

EXAMINERS' REPORT

June 2022 examinations

Subject F102 — *Life Insurance* Fellowship Principles

INTRODUCTION

The attached report has been prepared by the subject's Principle Examiner. General comments are provided on the performance of candidates on each question. The solutions provided are an indication of the points sought by the examiners, and should not be taken as model solutions.

QUESTION 1

i. Description of the profit testing exercise:

- Project all expected cashflows and profit flows for a single policy, including:
 - Premiums;
 - Upfront and regular expenses, including commission payments;
 - Claim payments; and
 - Investment income.
- The model would also need to allow for any solvency reserves that need to be set up for the policy.
- Allowance should be made for expected lapses.
- The net projected cashflows would then be discounted at a risk discount rate.
 - The discount rate should reflect the required return on capital and the risk attaching to the cashflows.
- The model would be run for several different model points to represent different policy variations.
- These results would then need to be grossed up based on the actual business mix and volume.
- The profit may be measured as a net present value, profit margin, internal rate of return or discounted payback period.
- This profit result would then be compared to the targeted profit levels or metric set by the company to determine the adequacy of the premium levels or pricing structure.
- Premium levels and expense loadings will then be varied until targeted profit levels are achieved.
- It is likely that a deterministic model will be used.

ii. Determining the cost of the option:

- The pricing model for term assurance business would be used to determine the premium to be charged for the extended term at standard mortality rates.
- In addition, the pricing model would be used to determine the premium to be charged for the extended term, using the expected mortality experience of policyholders extending their term.
- The model would have to be adjusted to allow for the proportion of lives expected to take up the option.
- Expense charges would be adjusted to allow for:
 - The cost of the alteration.
 - The extended premium payment term.
 - Any associated increases in commission payments.
- The cost of the option is the discounted value of the difference between the premiums that should have been charged for the actual mortality of those exercising the option and the standard premium rates charged under the policy.

This question was generally answered well by most candidates.

For part (i) most candidates focused on how to set up model points and derive the assumptions which wasted time as it was not required by the question. In addition, the question specifically asked how to perform the profit test, yet a large number of candidates did not mention profit criteria or how to determine whether the product was profitable.

For part (ii) a number of candidates mentioned the conventional method and North American method but didn't outline how to determine the cost. A number of candidates also mis-read the question and described how you would determine the overall premium with the option rather than determining the cost of the option.

QUESTION 2

i. Exclusions:

- War, terrorism, acts of violence, civil unrest.
- Pre-existing conditions.
- Hazardous past-times or sports.
- Aerial activity other than as a fare-paying passenger.
- Self-inflicted injury or attempted suicide.
- Criminal acts.
- Experimental treatments.
- Cosmetic surgery.
- Failure to seek or follow medical advice.
- Drug or alcohol abuse, although this might be difficult to ascertain.
- Accident and emergency treatment.
- Chronic conditions under PMI.

ii. Reasons for imposing exclusions:

- To manage the anti-selection risk.
 - E.g. associated with risks that are difficult to assess.
- To simplify and reduce underwriting exclusions or reduce the number of questions on the underwriting form.
- To reduce moral hazard - because of insurance people may be reckless in their behaviour.
- Some risks are difficult to price due to considerable uncertainties.
 - E.g. participation in a professional sporting event, or war/terrorism risks.
- Some risks could be difficult to price because of a lack of data.
 - E.g. under a CI plan the cancer cover will exclude skin cancer. A lot of skin cancer might not be reliably reported and so published statistics might underestimate the risk.
 - The impact of future advances in medical treatments might also be difficult to estimate.

- To reduce costs.
 - E.g. a typical disability income plan has a deferred period of at least 28 days. This excludes short term claims as a way of reducing the cost in order to make the benefit more affordable to a wider range of potential policyholders.
- It may be poor practice (or even illegal) to provide a benefit.
 - E.g. if the policyholder is disabled as a result of committing an illegal act.
- Payment may have been received from elsewhere.
 - May exclude claims for which the policyholder is already receiving compensation (say from an employer or through a structured settlement).
 - Over insurance could lead to moral hazard which could be difficult to price.

This question was answered well by the better prepared candidates. However, the majority of candidates did not provide enough distinct examples in part (i) or provide enough reasons in part (ii) to score well.

Furthermore, a number of candidates focused on non-disclosure and reasons to not pay out an insurance claim rather than on exclusions.

QUESTION 3

i. Factors to consider:

Pricing:

- The premiums charged will need to be sufficient to cover the benefits to be provided and the expenses and provide a profit (in most foreseeable circumstances).
- The current pricing basis will not be relevant to the new target market.
 - The new target market will include higher numbers of lower salaried blue-collar workers with worse expected mortality experience.
 - Claim volumes will be higher and expense loadings (especially fixed expense charges) will need to be adjusted appropriately.
 - Average cover level may differ and the approach to setting free-cover limits may need adjustment.
- A new pricing basis will need to be set, allowing for the differences in mortality experience and expenses expected.
- Any conscious cross-subsidies should be allowed for.
- A consultant or a reinsurer could help with the pricing.
- If the insurer gets the pricing wrong, because these are large schemes, it may impact its solvency.
- The insurer can include additional margins to allow for uncertainty.
 - However, it is possible that existing insurers already have good relationships with brokers in this target market, so getting new business may be difficult.
 - The pricing will thus need to be competitive to enter the new market.

- Competitiveness and marketability may be in conflict with profitability and solvency.

Administration:

- With larger schemes there will be higher volumes of administration, underwriting, and claims management.
- It may be necessary to develop new administration systems/processes, e.g. new underwriting skills will be required.
- The insurer will need to ensure that it has sufficient resources to perform these services.
- The insurer will need to decide whether the existing distribution channel is appropriate, and what administration will be carried out by the channel.

ii. Benefits of reinsurance:

- Limit the amount paid on any single claim, this may be important for senior executives with high benefits.
- Protect against aggregations of risk caused by having lots of workers in the same building and possibly exposed to dangerous substances or fire.
 - This risk may be higher for the new target market compared to the existing market
- Limit total claims payout in a period through stop loss reinsurance
- Reduce insurance parameter risk, which could be important as the insurer is entering a new market.
- Reduce claim payout fluctuations.
- Receive technical assistance, important for the expanding business where the insurer has no experience, such as:
 - Access to data, which could be used for pricing or reserving.
 - Access to pricing models or bases.
 - Assistance with underwriting and administration if new business volumes are significant.
- Reduce new business strain by reducing solvency requirements or through financial reinsurance
- Increase profits, return or risk-adjusted return on capital (by reducing risk cost or increasing volumes).
- Reduce the overall capital requirements by using a reinsurer's capital.
- Allow the insurer to separate out different risks from a product allowing the insurer to optimise its risk management and capital requirements.
- A financing arrangement with a reinsurer could help improve the insurer's solvency position.
- Reinsurance might help the insurer demonstrate its financial resilience/strength and attract more investors if this is required.

iii. Initial underwriting for group life compared to individual life insurance:

- For group life there is a very low risk of anti-selection, as the cover is likely to be compulsory, and hence underwriting can be more lenient in general.
- For individuals, financial underwriting is important and proof of income could be required.
- For group life, no financial underwriting is required as the benefits are based on an individual's salary.
- For group life there would be a Free Cover Limit, and covers below this would not need to be underwritten.
- There would be an "actively at work" clause for group covers, which reduces the risk of anti-selection.
 - If someone is not at work they may need to go for underwriting.
- For cover above the FCL, group underwriting could be similar to individual.
 - However, it is likely to be simplified, perhaps with just a health questionnaire
- You do not need to underwrite for occupation in group life as that is allowed for in the pricing.

Part (i) was answered very well by most candidates. There were many points that could have been made. Candidates who set out their answer clearly, dealing with pricing and administration separately, generally scored well.

Part (ii) was also generally well answered. It required applying bookwork to the specific details given in the question.

Most candidates were able to identify the main differences in underwriting approaches for part (iii).

QUESTION 4

i. Factors to consider:

- The nature, term and currency of the liabilities, and the most suitable assets that match the liabilities.
 - Liabilities include guaranteed benefits (sum assured and reversionary bonuses declared), future reversionary bonuses, terminal bonuses and life office expenses.
- Policyholder expectations for future bonuses will determine the extent to which assets with high expected (but volatile) returns should be included in backing liabilities for future bonuses.
- Policyholders will want the maximum returns and to earn a return of at least inflation
 - Competitor products and their investment strategies may influence the appropriateness of the current investment strategy.

- The company's free assets and risk tolerance will determine the extent to which free assets may be used to smooth bonuses in order to pursue a more aggressive investment strategy.
- Free assets will also determine the extent to which guaranteed benefits may be mismatched.
- Regulations may affect investment in certain assets and asset classes.
- Differences in the tax treatment of various assets may influence the preference for some assets over others.
- Availability of assets – as this is a developed country, it is unlikely that asset managers will be restricted by this.

ii. Modelling exercise required:

- The company must define the outcomes to be measured (e.g. probability of insolvency for a specified bonus philosophy) and the time horizon.
- Input assumptions for the liabilities and assets are required.
 - Assumptions should be best estimate and should not include margins.
 - For the liabilities: demographic assumptions, bonus philosophy.
 - For the assets: expected returns, variances, correlations, tax rates.
- The number of simulations must be high enough to enable probabilities of extreme events to be measured.
 - For each simulation, asset returns, interest and inflation rates are generated by the stochastic economic scenario generator/model for each future time period up to the time horizon.
- The starting point for the asset projection is the current split of assets (as it is being tested for appropriateness).
- The liability cashflow projection could use all policies, or model points of existing business, and new business.
 - For each policy, future probability-weighted cashflows are calculated (e.g. for decrements).
 - Future bonus additions will be based on projected asset returns and on a modelled algorithm that mirrors the company's bonus philosophy.
 - Life office expenses are projected by linking these to projected inflation rates.
- The model should produce net cashflows, assets, liabilities and solvency requirements and solvency level for each future period up to the time horizon.
- The company is thus able to measure the probability of various outcomes against its requirements e.g. probability of insolvency associated with a specific strategy (and expected bonus level).
 - If insolvency probability appears too high, the company should consider changes to its investment strategy.

iii. Guaranteed annuity option:

- The liability projections will now be based on a model point representing a 55 year old policyholder and typical single premium.
- The projection period is limited to 10 years and the number of simulations may be similar to before.

- For each scenario:
 - The value of assets and liabilities is projected (as before) up to the maturity date for the single model point to derive a projected maturity value.
 - Projected long-term interest rates at the maturity date should be produced by the stochastic economic scenario generator, from which a market price for annuities can be estimated at maturity (age 65).
 - At maturity the then-expected market annuity price is compared to the guaranteed annuity price; if the guaranteed annuity price is lower, it will most likely be exercised.
 - The cost of the guarantee can be calculated as the present value at maturity of the difference between the guaranteed annuity income and market annuity income:
 - $\text{Cost} = \text{Max} \{ \text{Projected Maturity Value} \times (\text{market annuity price} / \text{guaranteed annuity price} - 1), 0 \}$
- The average cost is the sum of all costs over all scenarios divided by the number of scenarios, the median or other percentile greater than 50% may be used if the insurer wants to be more conservative.
- The above cost is discounted to policy inception (at age 55) and may be expressed as a percentage of the initial single premium.

iv. Guaranteed annuity option:

- The guaranteed annuity option has positive value when market annuity prices rise above the guaranteed annuity price i.e. when market long-bond interest rates fall below the rate implied in the guaranteed annuity price.
- Options that mirror this guarantee include:
 - European call option on long bonds, with exercise price corresponding to price implied by the guaranteed annuity price, and term of 10 years.
 - European put option on long bond interest rates, with exercise price corresponding to interest rate implied by the guaranteed annuity price, and term of 10 years.
 - Swaption – option to swap floating rate returns at the option (maturity) date for fixed rate returns.
- The market value of such options (if available) could be used to estimate the cost of the guarantee offered by the life company.

Overall this question was answered reasonably well by most candidates.

Part (i) tripped up many candidates, who instead of writing about the factors as required, produced a standard answer on how to determine an investment strategy for this product. Some candidates produced a list of factors, without explaining them, as instructed.

Part (ii) was reasonably well answered by most candidates.

Part (iii) proved challenging for most candidates, who generally could not provide a clear explanation of how to use the model to cost a guaranteed annuity option, with many answers being too cryptic and vague. Candidates used terms such as “annuity rate” without being clear what this meant – some implied this to be an interest rate, while others implied it to be an

annuity price per unit income. Many candidates failed to make the obvious point that the maturity value must be projected to establish the projected annuity amounts.

Part (iv) was reasonably well answered by most, however, many candidates were too careless and imprecise in their answers, for example listing European call or put options, without specifying the underlying asset/instrument that the option is written on.

QUESTION 5

i. Surrender values should:

- Take into account policyholder's reasonable expectations.
- At early durations, not appear too low compared with premiums paid (taking into account any projections given at new business stage).
- At later durations, be consistent with projected maturity values.
- Not exceed earned asset share, in aggregate, over a reasonable time period.
 - Make an appropriate contribution to profit, if possible (and consistent with the other objectives).
 - Treat leavers and the continuing policyholders fairly.
- Take account of surrender values offered by competitors.
- Not be subject to:
 - Frequent change, unless dictated by financial conditions; or
 - Discontinuities over the duration of a policy.
- Not be excessively complicated to explain to policyholders or to calculate, taking into account the computing powers available.
- Be capable of being documented clearly.
- Avoid selection against the insurer, including lapse and re-entry risks.
- Take account of auction values that may be available.
- Comply with regulatory and professional requirements.
- Appropriately allow for the cost of administering the surrender.

ii. Suitability:

- The prospective policy value on a realistic basis is likely to be negative for an extended period of time because premiums are relatively small initially (increasing over time).
 - The proposal would therefore result in no surrender value for a relatively long time.
 - This is particularly true for young policyholders (as they have long expected policy durations and mortality rates that do not increase much at younger ages).
- As a result, the proposal may lead to policyholder dissatisfaction (if they expect a surrender value similar to premiums paid to date).
 - This may be problematic depending on the market practice in providing surrender values at early durations on whole life policies.
- Although there is no guarantee that the asset share will consistently exceed the surrender value:

- It is likely that the policy value on a realistic basis will generally be less than the EAS, making the surrender value affordable (when the EAS is positive).
- This also means that it is possible that no surrender value is payable even when the EAS is positive.
- The EAS is however likely to be negative for an extended period of time.
 - The company will then make a loss on surrender.
 - In this context, paying no surrender value at early durations minimises the loss on surrender while the EAS is negative.
- The difference between the EAS and the surrender value represents:
 - The accumulated value of profit made to date; plus
 - the present value of profit expected to arise in the future from the difference in the assumptions in the pricing basis and surrender value basis.
- The profit extracted on surrender is therefore consistent with the profit the company would have made had the policy stayed in force.
 - This is generous to shareholders (although they are exposed to lapse risk).
 - Leavers and the continuing policyholders are being treated equitably.
 - Policyholders that surrender may view taking credit for future profit as being excessive.
 - The proposal results in a cross-subsidy between surrenders at early durations (when the policy value is negative) and those at late durations.
- Surrenders are being discouraged:
 - At early durations because no surrender value is paid while the policy value is negative.
 - At later durations, because the surrender value is relatively small (due to the use of a realistic basis).
- Because policy values are calculated on a realistic basis:
 - The surrender values may be volatile over time because realistic bases are likely to change relatively frequently.
 - There may be discontinuities over policy duration (when the basis is changed).
 - It should avoid surrender and re-entry risk because the current pricing basis will be more prudent than a realistic basis.
- The surrender values will tend to the death benefit at longer durations.
- The surrender value is likely to be consistent with auction values that are generally calculated using the prospective method (although the assumptions used are likely to be different).
- It will also not be clear, up front, when surrender values first become payable, which may be difficult to explain to policyholders.
- The calculations should be relatively easy because the same methodology is likely to be used for setting up reserves, and it is not necessary to keep track of past experience.
 - However, setting and reviewing a realistic basis frequently can be challenging.
- There is no explicit allowance for surrender expenses, which should ideally be allowed for.

Most candidates did very well in part (i). However, several candidates did not state principles clearly enough in order to gain credit.

Most candidates struggled with part (ii). Candidates that did well in this part, were able to demonstrate a clear understanding of the progression of the policy value over the duration of the contract, the impact of the premium structure on the policy value and the relative values of the asset share and policy value (and did not use these two phrases interchangeably). Common errors included making generic comments (which already received credit in part (i)) or just reproducing material from the notes without taking the context of the question into account, for example many candidates suggested that there would be a maturity value on the whole life contract. Some candidates incorrectly suggested that there is a surrender penalty applicable to conventional products.

QUESTION 6

i. Consumer needs met:

- Converts a capital sum into a level income for the future lifetime of the policyholder.
- Useful for providing an income in retirement.
- The level annuity satisfies the need for certainty of income amount.
- The annual once-off bonuses could provide some compensation to annuitants for the increase on the cost of living.
- The annual dividend could satisfy the need for discretionary spending, some other annual outlay, or for unexpected costs.
- If there is a guarantee period or a spouse's annuity, this can provide for dependants on death of the annuitant.

Risks to an annuitant:

- The guaranteed benefit remains level over time and thus becomes less valuable over time due to inflation.
 - There is a risk that the benefit level turns out to be insufficient to cover living expenses over time.
- The amounts of the annual dividends are uncertain:
 - This makes financial planning difficult.
 - Dividend increases (if any) may be unrelated to inflation over time.
- Dividends could be low due to factors such as:
 - low investment returns.
 - higher than expected longevity; or
 - higher than expected expenses and expense inflation.
- The annuitant may mismanage the money they receive and run out of cash between annual payments.
- There is a risk that the company becomes insolvent and unable to meet its obligations to annuitants.
- There is a risk that the annuity was bought at a depressed rate, where the policyholder could not wait to time the purchase better.

- There is a risk that the product is poor value for money if the policyholder dies early and there is no guarantee period or spouse's annuity.
- The product is inflexible and cannot change to accommodate changing needs.

iii. Surplus arises from:

- Investment return surplus: Excess of actual investment return (over expected) on the assets at the beginning of the year, that is higher returns than expected.
- Mortality surplus: Expected annuity payments less actual annuity payments based on the mortality of policyholders, that is more deaths than expected.
- Expense surplus: Excess of expected expenses over actual expenses, that is lower expenses than expected.

Factors to consider:

- The timing of the benefit payments and expenses should be considered by allowing for the loss of excess investment return.
- The surplus should be calculated separately for homogeneous groups.
 - For example, amount of level annuity; age group at policy inception or duration in-force.
 - Need to ensure equity between different groups.
- Historical information needs to be kept on the premium bases for assessing expected experience.
- The amount of surplus to distribute in any given year, depending on what is specified in the contract, for example:
 - A proportion of the total surplus will be declared as the annual cash dividend, and the remainder might be retained by the insurer to be distributed to shareholders or to meet other business objectives
 - A proportion could also be used to fund a reserve for adverse circumstances and to support smoothing of bonuses.
- The insurer should ensure that the majority of the retained surplus is distributed over the lifetime of the policy as there would be no terminal bonuses for this business.
- Policyholders' reasonable expectations regarding the level of dividends, based on marketing material and past practise, amongst other things.
- Whether or how much of the surplus arising is non-recurring, and how to distribute that – for example declare as a special dividend to not create expectations.
- What competitors are doing or level of dividends on similar products, in order to remain competitive (supports new business sales and reduces complaints).

iii. Expense investigation:

- The first step is to identify all actual expenses over the year according to source of expense (e.g. cost centre).
- The insurer then needs to determine the actual expenses over the year attributable to the with-profits annuity business.

- Expenses can be divided into initial, renewal, termination (possibly) and investment expenses.
- Can also determine whether expenses are proportional to: size of single premium, size of annuity payment, funds under management, or number of policies.
- Commission expenses are excluded.
- Investment expenses can be accounted for through a reduction in the investment yield and could be excluded further from the investigation.
- The key expense items can be allocated to the relevant cells as follows:
 - Salary costs for staff only responsible for the with-profits annuity business can be fully allocated to the business.
 - Timesheets can be used to split salary costs for staff responsible for multiple lines of business.
 - Other staff not attributable to any particular lines of business (e.g. general management) can be allocated to overheads and apportioned pragmatically.
 - Property costs can take the form of actual rent or notional rent (in the case of owner-occupied buildings).
 - Property costs can be divided by the area occupied by each department (i.e. using floor space) and allocated into functional cells in the same proportions as salary costs.
 - Computer costs take the form of amortised new computer costs and ongoing costs.
 - Computer costs can be divided by usage of computers/ number of staff.
 - Once-off capital costs can be amortised and treated as overheads.
 - Exceptional once-off costs can be excluded if these are deemed to be non-recurring.
 - Overheads should be allocated in a pragmatic way e.g. in proportion to the allocation of direct expenses.
 - Marketing expenses can be allocated to the annuity product in proportion to size of new business premiums for example.
- The insurer may further consider separating the expenses into homogeneous groups of policies for calculating dividends where experience is expected to differ by group.
 - However, it is unlikely that expense experience will differ across homogeneous tranches of annuities.
- The reasonability of the results of the expense investigation can be checked by:
 - Comparing the sum of the expense allocations to different lines of business to total expenses in the accounts.
 - Comparing allocated expenses for the current year to previous years, investigating trends and expense inflation.

Overall, this question was reasonably well answered by most candidates.

Parts (i) and (ii) were mostly well answered, although many generic points were made in part (ii) which did not gain credit.

While many candidates performed well on part (iii), a straightforward application question, a number did poorly. This may have been due to poor time management in some cases.

QUESTION 7

i. Advantages:

- Assumptions are updated regularly and based on market conditions, thus are more relevant.
- The new approach provides information on the impact of market conditions on the ability of the insurer to meet its obligations to policyholders.
- The gross premium valuation method allows explicit future bonuses and expenses to be included, leading to reserves that are more appropriate and reflective of specific circumstances.

Disadvantages:

- More complex than passive valuation approaches and more costly to calculate.
- Results are more volatile compared to passive valuation approaches.
- Investment markets in the small, developing country may be illiquid making it difficult to set some market-consistent assumptions.

ii. Relative weaknesses of current approach:

- The solvency requirements are not explicitly based on a specified level of confidence of breaching solvency levels within a defined period of time, unlike a Value at Risk (VaR) approach.
- This makes risk management more difficult e.g. cannot easily define company risk tolerance.
- If based on experience in other countries, the factors may not be suitable for this country.
- The factors do not reflect the quality and extent of risk management, while this is likely to be reflected in a VaR approach.
- The factors do not fully capture policyholder risk profiles within classes e.g. mortality and lapse risks.
- The factors are unlikely to be updated regularly under a passive approach, thus may quickly become out of date compared to an active VaR approach.
- The asset discount factors are unlikely to adequately allow for differences in credit and illiquidity risk.
- The method does not clearly indicate the level (if any) of diversification between risks allowed for.
- Imprudent liabilities will result in inadequate solvency requirements, while a VaR approach should lead to higher solvency requirements to offset inadequate liabilities.

iii. Data required:

- Policy data for all the term assurance policies are required including:
 - Date of inception; age of policyholder and sum insured
- Model points might be used instead of actual data, however this might not be necessary given the small size of the portfolio.

Assumptions required:

- Mortality rate; lapse rate; expenses incl. renewal expenses, claim expenses and expense inflation; investment and discount rate.

Setting the discount rate:

- The discount rate will be based on risk free-rates.
- The risk-free rates will be based on the yield of government bonds of appropriate term.
- Adjustments may be needed for short-term anomalies.
- The insurer should use term-dependent rates based on the yield curve for government bonds.
- A yield curve may not be available for the term of all the insurance liabilities (although it is unlikely that 15-year bonds are unavailable).
- The insurer may therefore need to extrapolate the yield curve.
- Since this is a small developing country it is unlikely that a deep market for swaps will exist.
- It is unlikely that the insurer would be able to take credit for the illiquidity premium in corporate bonds due to the difficulty of matching liabilities given the small portfolio of term assurance policies and hence variability of experience, as well as the likely small corporate bond market in this small developing country.
- Allowance must be made for credit risk, due to default risk by the issuing government.

Overall this question was not answered well by most candidates.

Part (i) was answered reasonably well, although most candidates did not explain their answers well enough for an “outline” instruction.

Part (ii) proved to be challenging for most candidates, who generally did not appear to appreciate the implied assumptions and limitations of the current approach. Some candidates made their own assumptions and were dogmatic in their views, for example stating that the current percentages and discount factors are “arbitrary” and “subjective” and “out of date”, not appreciating that they may be based on a specific ruin probability for a model portfolio and updated regularly.

For part (iii) most candidates stated that the discount rate would be a “risk-free” rate, however many assumed that in this small developing country the market for corporate bonds and swaps would be bigger than that for government bonds, which is most unlikely.

QUESTION 8

i. Charges:

- Policy fee (fixed) deducted from premiums or from the unitised fund.
- Percentage premium allocation (possibly lower during an initial period to cover the higher initial expenses, higher thereafter).
- Bid-offer spread.
- Risk benefit charge.
- Surrender penalty.

ii. a. Mortality risk:

- The company is exposed to the risk that the number of deaths is higher than what it expected and priced for.
- The risk is higher where only limited underwriting is done with the short health questionnaire as limited underwriting is unlikely to capture sufficient health details of the policyholder to make an accurate estimate of mortality.
- The company is therefore exposed to an anti-selection risk.
- If selective withdrawals from healthy lives are more than expected this would also pose a mortality risk.
- The annual policy fee may not be sufficient to cover the mortality costs as well as all other costs, e.g.
 - If a greater-than-expected number of policyholders opt for the higher cover (assuming this will have a higher cost).
 - If the average age of policyholders is greater than expected.
- As this is a new insurer, it is unlikely to have much experience in these products, exacerbating the mortality risk.
- Small volumes of business, likely with a new insurer, would also increase this risk.
- The fact that the policy term is long (20 years) also exacerbates the mortality risk.
 - However, the risk will reduce over time as the unitised fund builds up.
- Poor performance on the with-profit fund will exacerbate the mortality risk (owing to there being a larger sum at risk).

b. Expense risk:

- The risk is that the total charge is inadequate to cover the cost of administration and other expenses.
- The risk is exacerbated by the fact that there is a mismatch in both nature and timing between the charges and the expenses.
- The company is also exposed to the risk of inflation being higher than expected on the administration and overhead expenses over the long term of the policies:
 - The extent of this risk will depend on how closely matched investment growth is to expense inflation.
- As the company is new it will have less knowledge of expected costs, increasing the expense risk.
- There is a risk that initial expenses might not be recouped if fund growth is not as expected.
- There is a risk that more policyholders than expected opt for the additional (and hence more expensive) underwriting at inception.
- If the company writes less business than assumed, and as a new company this is a significant risk, it might not have sufficient policies on the books to cover its overheads.
- Similarly if withdrawals are higher than expected prior to initial expenses having been recouped.

c. Investment risk:

- The risk is that investment returns are lower than expected and guaranteed bonuses cannot be met on surrender or maturity.
- Poorer than expected investment growth has several risks:
 - Lower than expected charges for the company.
 - Poor investment performance will lead to lower bonus rates and could lead to reputational damage, terminations and reduced new business.
- The zero market value reduction poses an investment risk to the insurer, as it would be exposed to an anti-selection risk of surrenders after a market crash.
- The company is exposed to the credit risk on the counterparty of the derivative instruments used to match the guaranteed maturity value (if over-the-counter instruments are used).
- If the match is not perfect the company will still be exposed to some residual investment risk.
 - It may be difficult to find derivatives of the right term and type to match the assets of the unitised fund.

In part (i) many candidates suggested an investment management charge. However, as this would be a percentage of the fund this is the same type of charge as the one being used. Several candidates wasted time by giving more than the number of charges asked for (those in excess of the number asked for gained no credit).

In part (ii) several candidates did not provide a description as required, but simply listed items such as anti-selection. This does not answer the question and did not gain credit. Overall the better prepared candidates scored reasonably well on this question.

In part (ii) the better candidates performed well, but generally too few distinct points were made. several candidates failed to make it clear that it is experience being worse than expected which poses risk rather than “high expenses” etc. Some answers to this part (and others) were very badly written, making it difficult to understand the points being made.

END OF EXAMINERS’ REPORT