Subject F203 — *General Insurance*

Specialist Applications
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MEMORANDUM

Overall

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, the marking schedules contains open ended marks for other sensible comments in some sections where they are deemed necessary. There are significantly more than 100 marks available

Performance on this paper was mixed. In line with previous F203 exams, a considerable number of candidates undermined themselves by providing generic or off-topic answers. Specific observations are provided by question throughout this report.

Candidates should note that F203 is the key paper at which we test candidates' broader thinking. This is generally the final paper before qualifying as a professional, and we consider a capacity for broader thinking to be one of the best indicators of a candidate's suitability to act as a professional actuary. As such we aim to design exam papers so that it is difficult to pass without displaying some capacity for independent and broad thinking, as well as to heavily reward instances where these skills are displayed. When reviewing past papers, candidates should assume that the marks available for generic points are substantially less than those awarded for the more challenging points that would be the mark of high quality professional insight in a practising actuary. Marks available for list items from bookwork are lower still.

In conclusion, we would offer candidates two key pieces of advice – read the question properly and take the time to think about what is going on. Time spent making sure that you are answering the question that is asked is therefore more valuable than a panicked rush to put down as many points as possible, regardless of whether they are relevant.

QUESTION 1

This question examined candidates' understanding of the functioning of a mutual insurance company as well as additional sources of profit in the case where a BucksBack bonus returns all the underwriting profit earned by the mutual. This means that the introduction of the BucksBack bonus completely invalidates the typical sources of profit for the insurer. The question also examined the risks associated with the BucksBack bonus at a very granular level. The setting of these reserves under SAM as well as ceasing providing these benefits to members of the mutual was also examined.

(i) Examiners' notes:

This question required candidates to identify sources of profit for the mutual insurer apart from underwriting profits. Candidates required fairly deep insight into lapse and investment profits in the context of a mutual offering a BucksBack bonus. Candidates were also required to identify the risks related to these sources of profit. The question was generally poorly and generically answered.

Investment returns

- Key driver of profit will be income earned over the period that the premiums are held
- Depending on premiums, very large reserves for investment could be accumulated after a few years
- There is lots of investment uncertainty
    - claim experience different from expectation - frequency and severity
    - claims pattern over duration of policy different from expectation
    - premium higher / lower than expected
    - investment returns different from expectation
- Long-term nature of bonus may support a more aggressive investment mandate
- but liquidity is also required to pay claims
- ALM - may match expected bonus with long-term assets to lock-in returns
- but mismatch risk due to uncertainty of bonus liability
- Longer duration matched assets may be illiquid and may cause risks/costs in realising to meet maturing bonuses
- being a mutual, policyholders share in unrealized gains which can fall after declaration of profits

Lapse profit

- Lapse is a potential source of profit, because BucksBack keeps the accumulated balance at time of lapse
- Reasons for lapses
    - Sold property
    - No longer working for the SOE
    - Premiums unaffordable

    - Move to another insurer
    - Pass away
    - Neglect to pay premium
- However, a large BucksBack bonus balance will increase retention rates
- Even policyholders without a property may remain insured to receive the bonus
    - the risk increases as the bonus payment date gets closer
- Lapse will be highest where claims exceed premiums therefore no BucksBack bonus expected
    - no accumulated lapse profit for these policyholders
    - but scope for future premiums to accrue so still want to retain these
- High lapse risk after 6 years when bonus is paid
- There is scope for aggressive rate increases to increase lapses
    - there may significant reputational risk
    - Regulatory / TCF Risk

Other

- Reinsurance recoveries made since the BucksBack is based on claims made
- Non-reinsurance recoveries e.g. liability from third parties when damaging the property
    - May be grievance / dispute in cases where policyholder is not at fault but lose bonus
- Margin on repair costs
- Referral fees from service providers
- Impact of company expenses and tax

(ii) *Examiners' notes:*

Section ii required candidates to discuss the risks associated with providing a BucksBack bonus by considering policyholder behaviour, reviewing premiums, expense base, SAM and TCF in the context of a mutual insurer. This question was poorly answered in general with most candidates providing generic risks rather than risks specific to the BucksBack bonus and a mutual insurer. Candidates often seemed to miss the point that because a bonus was payable in the case that claims were not made, typical sources of profit and loss for a normal insurer were not appropriate for the scenario in question, and the BucksBack bonus had to be specifically considered.

Policyholder behaviour

- Policyholders may be less likely to claim:
    - influenced by excesses and claims handling charges
    - and impact on subsequent rate increases
    - difficulty of claiming
- Policyholders may manage their risk better by ensuring the property is well maintained to reduce risk of geyser claims or fire claims
    - even more so when nearing the 6 year bonus payment
    - especially small claims as they will effectively pay for it themselves with the reduction in bonus
    - However, the benefit of lower claims cost effectively go to policyholder through a higher bonus - selecting against the insurer

- The mutual may save some admin cost but this will be marginal
- Policyholders may be unhappy since they are partially self-insuring
- Some policyholders may delay submitting claims to after the bonus payment
- Once total claims exceeded premiums, the propensity to claim would be the same as standard products
  - or even higher if policyholder feel they have paid for a benefit they would not get
- Mixed impact - selection of low risk policyholders
  - most likely expect a good bonus
  - higher LSM clients as they can afford deferral of benefits
  - difficult benefit to understand may attract more educated clients
  - Or mis-sold to people with low understanding

Reviewing of premiums

- This product will work much better with high volume and low value claims which can be expected to be covered by the premium reserve
- Infrequent large losses would create high claims costs but make no material impact to the premiums returned
- In practice, homeowners insurance is likely to have a mixture of low value (e.g. geyser) and high value (fire) claims
- Higher premiums would increase the proportion of claim costs likely to fall below the return of premiums
  - but there may be reputational / competitive issues with this
- Reinsurance can help mitigate the risk of large claims & spike losses
- but the BucksBack bonus design means that the reinsurance premium cannot be funded from an underwriting margin
- Re-opened claims / IBNR / IBNER uncertainty at end of 6 years may exacerbate impacts
  - depending on T&Cs and scope to agree final liabilities before BucksBack bonus settlement

Expense base

- Additional expense uncertainty with this product
- Expenses may be lower than for typical home owners insurance
  - lower marketing costs as innovative product sells itself and presented to SOE employees
  - BucksBack bonus encourage high retention rates and thus better coverage of acquisition costs
  - lower claims handling due to disincentive to claim
- Conversely, expenses can be higher
  - monitoring of accrued benefits
  - active investment fund management and trading costs
  - system requirements to support the product feature
  - higher education of policyholders and sales staff and design costs
  - more disputes as policyholders stand to lose bonus
- Return of premium is what client paid and will include any applicable commission

- unless sold directly to employees of the mutual

Solvency Capital required under SAM regime

- May be high capital requirements as a substantial 6 year liability is being built up for the return of premium cashflows
  - although volatility of that cashflow will be low relative to other cashflows unless standard volatility factors are used.
  - There will be a large lapse charge depending on expected lapse rate
- Substantial asset balances will be built up which may attract a high capital load
  - Especially if assets are invested with longer-dated, higher return investments
- Capital is likely to be hugely expensive if investment returns are generally high due to the opportunity cost of capital
- ALM will reduce exposure to changes in expected returns / yield
- May have regulatory capital ad hoc loading as risk is not well understood

Market conduct and Treating Customers Fairly

- Customers may regard it as unfair if they lose their BucksBack benefit following a claim that was not their fault
- This may result in higher lapses, lower sales and damage to SOE's reputation, which might ultimately reduce profits
- If experience is worse than expected, insurers generally have a number of levers to improve profitability
- The design of this product means that these levers may not be effective, increasing the risk of losses if experience is different to expected
- For example, if premiums were increased in response to higher claim costs, most of the benefit of higher premium would go to customers (through the bonus benefit)
- The regulator may apply additional scrutiny to this product
  - given the potential to manipulate rates
  - non-standard nature
  - anti-competitive nature
  - T&C / wording risks
  - Barrier to exit
- Unclear how much they can deny / increase rates / cancel

(iii) *Examiners' notes:*

Many candidates did not identify the complexity introduced due to the definition of contract boundary. Generally, candidates provided the bookwork answer of appropriate reserves under SAM legislation but failed to relate it back to the question. Overall the question was adequately answered.

- The contract boundary definition is complex for this product
  - Contractually, the mutual can give 30 days' notice to adjust premium or terms and conditions of cover

    - However, according to the benefits provided, it may be argued that the boundary of the contract is 6 years based on policyholder expectation
    - The legal boundary is currently the boundary that will apply, i.e. 30 days
- The most conservative estimate of the reserve would be to take the accrued bonus to date and assume the whole amount could become payable
    - However, SAM requires reserves to be at best estimate with a separate risk margin for the cost of capital to back the uncertainty within the best estimate
- Thus, an adjustment should be made for expected lapses
- As well as expected claims impact on the accrued benefit
- And discounting given the importance of investment returns on the cost of this bonus
- Allowance should also be made for expected cashflows within the next 30 days
    - The underlying assumptions used for the accrued liability may apply here
    - Complexity for expected bonuses within the next 30 days - not issue yet as still 4 years away
- Also need to raise a debtor for premiums still to be collected in the next 30 days to align with the increased liability held for the cashflows within the next 30 days.

(iv) *Examiners' notes:*

The options available to the mutual to stop back the BucksBack benefit was generally well answered by most candidates.

- The options depend on what the product terms and conditions say
- And if the mutual is permitted to change the terms and conditions
- There may also be regulatory or legal restrictions on the mutual's options
- There are reputational risks for the mutual and the SOE by association to the product
- The mutual can just stop offering the bonus
    - this may have a major impact on the attractiveness of the product offering
    - but will at least stop writing new loss-making business
- They could return the current BucksBack balance to all policyholders and stop the benefit
    - this would avoid any further accumulation of losses
    - some policyholders will be pleased to receive an immediate pay-out
    - however, it comes with significant reputational risk
- Since it is a mutual, a more cooperative solution could be obtained by reducing the BucksBack bonus in expectation of future losses
    - the BucksBack bonus can be proportionally reduced to reflect the overall profitability of the mutual
- Can also reinsure the adverse development to at least provide certainty of future cost
    - However, policyholders expect a gross pay-out so the RI cost will need to be carried by the mutual

QUESTION 2

This question examined a range of actuarial topics related to the potential merger of two similarly sized insurance companies writing the same classes of business. The question examined changes to reserves at a gross and net of reinsurance level following a court judgement, the merits of discounting and ability to discount under different solvency and accounting regimes as well as the reasons for differences in capital held under Interim Measures, SAM and Economic. The factors to consider in determining the final shareholding between the equity holders involved in the transaction were also discussed. The final section of the question was a simple calculation to test whether the high-level financial objectives of the merged entity could be met.

i. *Examiners' notes:*

The first part examined the necessary investigations required to determine the change in the company's gross and net reserves for the PI line of business if a recent court judgement in the industry were to be allowed for. Candidates generally answered this question satisfactorily.

- You will need to categorise the claims so that you can create a split between attritional and large claims
- Identify the historical settlements which could be used as a basis of analysis.
- For the attritional claims likely that traditional actuarial methods could be used to estimate provisions (e.g. Chain Ladder and BF methods)
- For large claims, the individual claim records will be used. These claims would need to be projected and then an analysis would need to be performed to see which claims fall into the excess of loss/facultative covers
- Overlay the current reinsurance structure - to both the attritional and large claims. Large claims would need to be projected and then an analysis would need to be performed to see which claims fall into the excess of loss/facultative covers
- Would need to understand the relationship between the RI contracts, i.e. FAC first, Proportional second and Non-Proportional third
- Facultative contracts would be applied to the individual contracts giving rise to the claims
- Consider changes in reinsurance structure between different underwriting years
- Consider any clauses and terms and conditions in RI contracts which would reduce recoveries in future
- Consider changes to the current IBNR held. Does IBNR methodology require adjustment to allow for possible latent and other claims following the court judgement.
- Look at the factors recorded on the claims and how the new judgement would have impacted on the settlement.
- Investigate the effects how a court judgement can typically affect Professional Indemnity claims which give rise to higher potential settlement amounts
- Court judgements can also affect the number of claims that end up in court will significantly affect the gross: net ratio
- Identify characteristics on claims which lead to an increase in settlement amounts - e.g. Type of practice, geography etc.

- Investigate the impact on the different reinsurance types: Proportional, Non-Proportional and Facultative reinsurance cover
- The effect of the court award is likely to result in more claims entering the reinsurance program, investigate the gearing effect on the reinsurers portfolio
- Reinsurers may have analyzed market data that could be used as a benchmark, could collaborate with them to perform further investigations based on this data
- Discussion with the HAC to get guidance as she may have had experience on this topic

ii. *Examiners' notes:*

The question asked for a discussion of the merits of discounting PI reserves as well as the differences applied between IFRS IV, Interim Measures and SAM. Most candidates did not answer the question adequately.

- For Professional Indemnity and liability type claims from Motor the average time to settlement is some years after the premium has been earned. Investment income for these classes is a significant contributor to the profitability of the class. Therefore, if a realistic estimate of the amount of funds which should be held, which together with the investment income earned on those funds will be enough to pay claims then the discounting of reserves is appropriate.
- However, discounting is only appropriate if a credible estimate of the payment profile of the claims and the investment income that may be earned can be made. Should only be applied where assets are available which are appropriate in amount and nature, term and uncertainty to cover discounted liabilities
- This enables the discount rate used to be justifiable by recent performance of such assets
- The Merits between discounting and not discounted can be summarised as:
- Undiscounted reserves:
    - A higher reserve can be held thereby deferring the payment of tax,
    - provide a margin for contingencies,
- Discounted reserves:
    - result in a higher "headline" solvency ratio,
    - may be perceived as a sign of weakness if most peer companies hold undiscounted reserves
    - provide a more accurate view of true profitability as investment income is a contributor to profit
- IFRS requires that provisions be set on a best estimate basis and discounting should be applied if it will make a material impact to the central estimate result.
- As a general guideline, when the discounted mean term of liabilities is expected to exceed four years, then estimates should be discounted.
- Interim measures follow the IFRS principle with regards to outstanding claims provisions,
- to calculate the IBNR set factors are given related to the net of approved reinsurance earned premium.
- SAM requires all provisions to be set on a best estimate basis including allowance for inflation and discounting. The SAM regulations do not expect the discounted mean term to exceed four years before discounting is applied
- There needs to be consistency in assumptions between discount rate determination and setting inflation rate assumptions

iii. Examiners' notes:

This section examined the reasons why differences could exist in capital requirements for your company and the target in the merger under Interim Measures, SAM and their view of the Economic Capital Requirement. Most candidates answered this question satisfactorily.

- Interim measures
    - Factor based formula
    - IBNR Factors are given, thus formula applied will not differ significantly on reserving risk in capital formula
    - Spreading of assets introduced at the end
    - Not as granular as SAM Formula
    - Approved Reinsurers only
- SAM
    - Factor based for some modules
    - Best Estimate Technical Provisions, thus formula applied could differ significantly on reserving risk in capital formula
    - Market risk calculated based on different classes of assets
    - No Spreading requirements - substituted with concentration risk module
    - Better allowance for diversification
    - Much more granular data requirements and homogenous grouping of business
- ECR
    - Company's own measurement of capital requirements
    - Can be based on internal model, multiples of the above, combinations of the above, reference to credit ratings etc.
    - Although same business lines but different underlying risk profile of portfolios e.g. less diverse motor book
- SAM uses VAR of 99.5% over one year, whilst our and target company economic capital could be calibrated to different metrics (aligned to different risk appetite/tolerance comment)
- SAM more granularly considers the assets held, as well as premiums written and reserves
- Target has been more prudent on setting reserves taking account of court award changes
- Target may hold riskier assets than company A/hold assets subject to a higher market risk module. From IM this seems to be the case
- Target may have been penalised on spreading requirements
- Target could hold reinsurance with companies that are non-approved based on Interim measures but in countries with equivalent status
- Target may hold more assets than company A
- Target may have higher forecasts in premium than our company
- The MCR factors for premiums written and reserves do not vary by class
    - …with very few exceptions
    - …although there is some variation in MCR factors according to size of premium, reserves and operational expenses
- Target may write slightly more premium than company A in classes with higher factors
- Target may hold more reserves than company A in classes with higher factors
- Target may write same business lines but different underlying risk profile of portfolios e.g. less diverse motor book

- Target may have greater volatility or more large claims due to inadequate underwriting
- ECR will differ due to management risk appetite and calculations of their own solvency requirement.

iv. *Examiners' notes:*

The factors that need to be considered in determining the final shareholding between the equity holders involved in the transaction was poorly answered by most candidates. Most candidates did not generate enough content that was specific to the merger and the question was answered too generically. Most candidates did not seem to understand the numerous quantitative elements affecting assets and liabilities which would apply to the valuation of the individual and merged companies.

- Although both companies underwrite similar classes there may be many differences between the companies which affect the value attributed to each company.
- The theoretical value of a company can be considered as the net asset value which can be calculated by taking the realistic value of assets and subtracting the realistic value of liabilities and the value attributable to future business (i.e. the value of management and goodwill in the business)
- The above would need to take account of the likely persistency achieved by each company (Lapse Rates)
- Premium strength and contract boundaries terms and conditions would need to be reviewed (Ability to re-rate to achieve efficiency)
- Target sets up discounted provisions (which result in lower reserves) but has set up additional reserves in respect of a recent court judgement
- Reserves of your company would have to be recalculated on this basis.
- Any other differences in reserve strength both for PI and motor would have to be adjusted for
- The value of assets may need adjustment depending on the depreciation accounting policies the two companies apply; however, the value of investments is likely to be on a market basis and not need adjustment.
- There may be tax differences or future credits which may enter into the value calculation
- Although both companies write similar lines the processing infrastructure in terms of IT systems may be different. E.g. one company may need huge investment to continue to operate - or incur significant expenses to migrate onto new system
- The markets the two companies operate in may be significantly different
- Prospects of the relevant distribution channels need to be considered in assigning value to the future business.
- Would need to investigate the possibility of any latent claims in both companies
- Need to investigate differences in RI structures - there could be unfavourable contracts in the past which need to be adhered to
- Will need to investigate the differences in operational costs between the entities
- Allow for any rules applied to staffing after allowance for competition commission
- Target solvency levels & risk appetite statements would also need to be aligned between the 2 businesses
- Any intangible items that may have to be removed or made redundant as part of the merger.

v. Examiners' notes:

This part of the question required candidates to perform a simple calculation to determine whether the merged entity could achieve its high-level objectives. In general, the calculation was rather erratically performed.

- Solvency Margin can be taken as 40% of Written Premium
- Solvency margin at the end of the year = Solvency margin at the start of the year + interest on opening solvency margin (net of tax) + gross insurance profit - tax on gross insurance profit - dividends declared

Evaluate this for the above, using written premiums in year of 100 and compare again to the target solvency margin

	Time 0	**Time 1**
PI% Contribution		40%
PI premium growth		20%
Motor premium growth		0%
PI insurance profit % premium		15%
Motor insurance profit % premium		2%
Premium growth%		8%
Solvency margin (Roughly 40% of Premium)	40%	40%
Tax rate %	28%	28%
Investment Return on SM%	10%	10%
Insurance profit % premium		8%
Dividend % net insurance profit		40%
Premium	845.00	912.60
Solvency estimate	**337.50**	**365.04**
Solvency margin by formula (projection)		**383.34**

Formula used boils down to S0 + (IR+IP)(1-t%)(1-d%) where S0 is start solvency, IR investment return, IP insurance profit, t% tax rate and d% dividend rate

END OF REPORT