e.g. no direct property investment)
- Level of investment expenses of each asset type
- Tax efficiency of each asset type
- Availability of certain asset types
- Benchmarking against competition
- Availability of additional capital (e.g. parent company, shareholders)
- Diversification of assets held (within and between asset types)

- Size of the free reserves (in excess of solvency requirements)
 - As the company is small, the company is less likely to be able to accept the risk of investing in higher risk/reward investments (e.g. property)
- Expected growth plans and resultant needs to invest in the business
- Shareholders and management's attitude to risk

(ii)

- Since company is large, assuming larger free assets, potential scope for more aggressive investment strategy.
- Employers' liability claims are generally longer tailed and costs are influenced by inflation
 - Greater need to hold longer dated assets providing real returns
 - since better match by term for liabilities
- Equities and properties are an appropriate match
- Index-linked bonds (if available) for security and inflation hedge
- Potential investment in specialist areas such as large unit size, ventures, brokers, derivatives
- Likely to handle investments in-house through specialist team of managers giving greater control over investment choice

Comments on question 2: Most candidates scored well on this bookwork question. A few candidates suggested investments in part (i) that were unlikely for a small company (e.g. direct property).

3

(i)

- Once the £15m aggregate is exhausted and/or as there is no aggregate limit on public liability, there is the potential for a single bad year
- Unlimited coverage for motor — potential for large single loss
- Large limit for public liability — potential for large single loss
- Do we have the required reinsurance coverage to protect the insurer against these ?
- Need to clarify if the excesses/limits cover legal and other expenses

(ii)

- Model the motor and public liability accounts separately
 - Group claims by property damage and bodily injury per cover
 - Need to model the frequency and severity separately in order to apply deductible
 - Use client's data as start point (since large dataset)
 - Pick a base period
 - Use from the ground up data
 - Adjust for IBNR and IBNER
 - Adjust the claims for inflation
 - Adjust for change in exposure
 - Adjust for trends in data
 - Adjust for changes in underwriting and claims handling procedures

- Adjust for any changes in terms and conditions over period considered
- Compare outcome with any internal portfolio/external benchmark data
 - especially for large loss assumptions
 - consider credibility weighting to portfolio/benchmark
- Consider any relationship between claims received under motor and public liability covers to determine any correlation in experience
 - Unlikely to be strong so probably model as independent.
- Could use deterministic modelling approach to determine parameter estimates for frequency and severity for each cover
- Determine the mean values for both parameters
- Alternatively could model the outcome of the individual accounts using stochastic modelling approach
- Carry out several thousand simulations and apply the product “rules” to the outcome
- The average outcome to the insurer in the simulations will give the expected loss cost to the insurer
- This would also provide the range of possible claims experience scenarios which could assist in determining suitable reinsurance arrangements

Comments on question 3: *This question was poorly answered by most candidates. Some candidates were of the mistaken opinion that unlimited liability for motor is abnormal. Many candidates suggested use of Generalised Linear Modelling techniques involving the use of rating factors when this was clearly inappropriate for a policy for which all losses are large losses. Furthermore, many candidates decided to cut and spread large losses when the purpose of the cover was to protect the insured against large losses. This requires an analysis of the claims size distribution to determine the impact of the deductible and aggregate deductible on the expected claim frequency and severity. Very few candidates explored benchmarking claims experience against internal/external claims data nor the use of deterministic and stochastic methods in pricing this policy, thus missing out on a significant number of the available marks.*

4 (i)

Assumptions

Assume claims inflation in 2008 = claims inflation in 2007
Development factors are on the same basis as claims stats

Projected Claims Costs (before claim inflation allowance)

<i>Year</i>	<i>Damage Costs</i>	<i>Third Party Personal Injury Costs</i>
2003	$44 + 30 = 74$	58
2004	$55 + 32 = 87$	72
2005	$40 + 37 = 77$	68
2006	$74 + 62 = 136$	64
2007	$57 + 67 = 124$	67

Amounts in £000

Claim inflation adjustments to 2008

<i>Year</i>	<i>Damage Costs</i>	<i>Third Party Personal Injury Costs</i>
2003	$1.04^5 = 1.217$	$1.07^2 \times 1.09^3 = 1.483$
2004	$1.04^4 = 1.170$	$1.07 \times 1.09^3 = 1.386$
2005	$1.04^3 = 1.125$	$1.09^3 = 1.295$
2006	$1.04^2 = 1.082$	$1.09^2 = 1.188$
2007	1.04	1.09

Projected Claims Costs (after claim inflation allowance)

<i>Year</i>	<i>Damage Costs</i>	<i>Third Party Personal Injury Costs</i>
2003	90	86
2004	102	99
2005	86	88
2006	147	76
2007	129	73
Total	554	422

Amounts in £000

Burning Cost per vehicle = $(554 + 422) \times 1000 / (80 + 88 + 90 + 92 + 98)$
= £2,178

$$\begin{aligned}\text{Gross Premium to charge client} &= (\text{number of vehicles in 2007} \times \text{burning cost} \\ &\text{per vehicle} \times \text{claims costs} + \text{policy expenses} + \text{vehicle expenses}) / \\ &(\text{1} - \text{commission rate} - \text{profit and contingency loadings}) \\ &= (100 \times 2178 \times 1.07 + 100 + 10 \times 100) / 1 - 0.15 - 0.05 \\ &= \text{£}292,683\end{aligned}$$

Also identifying and allowing for any legitimate trends in the data, e.g. improvement in PI peril

Alternative acceptable approaches scored equivalent marks

(ii) Yearly burning cost observations

$$\begin{aligned}2003: & 175,872/80 = 2,198 \\ 2004: & 201,106/88 = 2,285 \\ 2005: & 174,499/90 = 1,939 \\ 2006: & 222,903/92 = 2,423 \\ 2007: & 201,429/98 = 2,055\end{aligned}$$

$$\begin{aligned}\mu &= (2198 + 2285 + 1939 + 2423 + 2055)/5 = 2,180 \\ \sigma &= \text{Square root of } \{(5 \times (2198^2 + 2285^2 + \dots) - (2198 + 2285 + \dots)^2)/(5 \times 4)\} \\ &= 190\end{aligned}$$

$$\begin{aligned}\text{Therefore } Z &= \min(1, 1 - 190/2180) \\ &= \min(1, 1 - 0.087) \\ &= 0.913\end{aligned}$$

$$\begin{aligned}\text{Therefore revised gross premium} &= Z \times 292,683 + (1 - Z) \times (100 \times 3750) \\ &= \text{£}298,932\end{aligned}$$

Note alternative approach: one could strip out the claims cost from the average premium and then blend claims costs and reconstruct gross premium from that

(iii)

- The 5 year historical claims experience may be heavier or lighter than is expected in 2008
- Potential large losses in historical data distorting the calculations
- Competitors pricing levels
- Insurer may be willing to take a reduced profit or slight loss on this business as the policyholder has other insurance contracts with the company that are highly profitable.
- Using the insurer's own heavy goods vehicles experience may be inappropriate, for example the account may have a different business mix to that of the client (e.g. age of drivers, location of vehicles).
- Cover provided in 2008 differs from that in previous years (e.g. increased own damage excess)
- Different policy wordings/restrictions expected to reduce claims costs/numbers

- Expected future external events (e.g. changes in legislation) that may impact claims costs, expenses, commission or profit allowances
- Per policy expense allowance in main account may be disproportionately higher than that required under this fleet contract
- Influence of broker/customer (e.g. volume of other business offered by broker/customer)
- Regulators may restrict the price that could be charged
- Other assumptions not used in the calculation (e.g. investment return, reinsurance)
- Management decision/growth plans/attitude to risk
- Position in the market cycle

Comments on question 4: In part (i), the examiners' solutions provide one answer although alternative solutions were given equivalent marks (e.g. taking an average of each year's burning cost per vehicle). Some candidates applied the profit and contingency loading to the risk premium and not the office premium as stated in the question. Parts (i) and (ii) were fairly numerical questions and these parts were generally well answered by most candidates. However, some confusion arose over the time period to use for the inflation figures. Some candidates also failed to realise that, as the incurred claims development data were as at 10, 22, ... months there was no need for further adjustments to allow for the data provided being as at 31 October 2007. For parts (ii) and (iii) the better candidates identified the external factors such as market, distribution and regulatory influences on the price. For part (iii) most candidates failed to generate enough ideas.

5 (i) Brokers

- A company which acts as an intermediary between the seller and the buyer of the insurance product without being tied to either party

Banks, Building Societies and other financial institutions

- A company whose main activities include providing financing to small businesses and can therefore cross-sell insurance on the back of loan arrangements

Trade Associations

- A union whose main activity is to provide support and advice to companies of a similar trade who can provide insurance products tailor-made to their requirements

Internet

- The insurance company can develop a web-based sales point with the customer entering all the relevant rating information through the internet to obtain a quote for insurance

Telesales

- A call centre arrangement managed by the insurance company to provide in-calls and out-calls to potential clients
- In-calls can be through advertising in press or telephone directories
- Out-calls can be through leads generated from commercial tradesmen databases

Direct mailshot

- The insurance company can directly target potential clients through the posting of literature to small business tradesmen

Employed staff paid by salary or commission

- Staff of the insurance company visit the potential clients face to face to discuss their insurance requirements based on their circumstances.

Affinity Groups (e.g. Trade Retailers, Training Groups)

- A company whose main activities are non-insurance related (e.g. a building supplies wholesaler) but whose organisation has a significant Commercial customer database to target sales.

(ii)

- Companies of all sizes (small and large) may use Commercial brokers as they can offer advice on their specific insurance needs.
- Larger international companies with credible data attract individual underwriting and brokers facilitate this, whereas a standard rating structure approach is used for smaller risks
- Companies of all sizes could be a part of a trade association
- The remaining distribution methods are more likely to be used mainly by small businesses due to:
 - the relative speed and ease of obtaining low cost insurance
 - the far greater propensity for clients to use the distributor for other non-insurance activities
 - the commodity nature of small business insurance products makes them more appropriate for direct route
 - cost considerations : lower unit delivery cost of internet when compared to brokers is appropriate for low average premiums

(iii) Public Liability

- The insured is indemnified against legal liability for the death or bodily injury to a third party

- Or for property damage belonging to a third party
- Other than those liabilities covered by other liability insurance

Employers Liability

- The insured is indemnified against legal liability to compensate an employee or temporary employee for the death, disease or bodily injury suffered owing to the negligence of the employer during the course of employment.

Contract Works

- Indemnifies insured against loss of or damage to contract works property being worked on and materials

Plant insurance (Hired or Own Plant)

- Indemnifies insured against loss or damage to plant whether it is hired or owned by the insured

Employees Tools All Risks

- Indemnifies insured against loss or damage to tools used in the course of trade

Personal Accident/Sickness

- Indemnifies all people specified under the cover for loss of earnings in an event of an injury or accident, whether temporarily or permanently out of work.

Professional Indemnity

- Indemnifies insured against legal liability resulting from negligence in the provision of a service (e.g. inaccuracies in architectural building design)

Vehicle insurance (vans, pickups, goods vehicles, trucks, lorries)

- Property Damage — indemnifies insured against loss or damage to their own vehicles
- Third Party Liability — indemnifies insured against compensation payable to third parties for damage to their vehicle or property or for personal injury

Acceptable alternative valid covers :

Commercial Fire/Business Interruption/Offices

Fidelity Guarantee/Theft by Employees

Pecuniary Loss/Credit Guarantee/Third Party Failure

Comments on question 5: Part (i) was well answered by the majority of candidates. A few candidates listed distribution channels but failed to describe them as the question asked. Candidates failed to generate many points for part (ii) and thus missed many points on the marking schedule. The better candidates identified the differences between the commodity nature of selling insurance to small businesses and the more bespoke underwriting requirements of selling insurance to large international businesses. In part (iii), candidates who scored well identified the specific property and casualty insurance risks of small construction and engineering businesses.

- 6** (i) *Assumptions*
 All yearly business
 No reinsurance
 Risks written uniformly across year
 Risk is uniform across policy year

	<i>Company</i>		
	X	Y	Z
Assets			
Total investments	125	3500	1000
Current Assets	5	80	30
Deferred Acquisition Costs	8	150	25
Total Assets	138	3730	1055
Liabilities			
O/S claims reserves	30	850	700
Additional URR	15	100	0
UPR	25	1000	125
Current Liabilities	11	100	40
Free Reserves	57	1680	190
Total Liabilities	138	3730	1055

- (ii) *Assumptions*

- assume GWP = GEP (i.e. business written in 2005 = business written in 2006)
- assume AURR as at 31/12/2006 = AURR as at 31/12/2005
- assume outstanding claims reserves include IBNR

Loss Ratio = claims incurred/GEP

Company X = $(35 + 30 - 20)/50 = 90\%$

$$\text{Company Y} = (700 + 850 - 800)/2000 = 37.5\%$$

$$\text{Company Z} = (150 + 700 - 750)/250 = 40\%$$

$$\text{Expense Ratio} = \text{Acquisition Expense Ratio} + \text{Non Acquisition Expenses/GWP}$$

$$\text{Company X} = 30\% + 5/50 = 40\%$$

$$\text{Company Y} = 15\% + 250/2000 = 27.5\%$$

$$\text{Company Z} = 20\% + 30/250 = 32\%$$

$$\text{Underwriting Ratio} = \text{Loss Ratio} + \text{Expense Ratio}$$

$$\text{Company X} = 90\% + 40\% = 130\%$$

$$\text{Company Y} = 37.5\% + 27.5\% = 65\%$$

$$\text{Company Z} = 40\% + 32\% = 72\%$$

For solvency ratio:

$$\text{Solvency Ratio} = \text{Free Reserves/GWP}$$

$$\text{Company X} = 57/50 = 114\%$$

$$\text{Company Y} = 1680/2000 = 84\%$$

$$\text{Company Z} = 190/250 = 76\%$$

For return on capital employed:

$$\text{Return on Capital employed} = (\text{Earned Premium} - \text{Claims Incurred} - \text{Expenses} + \text{Investment Income}) / \text{Free Reserves}$$

$$\text{Company X} = (50 - (35 + 30 - 20) - 5 - 15 + 3)/57 = -21\%$$

$$\text{Company Y} = (2000 - (700 + 850 - 800) - 250 - 300 + 100)/1680 = 48\%$$

$$\text{Company Z} = (250 - (150 + 700 - 750) - 30 - 50 + 16)/190 = 45\%$$

(iii) **Comments**

- Company X may have suffered from adverse claims experience due to its higher loss ratio compared to the other companies.
- Each company may be writing different classes or mix of business, each at a different point in their respective market cycle
- Company X expense ratio is higher due to higher acquisition expense ratio.
- The company is smaller than Y and Z and it may be spending money to expand rapidly.
- Company X solvency ratio is higher than the other companies.
- This may be the result of a recent capital injection to expand the business.
- Company Z has the lowest solvency ratio, suggesting that the company is less financed than the other companies.
- Or it may have more stronger valuation basis for its assets and liabilities

- Company Z return on capital employed is the highest, supported by a larger relative investment return compared to the other companies
- Company Y and Z both have high returns on capital employed, supported by a good underwriting results
- Relevant comment comparing profitability and solvency

(iv)

- Investment Return = Investment Income/(Current Assets + Investments)
- This provides a comparison of the investment performance of the companies.
- Gross Claims Paid/Gross Outstanding Reserves
- This provides a comparison of the relative speed at which reserves are reduced by claims payments
- Gross Outstanding Reserves/Gross Written Premium
- This provides a comparison of the relative strength of the outstanding reserves
- Additional Unexpired Risk Reserve cfwd / UPR cfwd
- This provides a comparison of the relative profitability of the unexpired risk
- Current Assets / Current Liabilities
- This provides a comparison of the ability of each company to meet short term liabilities without the need to realise investments

Acceptable alternative valid ratios:

- Loss Ratio
- Expense Ratio
- Profit Margin
- Total Assets/Total Liabilities

Comments on question 6: *The examiners were disappointed by the standard of answers to this question. In part (i) a number of candidates made assumptions that were inconsistent with the data provided in the question (e.g. assuming “all policies were written on 1 January each year with no UPR at year end” even though an AURR was being carried forward at year end). Some candidates thought that share capital was an asset and failed to understand that this formed part of the free reserves of each company. In part (ii), a number of candidates did not know the definition of underwriting ratio with some incorrectly assuming it was derived from the underwriting profit. In part (iii), the better candidates commented on possible reasons for the level of the ratios in part (ii) and compared profitability and solvency levels for each company separately. Most candidates merely commented on whether the ratios were high/low for each company without providing any explanation as to what may be driving the results. In part (iv), a number of candidates defined ratios that could not have been derived from the data as specified in the question (e.g. % reinsured).*

END OF EXAMINERS' REPORT