

EXAMINERS' REPORT

November 2019 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. The results may be used for:

- Updating the pricing basis
- Revising product design, for example setting discontinuance terms
- Changing the product mix/ launching new products
- Revising the underwriting process
- Implementing or improving retention activity
- Changing the marketing message, target market and/or distribution channel
- Revising sales procedure in terms of training and selection of distributors, wording and format of sales literature
- Revising the mechanics of any commission payments and clawbacks
- Improving the wording of policy contracts
- Improving the adequacy of staffing resources to better carry out policy administration
- Improving actuarial models
- Updating the reserving basis
- Improving risk management governance and controls
- Determining the asset shares of remaining policies
- Model office work, for example monitoring profitability, embedded values, projections, asset-liability management, bonus distributions etc.
- Amending premium collection methods

ii. Analysis of persistency:

- The process would begin with collecting the data across all policies that did not end due to death or maturity.
- Data will be collected for more than the five years under analysis, and should be collected over a period which is long enough to ensure that the data is credible while remaining relevant.
- Data collected will then need to be split or analysed as follows:
 - By type of contract, particularly given that the insurers sells both protection and savings products.
 - The policies will also need to be analysed in terms of duration in force.
 - Sales method and target market should be considered.
 - This is particularly important given that the insurer sells to both individuals and employer groups – which are likely to have different persistency characteristics.
 - Other factors such as the premium payment method, frequency of premium payment, premium/benefit size, results of initial underwriting, original term of the contract or demographics could be considered.
- The data cells used must retain their credibility, while displaying homogeneity within each cell.

- The first year withdrawal rates will be calculated by taking the number of policies that withdrew within their first policy year across the time period, and dividing by the number of policies issued during the time period under analysis.
- The second and subsequent year withdrawal rates will be calculated accordingly by considering the number of policies that withdrew during the considered year divided by the number in force at the start of the considered year.
- It will be useful to consider the withdrawal rates for each product before and after the introduction of the endowment assurance.
 - The reduced persistency may be due to the new product cannibalising market share from the insurer's other products.
- The persistency analysis must also take into account any changes in the competitive and economic landscape within which the insurer operates in order to understand the observed trends.

Part (i) was bookwork and generally well answered by most candidates. Some candidates gave high level general comments such as "providing management information" or "identifying trends" which did not earn credit.

Part (ii) was fairly well answered by most candidates, although many candidates focussed only on the last 5 years' experience data, thereby missing out on the opportunity to compare the experience of the other products before and after launch of the endowment assurance.

QUESTION 2

- i. The following product features would need to be specified in the design of the product:
- Nature of benefit payments: Level, increasing at a fixed rate, increasing in line with an index or some combination thereof.
 - Death benefits or guarantees: For example, first 60 months payments are guaranteed.
 - Spouse's reversion: Percentage of benefit amount, number of spouses covered (unlikely to offer this as a default option).
 - Any enhancement for impaired mortality.
 - Maximum age.
 - Expense charge design.
- ii. Lower than expected premium income may be due to:
- Lower than anticipated capital value of pension at the point of purchase if:
 - Tax at retirement is higher than anticipated.
 - Deductions from fund values at retirement exist, for example to settle a housing debt or a divorce settlement.
 - Investment returns have been lower than anticipated prior to retirement (in the defined contribution context).
 - Contributions to pension schemes may be lower than expected.
 - More pension scheme members take the maximum amount in cash permitted by regulations than expected.
 - Low take up of the default option because pension scheme members elect to purchase open-market annuities:
 - Particularly members who have their own brokers and members who want a different design feature of the annuity (for example increasing vs level benefit payments).
 - Default annuities are a new feature so more marketing may be required.
 - Members may get better rates elsewhere.
- iii. Effect of premium volumes being different than expected:
- If premium volumes are lower than expected:
 - Profits may be lower than anticipated.
 - Fixed expenses and development costs may not be covered.
 - Percentage of premium charges may be inadequate.
 - Investment freedom may be reduced.
 - If premium volumes are higher than expected:
 - The company may experience capital strain depending on how onerous solvency requirements for this type of business are.
 - There may be pressure on administration systems and servicing of customers may be compromised.

iv. Other risks relating to the product:

Mortality and longevity:

- Mortality may be lighter than anticipated.
- This may arise due to over-estimation of base mortality or under-estimation of mortality improvements.
- The company may have little previous experience of mortality for this target market.
- Longevity risk is exacerbated by the risk of anti-selection, if members in poor health elect income draw down products.
- Guaranteed death benefits expose the insurer to the risk of higher mortality early in the policy term.

Source of business:

- There is going to be a concentration by source as one would anticipate a large number of policies arising from each pension scheme.
- There may be some correlations between policyholders in terms of annuity amount and mortality early in the term. Although this is only really a downside risk if there are guarantees.

Investment returns:

- Assets that match the liability may not be available, particularly if the discounted mean term is long.
- Matching assets may not be available for the benefit increase structure of the insurer.
- If following an unmatched strategy, the insurer is exposed to:
 - Reinvestment risk;
 - Risk that investment returns are lower than anticipated; and
 - Movements in assets that may create solvency difficulties.

Expenses:

- Base expenses may be higher than anticipated.
- Expense inflation may be higher than anticipated.

Business volumes for other business:

- Business volumes on other annuity and income draw down products may be reduced.
- Particularly if brokers are angered by the introduction of a no commission product and recommend products from other insurers to customers.

Competitive pressures:

- Competitive pressures to acquire the business from pension funds may encourage the insurer to reduce premium rates; or
- Offer additional guarantees on the product increasing the risks relating to the product.

Reinsurance/risk transfer:

- Reinsurance may not be appropriate to manage the risks.
- Longevity swap may be the preferred risk transfer measure, but may not be available.
- Reinsurer may default on its obligations.

Reputational risk if product does not meet the expectations of policyholders:

- No advice is given at the sales stage of this product, so members may misunderstand the terms and conditions of the policy.
- Policyholders may select high cash lump sums resulting in low annuity payments and hence the product failing to meet their expectations.
- Inflation may erode purchasing power, resulting in reputational risk (even for an inflation-linked which typically increases annually).

Fraud:

- Families may claim the pension benefit after the pensioner has died.

Regulation:

- Regulation may permit entities other than life insurers to compete for example pension schemes and may result in regulatory arbitrage.

This question required candidates to read the question carefully and plan the answers for all four parts. The reference to “other” risks in part (iv) would have indicated this. It was clear that many candidates did not plan their answers and needlessly lost marks for answering one part of the question in the wrong sub-section. Many candidates did not seem to understand what a product feature is and others lost marks through only answering half of part (iii). Candidates are reminded that question wording is very deliberate and they must answer the question that is asked, not the one they think should follow logically. A disturbing number of candidates showed a complete lack of understanding of single premium products generally, annuities in particular and how a compulsory purchase annuity would work specifically.

QUESTION 3

- i. The reserve will be made up of two elements, a unit reserve and a non-unit reserve.

Unit reserve:

- The unit reserve would be equal to the value of the units held on the valuation date, calculated by multiplying the number of units held by the bid price of a unit on that date.
- This would ensure that, for a contract maturing on the valuation date, a unit reserve is being held sufficient to cover the maturity benefit.

Non-unit reserve:

- A non-unit reserve is necessary if expenses are likely to exceed charges at any future time.
- A non-unit reserve is also necessary because there is a minimum guaranteed death benefit, of a fixed amount, that may exceed the bid value of the units.
 - This is particularly so at early durations when the guaranteed death benefit is likely to be significantly higher than the bid value of the units.
- The non-unit reserve would be calculated by determining all the non-unit cash flows arising under each contract, allowing for decrements. These cashflows include:
 - Unallocated premiums, mortality charges and any other charges received (for example annual management charge, bid/offer spreads etc.)
 - Expected renewal and claims expenses
 - Expected death benefits
 - Any profits/losses on surrender or part-surrender
- Projected cashflows will most likely be discounted at the risk-free rate.
- If the discounted value of the projected net cashflows is negative the regulator may require the insurer to zeroise (set the present value equal to zero) on a per policy basis or on a portfolio basis.

- ii. Suggested approach for reserving for the investment guarantee:

- A stochastic model would be the preferred approach to determine the reserve for any shortfalls in the value of the unit fund relative to the guaranteed minimum maturity value.

Reasons why a deterministic model would be inappropriate:

- Under a deterministic model the future value of the fund may be projected using the expected level of investment returns less charges based on the expected asset allocation for the investment fund.
- The fund value projected on this basis is likely to exceed the minimum guaranteed value at maturity, resulting in a zero reserve for the investment guarantee.
- Although a few investment outcome scenarios can be tested using a deterministic model, the scenarios selected are subjective and it is difficult to assign a probability to them, in addition this type of model is unlikely to give a sufficient

range of investment outcomes to determine the reserve for an investment guarantee.

Use of a stochastic model will produce a range of outcomes of fund values based on the simulated investment returns, a number of these outcomes will reflect a shortfall in the unit fund compared to the guaranteed minimum maturity value.

Use of a stochastic model in this regard could follow the approach outlined below:

- A stochastic model would project the unit fund using many different simulated investment scenarios, where the future investment returns are governed by a probability distribution function.
- The assumptions underlying the model should reflect the investment strategy of the unit fund.
- The shortfall relating to the investment guarantee (i.e. where the fund value lower than the guaranteed minimum payment at maturity) will be determined for each investment scenario.
- The projected future shortfall may be reduced by the projected value of future charges on the unit fund relating to the investment guarantee.
- The present value of the shortfall can be determined by discounting the projected shortfalls at a suitable discount rate.
- The probability of the policy maturing should be taken into account through relevant decrements (for example mortality and withdrawals).
- Repeated simulation (1000s of simulations) will generate the probability distribution of outcomes for the reserves for the investment guarantee.
- The reserve for the investment guarantee could be set as the expected (i.e. average) present value of the simulated outcomes.
- If more prudence is required at point on the distribution of outcomes representing the regulator's risk tolerance for example 75% level could be chosen.
- Care should be taken in the level of confidence placed on the results as they are sensitive to distribution and the calibration of the parameters for the investment returns.
 - Since this is a developing country there may not be sufficient data available to calibrate the model with confidence.

This question was relatively poorly answered. In general candidates structured their answers poorly and failed to focus their answers on the key aspects of the question. This resulted in wasted time on unnecessary points and missing important points.

For part (i) stronger candidates explained the method for reserving for both the unit fund and non-unit fund in a methodical manner, while weaker candidates discussed reserving in general. A number of candidates wasted time by giving too much detail on general issues for reserving.

In part (ii) the majority of candidates failed to give sufficient detail in explaining the method stochastic modelling.

QUESTION 4

- i. The approach for determining surrender values should take the following principles into account:
- For both methods, whether the principle that the surrender value should take policyholder reasonable expectations into account is met depends on whether the calculated surrender values are consistent with the information provided to customers at the sales stage.
 - Both methods are likely to meet this principle that the surrender value should not appear too low compared to premiums paid at early durations by definition of the surrender value.
 - Traditional products are unlikely to meet the principle that the surrender value should be consistent with projected maturity values at later durations.
 - The guaranteed maturity value is should be higher than premiums paid as it takes investment earnings over the term of the policy into account.
 - New-generation products are likely to meet the principle above as the prospective surrender value is likely to progress smoothly towards the maturity value over time.
 - Traditional products are unlikely to meet the principle that the surrender value should not exceed the earned asset share in aggregate, over a reasonable period.
 - As, the surrender value is likely to be higher than the asset share at early durations and lower at later durations in the policy term.
 - New-generation products are likely to meet the principle above as the prospective method is likely to be lower than the earned asset share.
 - The traditional products do not meet the principle that the surrender value should produce a reasonable contribution to profit of the insurer and maintain equity with continuing policyholders and shareholders.
 - There will be losses at early durations and excessive profits at later durations.
 - Whether above principle is met for new-generation products depends on whether the basis used for the prospective method allows the insurer to recover the losses at early durations and produce a profit that is not excessive after the second policy anniversary.
 - Traditional products are unlikely to meet the principle that the surrender value should avoid selection against the insurer.
 - As early surrenders are encouraged and later surrenders are discouraged.
 - For new-generation products surrenders prior to the second policy anniversary may be encouraged, but the effect may be less severe than for the traditional products.
 - Surrender values for traditional products are not consistent with those for new-generation products, thus do not take the approach taken by all competitors into account.
 - Consistency of surrender values across new-generation products depends on the basis used for the prospective method.
 - Traditional products are likely to meet the principle that the surrender value should avoid discontinuities by duration.

- New-generation products are unlikely to meet this principle as there is likely to be a discontinuity at the second policy anniversary where the method changes.
 - Both methods are likely to meet the objective that the surrender value should not be subject to frequent change, unless the basis for the prospective method is changed frequently.
 - Both methods are likely to meet the objective that the surrender value should not be excessively complicated to calculate, unless the basis is complicated for the prospective calculation for the new-generation products.
 - Both methods are likely to meet this principle that the surrender value should be capable of being clearly documented.
- ii. Profit arising for each of the bases under consideration for the prospective method of determining surrender values:
- The total profit retained by the insurer is the excess of the earned asset share over the surrender value paid ($EAS - SV$)
 - This can be separated into two parts: the profit earned to date ($EAS - SV^{(p)}$), and the capitalised value of the profit that will arise in the future due to differences between the original premium rate assumptions and the surrender value assumptions ($SV^{(p)} - SV$), where $SV^{(p)}$ is the prospective surrender value on the original premium basis.
 - At early durations there will be a loss on surrender where the asset share is lower than the premiums paid to date or the prospective surrender value.
 - After early durations the profit earned to date is the difference between actual experience and that assumed in the original premium basis.
 - The value for capitalised future profits will be:
 - zero if the original premium basis is used for determining the surrender value; and
 - equal to the expected future profits as if the policy had not been surrendered, if the best estimate of future experience is used.
 - Depending on how the expenses relating to the policy surrender are allowed for in the charge for the surrender, these expenses may reduce the profit.

Part (i) was poorly answered by many candidates. The question related to a relatively straightforward application of the bookwork on surrender value principles to two example products. Candidates who approached the question in a systematic way and explained the extent to which each product meets each of the surrender principles scored well, with some even able to earn full marks for the question. A very large number of candidates however merely stated the theory, with little reference to the question and no substantive explanation of how each product meets each of the surrender value principles, and consequently were not able to score very well.

Part (ii) was bookwork, but answers were largely a “hit-or-miss”, with candidates either getting close to full marks or close to zero. Those candidates that took a structured approach to work through each of the components of profit at the point of surrender scored well.

QUESTION 5

i. Description of bonus types:

Regular reversionary bonus:

- A regular reversionary bonus is a bonus that is declared on a regular basis, usually annually, during the lifetime of the contract.
- Once declared it attaches to the benefits and is guaranteed.
- It may be declared as a percentage of basic benefit and/or any bonuses already declared (using a simple, compound or super compound method).

Special reversionary bonus:

- A special reversionary bonus is a once-off/irregular increase to the sum assured.
- It could result from surplus from an isolated event for example restructure of a fund or some investment windfall.
- Should declared and communicated in a way that does not change policyholders' reasonable expectations.

Terminal bonus:

- A terminal bonus is an addition to the benefit payable, but only determined at the time of the claim or maturity.
- In theory this implies a potentially constantly changing bonus. In practice this does not happen, but even so a company will not guarantee to maintain the bonus at any particular level.
- It is particularly useful for distributing profits that come from volatile sources, such as capital gains on equity shares.
- The bonus may vary by term and duration.
- It is often used to bring the policy value in line with the asset share at date of maturity/claim.

ii. Allowance in pricing:

Regular reversionary bonus:

- The pricing basis may include an explicit margin to price for some minimum bonus every year.
- This will be achieved through a reduction in the interest rate.
- This will be particularly the case if policyholders' reasonable expectations include a regular bonus.
- Any margins for prudence in the basis may implicitly allow for regular bonuses to be declared if emerging experience is better than the prudent assumptions.

Special reversionary bonus:

- It is unlikely that this will be allowed for explicitly in the pricing, since:
 - any historic special bonuses would typically have been granted without creating an expectation of this being a regular feature of the product.

Terminal bonus:

- It is unlikely that this will be priced for explicitly.
- Unless, however, it has become well known that there is a terminal bonus payable on every claim at this life office, which one can argue changes the reasonable expectations of the policyholder.
 - This might be the case for a company that operates with-profits business, with no regular or special bonus declarations.

iii. Impact on choice of bonus type:

- Once a reversionary bonus is declared it becomes part of the guaranteed benefits under a policy, and will therefore be included in the supervisory reserves.
- Terminal bonuses will not increase the supervisory reserves.
- Given the company's high level of free reserves and investment approach, it is likely that it invests in riskier asset classes and does not match assets and liabilities closely.
- The company might prefer to postpone distributing bonuses and lean towards more terminal bonuses, since:
 - investment returns on riskier asset classes may be volatile;
 - if decreases in asset values are not matched by decreases in liabilities, the solvency position might deteriorate.
- The company may also want to add any surplus arising to free assets in order to maintain its solvency position or to use a strong level of free assets to make higher risk investments in the hope of generating higher returns. This will make it lean towards postponing the surplus distribution.
- Alternatively, since the insurer has a healthy solvency margin it may tend towards declaring regular bonuses rather than at the end of the policy term in order to improve the marketability/sales of their product.
- However, the impact of higher supervisory reserves on the solvency margin and new business strain must be considered.
- The company is therefore likely to use a low level of regular reversionary bonus, in conjunction with high terminal bonuses on its endowment assurance portfolio.

Part (i) was bookwork and answered very well.

Part (ii) was also answered well, although many candidates only considered either explicit or implicit allowance for bonuses and not both.

Part (iii) was answered satisfactorily, but many candidates struggled to articulate their arguments clearly. Many wasted time discussing various investment strategies required by a given bonus philosophy, instead of answering the question of how the investment strategy might impact the choice of bonus.

QUESTION 6

i. Liability characteristics and matching assets:

- The insurer would look to match assets and liabilities as closely as possible. The extent to which the insurer will deviate from this fully matched approach will depend on its risk appetite and free capital.
- The nature of the benefits is without-profit, and this is best matched by fixed interest stocks.
- Fixed interest stock issued by government should be risk free.
- Corporate bonds might be considered if the insurer is willing to accept (and hold capital for) default and illiquidity risk in order to enhance returns.
- If the benefits for any of the products are linked to an index (for example index-linked immediate annuity) then these liabilities are best matched by index-linked bonds.
- The term of suitable fixed interest stocks depends on the outstanding term of policies and annuities issued by the insurer:
 - Term assurance policies may have terms of less than 10 years.
 - Immediate life annuities and whole of life policies are likely to have terms greater than 10 years.
- Future insurer expenses are likely to be inflation-linked, and these are best matched by index-linked bonds of suitable terms or a mix of real assets that includes a limited exposure to equities.
- Currency is likely to be local, and hence assets need to be of the same currency.
- Shorter-term liabilities (of less than one year) and working capital are best matched by money market stocks:
 - Money market stocks are highly liquid in nature, have stable capital values and are hence a good match for short-term liabilities.
- In practice it might not be possible to find fixed interest stocks of long enough term for the annuities:
 - The insurer will then need to consider whether to accept (and hold capital) for the term mismatch or find alternative investments (for example, foreign bonds of long duration with a currency hedge).

iii. Director's proposal:

- Despite yielding negative returns, there is merit in using bonds to match without-profit liabilities:
 - Returns are fixed in monetary terms and the insurer is reducing the risk of insolvency and not meeting benefits by matching appropriately.
- Current bonds held by the insurer may have been purchased at higher yields to maturity:
 - Selling these now could trigger capital gains taxes that would be avoided by holding the bonds to maturity;
 - There may be significant other transaction costs in selling existing assets and purchasing equities.

- Negative nominal yields do not imply that real yields will be negative as investors might be anticipating a period of deflation.
- The proposal is to significantly mismatch by nature, and the extent to which this can be done depends on:
 - The insurer's solvency level and risk appetite.
 - Regulation.
- There is no guarantee that returns can be improved by investing in equities:
 - Equity returns, even over long periods, can be highly uncertain and risky.
 - Low bond returns may signal investor concern for other assets (such as equities).
 - The risk of insolvency is likely to be too high.

Part (i) was bookwork and answered well by most candidates. Candidates, who scored poorly, spent too much time detailing the nature of the liabilities as opposed to the assets. Part (ii) was poorly answered by most candidates. It was evident that many candidates did not understand the meaning or implications of "negative yields".

QUESTION 7

i. Medical conditions are likely to include:

- Cancer
- Coronary artery by-pass surgery/graft
- Heart attack
- Kidney failure
- Major organ transplant
- Multiple sclerosis
- Stroke

ii. Needs of the new target market:

- To some extent the new target market will have similar needs for insurance to the existing target market.
 - For example, funding the cost of a change in life style or specialist medical equipment following a severe medical event or paying off a mortgage or student loan.
- However, they are less likely to have as significant needs to provide cover for their dependants, than the existing target market.
- The new target market is younger, and on average will have less disposable income.
 - Therefore they will be looking for cheaper insurance, which the stand-alone product will offer.
- The new target market will be less likely to want to use a broker/agent to sell them a policy.
 - They would prefer to purchase online, as they do with many other products they purchase.
- They would prefer a quick process, with less medical underwriting which is offered by this product.
 - The less strict underwriting will however lead to a higher price, which is counter to what they are looking for.
- The 15-year term is more likely to tie in to the time horizon of younger people.
 - Whole of life would not feel like a necessary purchase to them.

iii. Existing underwriting process:

- The existing product and process will be fairly traditional and extensive compared to the new product.
- There will be an underwriting questionnaire.
 - This will probably be completed with the broker, using pen and paper.
- For larger sums assured, or when risks are identified in the questionnaire.
 - There may be a medical exam by a doctor or a nurse.
 - There may be medical tests (blood, ECG, chest x-ray, etc.)

- The insurer thus most likely load premiums, rather than declining cover.
- Financial underwriting may be required to ensure that the level of cover is appropriate given the annual salary of the applicant to prevent over-insurance.
- It is likely that a human underwriter will assess many of the applications.

Changes likely for the new product:

- The insurer is likely to rely on an underwriting questionnaire which would be a lot shorter.
- It is likely that the insurer will limit the sum insured for this product.
- The process could have “accept” / “decline” rather than adding loadings.
- Given that the questionnaire is online, it could be dynamic and only ask certain (additional) questions if disclosures made necessitate this.
- It is likely that more of the underwriting process will go through an underwriting engine, rather than a human underwriter.
- Claims underwriting may be required to ensure that any material non-disclosures at inception are dealt with appropriately.

iv. Areas that the regulator would investigate and monitor to ensure that customers are treated fairly in relation to this product:

- Terms and conditions of the product in terms of whether they are clear and fair.
 - For example the reasonability of the length of the waiting period, if any.
- Premiums of the product, relation to value for money of the product.
 - This product only covers four core conditions and at a lower sum insured than the other product and therefore should have a lower premium.
- Sales and underwriting procedures, particularly the processes in relation to the online sales.
- Information given to customers at the point of sale, in terms of whether it is clear and easy to understand.
- This is a complex product and it is important to ensure that customers understand the complex aspects of the product, for example:
 - Claims conditions as the lay-person’s interpretation of a heart attack may be different to the medical definitions used for the claims’ conditions.
 - Disclosures relating to exclusions, particularly for pre-existing conditions.
 - Conditions and disclosures relating to reviewable premiums.
- Rating factors used to differentiate premiums are justified by experience and sufficient data and that there is not unfair discrimination in the rating factors.
- The claims process is not unfair or unduly onerous while protecting the insurer against fraud, for example:
 - The process for verifying the declaration of health information at the claim stage.
 - The time taken to pay claims.
 - The number and reasons for repudiating claims
- Potential risk from outsourcing arrangements for online sales or claims processes.

This question required candidates to apply their knowledge to a particular product. Better candidates were able to structure their answers to be relevant to the specific product. Part (i) was bookwork and well answered.

In part (ii) a number of candidates gave points on general needs of the target market and missed points on the needs met by the critical illness product. Many candidates failed to structure their solutions effectively resulting in wasted time by repeating points.

In part (iii) stronger candidates were able to demonstrate their understanding of the underwriting process through clearly explained points.

The common mistakes for weaker candidates in part (iv) were listing potential regulations or requirements rather than areas to investigate or monitor; giving general points around treating customers fairly rather than tailoring the answer to the product in the question and giving points on monitoring solvency.

QUESTION 8

i. Risks to the policyholder:

- Benefits not received due to:
 - Policyholder living much longer than expected and hence, because the monthly income is not guaranteed for life, money could run out.
 - There is no maximum withdrawal rate so funds can be depleted earlier than expected.
 - Insolvency of the insurer.
- Benefits lower than expected due to:
 - Poor performance of the assets underlying the units resulting in lower benefit payments.
 - Policyholders may select investment funds that poorly reflect their risk appetite and/or need for capital protection, resulting in volatile investment returns.
 - The unit fund being eroded by fund management charges, particularly if fund management charges are revised upwards by the insurer.
 - Taxation changes impacting on amounts received.
 - Income received in real terms can be eroded due to high inflation given that the return of the assets may not necessarily be inflation-linked.

ii. Marketability and competitiveness:

- The flexibility provided by the following features of the product is likely to increase the marketability of the product:
 - Withdrawal percentage for monthly income.
 - Switching of portfolios.
 - Transfer of funds to another insurer.
- The following features of the product are likely to negatively impact on the marketability of the product:
 - Variable charges (increases the risk that charges may deplete the fund value).
 - No underlying investment guarantees (increases the investment risk for the policyholder).
 - The product terms and conditions and product risks are relatively complicated and may not be easy for a customer to understand.
- The competitiveness of the product is mainly influenced by the level of charges.
- Differentiating product features are also important.

- The insurer may need to consider accepting a lower profit margin or introducing attractive innovative features to this product in this competitive environment.

Profitability and financing requirements:

- Charges need to cover expenses (including a contribution to fixed costs) in most foreseeable circumstances and provide a profit margin.
- Profit margins for these policies are likely to be low due to the highly competitive nature of the market.
- There is a mismatch between the charges and the expenses, particularly due to high initial costs and the monthly fund management fee.
- The profitability of this business is therefore sensitive to investment experience, variation in actual expenses amounts and expense inflation and transfers to other insurers.
- This risk is mitigated by variable charges, although it may be difficult to implement increases in the charging structure in practice due to marketability and competitiveness considerations.
- Financing requirements for these policies will depend on the extent of mismatching between charges and expenses.
- The insurer may use the following techniques to reduce the financing requirements for this business:
 - Actuarial funding.
 - Negative non-unit reserves (if permitted by the regulator).

iii. Impact on assumptions for calculating the non-unit reserves for supervisory reporting:

Investment return on the unit fund:

- The estimate of the expected returns on the unit fund over the projected term of the policies would need to be adjusted to reflect the change in expected future economic conditions, taking the following into account:
 - Asset mix for the investment portfolios and spread of policies across investment portfolios.
 - Change in the volatility of future investment returns.
- The inflow amount for charges will depend on the investment return and withdrawal rate from the unit fund.

Rates of withdrawal on the fund:

- The expected rates of withdrawal on the fund may be reduced if policyholders are more conservative in poorer economic conditions.
- The expected withdrawal rates may increase if there is an increase in inflation and a higher income is required to meet expenses.

Expenses and expense inflation:

- Expense inflation may be higher in poorer economic conditions.
- Expense inflation assumption should be consistent with investment returns and discount rate.

- Allowance for overheads may need to be increased if business volumes for all products sold by the insurer are reduced in poorer economic conditions.

Persistency/transfer rates:

- Actions of competitors to maintain business volumes in a poor economic environment (for example reducing charges) may impact on the transfer rates.

Discount rate:

- The risk-free rate will change to reflect the economic environment.

Margins:

- A higher margin for prudence reflecting the uncertainty relating to the assumptions may be appropriate.

Part (i) was a straight-forward bookmark question, where there were many points which could have been made and in general well-prepared candidates did well on this question.

Part (iia) was generally well answered with the majority of candidates able to describe the marketability of the product due its distinct product features. However, part (iib) was poorly answered, with the majority of candidates making very high-level comments around the profitability and financing requirements of unit-linked products in general rather than referring to the specifics of this product.

Part (iii) was very poorly answered. The majority of candidates mainly focused on particular assumptions (e.g. investment return) and provided too much detail on particular assumptions rather than ensuring that they covered the full basis of assumptions at a higher level which in general caused them to score more poorly on this part.