

# **INSTITUTE AND FACULTY OF ACTUARIES**

## **EXAMINERS' REPORT**

September 2018

### **Subject CA1 – Actuarial Risk Management**

#### **Paper One**

##### **Introduction**

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

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

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

The report is written based on the legislative and regulatory context pertaining to the date that the examination was set. Candidates should take into account the possibility that circumstances may have changed if using these reports for revision.

Mike Hammer  
Chair of the Board of Examiners  
December 2018

**A. General comments on the aims of this subject and how it is marked**

1. The aim of the Actuarial Risk Management subject is that upon successful completion, the candidate should understand strategic concepts in the management of the business activities of financial institutions and programmes, including the processes for management of the various types of risk faced, and be able to analyse the issues and formulate, justify and present plausible and appropriate solutions to business problems.
2. This subject examines applications in practical situations of the core actuarial techniques and concepts. To perform well in this subject requires good general business awareness and the ability to use common sense in the situations posed, as much as learning the content of the core reading. The candidates who perform best learn, understand and apply the principles rather than memorising the core reading.
3. The examiners set questions that look for candidates to apply the principles specific to the situation set out in the questions, having read the question carefully. Many candidates gain few marks by writing around the subject matter of the question in a more general fashion. Detailed specialist knowledge is not required and nor is very detailed development of particular points.
4. Good candidates demonstrate that they have used the planning time well to understand the breadth of the question and to structure their answer – this is a big advantage in making points clearly and without repetition. This also enables candidates to use the later parts of questions to generate ideas for answers to the earlier parts.
5. Time management is important so that candidates give answers to all questions that are roughly proportionate to the number of marks available.
6. The comments that follow the questions concentrate on areas where candidates could have improved their performance. Candidates approaching the subject for the first time are advised to use these points to aid their revision.
7. Candidates who give well-reasoned points, not in the marking schedule, are awarded marks for doing so.

**B. General comments on student performance in this diet of the examination**

- The standard of the answers to Paper 1 was similar to other sessions. Better candidates planned out their answers, particularly for the longer questions and were rewarded because there was less duplication in their answers and ensured they thought widely enough to score well.
- As per previous sessions answers to the application questions were mixed in that those that were structured scored well, whereas those that weren't had problems getting sufficient depth into their answer
- It was clear that the well thought out answers had planned them better, this is a good use of reading time.
- In this diet the scoring for the exam was done out of 200 and therefore the mark scheme shows a total of 200 marks available for the paper

**C. Pass Mark**

The Pass Mark for this exam was 59

## Solutions

**Q1** In general, credit risk is the risk of failure of third parties to repay debts. Credit risk here is that consumers will default - not be able to repay (loan as well as fee) on time. [2]

The normal criteria for lending (i.e. underwriting processes) are minimally applied because of internet sales and/or loans being small. Internet competition is likely to be fierce/will want to maximise sales/minimise acceptance process. Small loans will not support expenses of more extensive underwriting. For example, will now ask limited, or no, questions about borrower's character and ability/purpose of loan. Applications for loans will be open to fraud, including ID thefts.

And by definition the loan is unsecured. This final issue might not change the risk of default, but will lead to lower, or zero, amount being recovered by lender in the event of a borrower defaulting. [9]

Natural selection/anti selection will be occurring. The type of individual applying for the loan may not be acceptable for other forms of credit (e.g. bank overdraft) and therefore again be higher credit risk. Or the customer may simply be ready to default and is getting easy access to some money knowing that the loan is unsecured and that there will be little recourse available to the company. New customers may exhibit greater credit risk than repeat customers, due to no track record of repaying loans. Customers may be rolling-over previous loans into a new one. Possible lack of financial sophistication/awareness of customer e.g. has not thought through the affordability of the loan; has not assessed likely outgoings. Poorer economic conditions will increase credit risk, e.g. higher unemployment levels or less salary growth at a time when people will want these loans more. Or the regulatory regime works against the lender (specific e.g. – charge caps). [12]

Even though the loans are small, this will be from the provider's perspective. Individuals applying for these loans will be short of money by definition. So even a small change in circumstances could lead to default. For example, loss of salary by illness, loss of overtime. Or unexpected/emergency outgo arises. [5]

Workers employed over the internet may be especially risky. For example, such workers may be part of a large pool of possible workers that the employer could choose from. Their guaranteed level of income may be small. Although technically still employed, their default risk may be more akin to self-employed or zero hours contract type workers. [2]

In aggregate, the total amount of small loans will be large for the provider, and represent a high aggregate credit risk. [2]

Also, the fees are likely to be relatively high, to cope with likely high default risk, and the higher the fees are set, the higher the likelihood of default. [4]

[Total 36 available, Max 14]

*This question was answered reasonably well with most candidates scoring above half marks. Most candidates were able to draw out the underwriting limitations of internet sales. Not so many candidates discussed the wider points (that is answers didn't generally consider a range of ideas) such as aggregation of credit risk to the provider, and the consequences of potentially high fees.*

- Q2** (i) Market risks are the risks related to changes in investment market values or other features correlated with investment markets or economic indices such as interest and inflation rates. [3]

The risk can be divided into:

- The consequences of changes on asset values. [2]
- The consequence of investment market value changes on liabilities [2]
- The consequences of a provider not matching asset and liability cashflows. [2]

[9 available, Max 6]

- (ii) Liquidity risk is the risk that the company, although solvent, does not have sufficient financial resources available to enable it to meet its obligations as they fall due. [3]
- (iii) An insurance company may well have sufficient assets to cover its liabilities, but if those assets cannot be realised or realised for their expected value, then the company may not be able to satisfy its creditors, who can force it into liquidation, and possibly to cease trading. [3]

Liquidity risk in financial markets can exaggerate market risk with the market prices reflecting an imbalance between willing buyers and willing sellers. [2]

For example:

- An insurer may have a very large shareholding in a very profitable company and place a high value on the shareholding. However, if those profits are not distributed to shareholders or the shares are not easily traded in the market for that value this creates a liquidity risk in having cash to pay outgo. [3]
- During some stresses trading in investment markets may be suspended. The inability to trade assets, or to realise only at reduced prices, creates liquidity risk. [2]
- Markets may be illiquid or illiquid assets such as property are held. Collective investment funds, held by insurer, may be suspending redemptions. [3]
- Changing market conditions will expose liquidity problems if assets and liabilities are mismatched. [1]
- The insurer may suffer a reduction to premium income that was hitherto being used to meet claims/expenses. [2]
- Unexpected levels of new business strain may arise. [1]
- An insurer may have sudden/large/unexpected cash flows to provide, for example due to adverse claims experience or fines. Reinsurance recoveries may be delayed, or reinsurer may default. [3]

- The corporate/fund structure of an insurer may create liquidity problems due to inability to use assets from another area of the business (ringfencing/lack of fungibility). [2]  
[25 available, Max 10]  
[Total 34 available, Max 16]

- |   |
|---|
| <p>(i) <i>Was answered well by most candidates.</i></p> <p>(ii) <i>Most candidates gave a good account of the meaning of liquidity, but the examples of liquidity risk given sometimes too superficial and did not place enough emphasis on the “unexpected”.</i></p> |
|---|

**Q3** (i)

- Investors' perceptions of the characteristics of the asset class
  - risk
  - expected return
- external factors
  - Investors' incomes
    - institutional most important
    - private less important
    - overseas allowable investment may have increased
  - Investors' preferences
    - a change in their liabilities
    - a change in the regulatory or tax regimes
    - level of supply of an asset class
    - risk appetite
    - ethical concerns
    - uncertainty/changes in the political climate
    - "fashion" or sentiment altering
- sometimes for no discernible reason
  - marketing/investor awareness of asset class
  - level of understanding/education of asset class
  - e.g. investor may receive education undertaken by the suppliers of a particular asset class
  - emergence of new asset classes
  - emergence of new technologies to trade/research/monitor asset classes eg online
- price of alternative investments
- expenses of trading
- ease/speed/mode of trading

[24]

[24 available, Max 12]

- (ii) Simple approach likely to be adequate to protect consumers/ensure solvent providers. That is, provide enough market confidence / avoid stalling the emergence. The economy is just starting to emerge so rules are likely to be kept simple and quick to implement, but effective and fair across all parties. Especially as the regulator itself may be developing. The available asset classes are likely to be limited/simple, therefore easy for rigid rules to apply.

[7]

Non-prescriptive approaches require some level of judgment to be applied, which depends on availability of professionals with enough experience. There is likely to be less availability of experienced professionals as the economy just starting to develop.

[3]

Giving any more freedom initially may lead to market failures, possibly contagious. This would frustrate the government's likely aim for the economy to grow quickly.

[3]

The allowable assets may favour certain assets that enable the economy to grow faster e.g. infrastructure projects, government bonds. [2]  
[15 available, Max 4]

- (iii) Market prices will be affected by supply and demand. In this case, demand for allowed classes will be increased by the regulations and these will see an increase in prices (all other things being equal). However, the supply response will also govern how prices react eg government deciding to issue more/less bonds would reduce/increase prices. There may be pronounced price effects within asset classes eg a specific requirement to hold 15 year govt bonds would increase their price.

Similarly, disallowed classes will see a fall in prices. [8]

Likely major impact from regulations on institutions, because emerging economies less likely to have private investment cashflows of any materiality. [2]

Effect depends on how much cashflow is generated by each type of financial institution. [1]

Possible, however, that very few different asset classes are available anyway, and therefore that the regulations will have little impact initially (ie are more aligned to dealing with likely future growth). [2]

Effect also depends on restrictions (or otherwise) on investments from overseas. [1]

[14 available, Max 8]

[Total 53 available, Max 24]

- (i) *Was primarily a knowledge based question answered well by those candidates who knew it.*
- (ii) *Most candidates were able to describe what prescriptive valuations were, but without really being able to link this to the scenario being considered.*
- (iii) *Almost all candidates made the basic points, but only the better candidates were able to make the more subtle points to score well on the question.*

## Q4

- (i)
- Allowance for future changes in the following base assumptions
  - healthy to disabled rates / "sickness rates"
  - disabled to healthy rates / "recovery rates"
  - healthy to dead rates / "mortality rates"
  - disabled to dead rates
  - healthy to lapse rates/
    - "lapse rates"
  - future investment returns
  - benefit increases inflation
  - expenses
    - future expenses inflation
  - example expenses timing – initial/renewal/at claim inception/during claim
  - future tax rate
- [12]  
[12 available, Max 8]

- (ii) General points:
- Historical data is likely to be useful as a starting point
  - but assumptions need to reflect expected future experience
  - relevance of past data to future projections must also be balanced against the need for sufficient data for its analysis to be statistically credible -
  - this conflict must be managed
- [4]

Assumption specific:

- All transition rates except lapse rates:
    - standard tables (if available)
    - reinsurer data
    - Medical profession data, especially for disability rates / future changes in mortality or disability.
    - Otherwise industry or national stats but relevance becomes weaker;
  - allow for differences in target market/method of sale/stringency of underwriting/definition of disability (eg own occupation or any occupation)/changes to social and economic conditions
  - allow for any rate increases since table was produced, and into the future
    - Past data can also be used to project future changes
- [10]
- healthy to dead rates additional sources:
    - use own contracts' experience
  - allow for differences in target market/method of sale/stringency of underwriting
    - immediate annuities age range however will be retired people ie likely not refer to the younger ages which income protection would be available for
  - will need to try to derive future changes

- any younger age annuity mortality projections may help with reduction in rates but don't tend to look much at increases
- similarly whole life policy projections more concentrated just on increases in mortality
- reinsurer for advice on future changes [6]
- disabled to dead rates additional sources:
  - actuarial consultancy may provide some experience from large pension schemes' ill health retirements
    - need to adjust for relevance
      - especially occupation type[3]
- Healthy to lapse rates:
  - Only own office data likely to be available.
  - Unlikely to be relevant as contract is new/too different from existing lines
  - Anyway relevance of past data is questionable for expected lapse rates on this new line of business - heavily correlated with economic conditions[4]
- future investment returns
  - allow for expected return on likely backing assets
    - likely to be real assets
      - if index-linked bonds, term-based yield based on expected timing/duration of claims
      - if equity/property, past trend in dividends/rents for indication of future dividend growth[4]

When looking at future growth, need to allow for future economic outlook (may be changing). Use available economic/inflation forecasts as a guide, eg Policy statements by Governments or controlling banks/gap between current yields for fixed and index-linked bonds. [3]

- benefit increases inflation
  - need to be clear about inflation link eg RPI/CPI/salary related
    - Past data on inflation or salary levels in a particular country, industry or company may be useful when making an assumption about future levels of salary growth but need to allow for changing economic circumstances as above.
      - past data for real levels of prices and salaries may have fluctuated significantly less than the nominal data[5]
- expenses
  - use existing contracts' experience as far as possible
  - this should provide indication of policy set up, and renewal costs
  - allow for differences in expected business volumes
    - and any launch/system development costs needed for the new contract type
  - need to make special allowance for underwriting costs

- whole life assurance underwriting will be a starting point but illness is a wider contingency than death and more expensive to assess; salaries of specialist underwriters could be used
  - if any impaired life immediate annuities are written this would provide some data for at claim underwriting but no data for during claim u/w
  - advice from reinsurers likely to be necessary
  - or industry surveys on expenses
- [9]
- expenses inflation
    - likely mix of price and salary inflation as above but weighted towards insurance industry salaries specifically
- [1]
- future tax rate
    - use any available government/economic forecasts
- [1]  
[50 available, Max 24]  
[Total 62 available, Max 32]

*Candidates struggled with this question with few really getting to grips with the possible movements between the three main states. A simple triangular diagram was helpful here and those that drew this scored well. Some solutions lost focus by looking at the various different types of claim. Many ignored completely the economic assumptions or were too vague on these.*

*(ii) Some very good points were made by a number of candidates. However there was tendency to question the accuracy of data sources, which would be generic in any data situation, rather the relevance (perhaps with adjustment) of the different sources to the new policy. Generally the economic assumptions were handled too fleetingly with not sufficient detail given to score well on the question.*

- Q5** (i) Budgets available (for advice and implementation). Resources available, expertise, whether planning to outsource. [2]
- Attitude of employers different e.g. risk appetite/ paternalism / tolerance to staff turnover. [2]
- Profile of workforce. PXU may be more varied, Unicorn may be skewed towards younger. [3]
- Employee needs and expectations. [2]
- Location may drive difference in design (PXU in several locations, Unicorn only in 1). For example, there may be local applicable regulations, recruitment market conditions vary, costs of subsidising travel varies. [2]
- Benefits packages already in place – expect PXU to be more developed than Unicorn. [2]
- National legislative/statutory requirements e.g. company pension contributions if more than 10 employees. [2]
- Future company plans e.g. proposed redundancy exercise at PXU, expansion of Unicorn. [3]
- Other similar companies' benefit packages. [1]
- [19 available, Max 8]
- (i) Employees can select benefits appropriate to them (*or clear example that demonstrates this point*). [2]
- Benefit packages can change over time as personal circumstances change. [1]
- Allows them to select from a menu of different benefit options. [1]
- New benefits can be offered at little or no cost to the employer. [2]
- [6 available, Max 4]
- (ii) Risks – PXU Inc.
- Poor/low take-up. [1]
- High/increasing costs – up-front implementation and ongoing administration. [2]
- Risk of selecting 'bad' insurer e.g. insolvency, poor record-keeping, poor reputation. Insurer insolvency would mean PXU may have to meet death claims itself / large outgo. [3]
- Risks – PXU employees
- Worse/higher rates/terms than open market. [2]
- GGG doesn't pay up when needed. [2]
- Disputed/delayed claim. [1]

- Inadequate cover chosen without realising e.g. gone with the cheapest option. [2]  
 PXU doesn't pass on the premiums from employees. [1]  
 Inability to continue cover if employee leaves employment. [1]

Risks – GGG

- Insufficient/low quality data from PXU, so risk of mis-pricing the cover. [3]  
 Concentration / catastrophe risk e.g. catastrophe at PXU HQ, leading to multiple claims. [2]  
 Mortality risk. [2]  
 Underwriting / competition risk. Lapse / non-renewal risk. [2]  
 Anti-selection, due to non-compulsory take up / limited underwriting. [2]  
 [26 available, Max 12]

- (iii) How to measure performance and link to number of shares distributed (expand on possibilities, balance between individual performance vs company performance as a whole, no shares given if poor performance etc.) [4]  
 How to determine number of shares to allocate – maximum number/proportion. [3]  
 Joiners/leavers during the year e.g. leavers lose the right. [2]  
 Minimum employment time e.g. can only qualify after 2 years. [2]  
 Link to seniority e.g. more senior staff could qualify for more shares than junior staff. [1]  
 Option to buy shares in future, rather than get them straightaway. [2]  
 Administration – in-house vs outsource. [2]  
 Create new shares each year or 'move' from somewhere/someone else? Impact on share price, bearing in mind small company. [4]  
 Marketability of the shares. [1]  
 Employees may prefer the cash. [2]  
 Other example impacts:- effect on staff turnover levels or motivation (possible hostile atmosphere), need to implement confidentiality around share awards between employees, explain terms of award to staff and be able to answer staff questions on award. [5]

[28 available, Max 10]

[Total 74 available, Max 34]

- (i) *Answers to this question were mixed. Many candidates focused their answers on administrative savings/economies of scale for PXU, although this would have only secondary effect on benefits as in each case administration could be outsourced. Only the better candidates considered how the different sets of circumstances could directly drive the needs and desires of each employer and its employees. Some confined their answers to pension scheme benefits (DB v DC) and so restricted their marks.*
- (ii) *Was well answered, although few appreciated that new benefits could be added at no cost to the employer.*

- (iii) Most candidates picked up a good cross section of the available marks. However many thought that GGG was at risk from PXU failing to pass on premiums, whereas GGG would simply not provide cover in that scenario. Few considered the anti-selection risk for GGG.*
- (iv) Again, most candidates made good points but some wasted time by not confining their answers to the practical issues.*

- Q6**
- (i) To correct perceived market inefficiencies [1]  
To promote efficient and orderly markets [1]  
To protect consumers in the financial products [1]  
To maintain confidence in the financial system [1]  
To help reduce financial crime. [1]  
[5 available, Max 4]
- (ii) The areas of an insurance company's operations that may be regulated are:  
Products, for example to ensure that the product is ethical and in the interests of society to be available. [2]  
  
Nature of products, for example insurance company may be restricted to write only life or general insurance products. [2]  
  
Policy documents, for example to ensure the terms and conditions are fair. [2]  
  
Sales literature, for example to ensure that it is not misleading. [2]  
  
Product pricing, for example to ensure that the premium is neither inadequate for the risk, nor excessive, especially for compulsory insurance or limited competition. [3]  
  
Sales process, for example regulating sales agents, advice, disclosures, cooling off period, information asymmetry, charges and commissions, etc. [4]  
  
Underwriting process, for example to gender neutral pricing, no DNA testing. [3]  
  
Claims underwriting process, for example to ensure it is applied fairly for policyholder and insurance company. [2]  
  
Use of reinsurance, to ensure that there is a transfer of risk, manage counterparty risk, no arbitrage of regulations. [4]  
  
Reserving and capital, to ensure that adequate amount of reserves and capital are held for the risk. [3]  
  
Regulatory capital models and bases, to ensure that calculation of capital meets the required standard. [3]  
  
Quality and mix of capital to protect consumers and maintain confidence in the financial system. [3]  
  
Senior manager and certification, to reduce harm to consumers and strengthen market integrity. Individuals are accountable for their conduct and competence, e.g. how insurer conducts itself in general, how it deals with consumers, how it deals with its regulators. [4]

Meet required customer outcomes/TCF as required by regulator, particularly around areas where insurer has discretion e.g. bonuses, reviewable charges/premiums. [3]

Investments held to avoid excessive concentration, liquidity risks, mismatching etc. [3]

Insurance company systems and process to maintain confidence in the financial system and manage conflicts of interest e.g. Chinese walls. [3]

Data confidentiality / GDPR compliance. [2]

Change in insurance company control to ensure that shareholders meet minimum standards to maintain confidence in the financial system. [2]  
[50 available, Max 16]

(iii) **Legislation and regulation**

The regulators have to operate within the legislation and regulation. [1]

The regulators need to gather sufficient evidence to justify their actions, failure to do so risks legal challenges to decisions or actions. [2]

The regulators are dependent on the skills and experience of their staff, compared with size and complexity of insurance market. Regulations cost money. Ultimately need to work within the budget allocated by government, and balance benefits of regulations with their costs. Regulations will also need to allow for how well developed are the economy/financial markets, and how financially sophisticated are the consumers. [9]

Rules based regulations less need for regulator discretion, but may be very detailed and lengthy and time consuming. Principles based regs may involve regulator and/or companies in different interpretations of rules. Again could take extra time e.g. dealing with possible disputes. [2]

Whatever the regulatory approach, the soft and interpersonal skills of regulators are particularly important to the effectiveness. [2]

**Corporate governance.** [1]

The regulators are dependent on the skills and experience of people within insurance companies/supporting professionals. [1]

The efficiency and effectiveness of systems, processes, people and governance particularly when an insurance company is under stress and pressure. [3]

The accuracy and timeliness of information. [1]

The time taken to make decisions by both regulators and insurance companies to resolve issues. [1]

**Market environment.**

Market participants may be (at least one step) ahead of regulators – difficult for regulators to close all loopholes. [2]

May be too many companies to be able to apply same approach to each. Need to decide how best to prioritise e.g. risk based approach. [2]

Legislation changes, for example pensions freedom changes could overnight change the financial prospects for insurance companies. [2]

Operational risks, a catastrophic event can occur that moves a company from solvent to insolvent without providing any time for the regulator to intervene. [2]

Catastrophe insurance event, e.g. major weather event can occur that moves a company from solvent to insolvent without providing any time for the regulator to intervene.

The regulator will need to be agile enough to distinguish between real and technical insolvency issues. For example, a short term market downturn may need the regulator to be able to quickly change the regulations temporarily to avoid insurance companies needlessly taking any significant steps that would harm their long term prospects. [5]

Commercial requirements and competition – regulators need to balance actions they potentially would like to take against the impact it will have on competition and financial position of insurance companies. The approach taken by regulator will have to be careful not to undermine professionals involved in advising insurers e.g. reduce innovations which could reduce a regulator's concerns. Generous insolvency protection schemes may encourage recklessness. (*Nothing for just "moral hazard."*) [6]

International practice – if regulations and the actions of regulators are too oppressive insurance groups may re-domicile putting them out of reach of action. [2]

Political – pressures from governments or consumer groups to adopt particular approaches. Could be to ensure consistency e.g. similarity with how banks are regulated. [2]

**Consumer outcomes.**

A regulator may wish to control the risks to an insurance company. However this must be balanced by the impact on consumers. Relevant example of adverse consumer outcome e.g. restricted product range, prices too high, risk transferred to consumer from insurer. [3]

[49 available, Max 16]  
[Total 104 available, Max 36]

- (i) *Answered well by most candidates*
- (ii) *Most candidates scored well on this part although some wasted time by discussing all the possible types of asset restrictions and therefore missing easier marks available*
- (iii) *Was not answered quite so well. Some candidates merely added to or reinforced points already made in (ii). Those who simply listed the disadvantages of external regulation gained some marks, but limited themselves in thought. The better candidates thought of the different balancing acts needed and developed ideas accordingly.*

**Q7 (i) Interest only mortgage with an endowment assurance.**

The individual will receive a cash sum at the end of the term of the policy or on earlier death. [2]

Payments under the mortgage loan will generally only cover interest; capital outstanding remains constant (over the term). A separate premium is paid for the endowment policy – though they are usually, in practice, combined. [2]

In this way, funds from the endowment policy will be available to cover any outstanding capital on the mortgage when it is needed, on death or at end of term. [3]

This assumes that the sum assured/term of endowment is aligned to the amount borrowed/term under the mortgage. [1]

Often, the endowment is on a with-profit or unit linked basis, where sum assured on survival is reduced/discounted (by anticipating future bonuses/investment growth). This introduces the risk of failing to cover the capital due on the mortgage at end of term. But benefit on death usually non linked non profit i.e. guaranteed to cover full amount outstanding on the mortgage on death. [4]

Any changes in interest rate due will be stabilised/less geared than under interest only approach, due to presence of unchanging endowment premium. [1]

**Repayment Mortgage.**

Part of the payments under the mortgage loan will go towards repaying capital and part towards interest. That is, interest and capital repayments are combined. [2]

The capital outstanding under the mortgage decreases over the term of the policy [1]

The pure endowment part of the endowment assurance no longer exists under the repayment mortgage. The term assurance part no longer exists either. Need to consider what cover an individual needs on death within the mortgage term, and may need to take out a separate term assurance (level or decreasing). [3]

Any changes in interest rate due will be stabilised/less geared under this method than under interest only approach, due to declining capital outstanding. [1]

**Interest Only Mortgage.**

The individual only makes payments to cover the interest due under the mortgage loan. [1]

No life insurance policies are involved. The individual makes separate (or no) arrangements to cover the capital due under the mortgage on death or at the end of the term. [3]

This significantly increases the risk of a failure to repay the capital under the mortgage. [1]

Though an assumption of ever increasing house prices is used as a justification for allowing these arrangements. [1]

Any changes in interest rate due will be less stabilised/more geared under this method than under the other two approaches, because capital remains constant - assuming individual doesn't invest regularly to pay off the capital. [1]  
[marks available 27, maximum 12]

(ii) Differences from market value can be explained by comparing the arrangement in question to a direct investment in residential property. [2]

If insurer invested directly in a residential property:  
In return for paying full market value they could:

- obtain rental income until decide to sell
- obtain market value on subsequent sale
- retain option of when best to sell.

[4]

Under the arrangement in qn the following differences can be observed:

- no rental income
- lose option of when best to sell
- actually get restricted on when can sell ...
- ... have to wait until individual dies/ longevity risk.
- exposed to "loss of income" from rents in the meantime
- exposed to unknown house price inflation/deflation in the meantime.

Each of the above differences will therefore reduce the value of the investment from the insurer's point of view. [7]

Other issues will reduce the amount offered:

- expenses of offering and running these arrangements
- expenses of maintenance and upkeep of house
- profit margins
- less negotiating power of individual than on open market sale ...
- ... want money quickly / little bargaining power against insurer versus individual

[6]

Why considerably less?

All of the above aspects acquire greater value the longer the individual lives; potentially long time until death.

Even at ages in the 60's, homeowners may have a long time left to live. [3]

The insurer will reduce market price by more than best estimate values. It will include risk margins that exacerbate the reduction.

Risk margins even higher if relatively new product/ niche product / not much competition. [3]

[marks available 25, maximum 8]

- (iii) As explained in (ii) there is a longevity/mortality risk. Risk is that homeowner lives too long compared with assumption made when calculating the price they pay. *Give these marks if they appear at any point in (iii).* [3]  
Single person.

This addresses longevity risk. In that it reduces uncertainty and complexity over the mortality assumptions to be used. [2]

It also reduces the risk of bad publicity or legal action/costs if a spouse were to be evicted or lose their inheritance. [2]

Linked to this is the reduction of complications that could arise on remarriage, divorce or cohabitation. [1]

Also, this feature limits the term (no young spouse) with consequences as for the age 60 minimum. [1]

Homeowner.

Clearly, the provider will want to ensure that the property is the individuals to sell i.e. clear proof of ownership. [1]

Aged over 60.

This addresses the excess capital strain (reduction in investment flexibility) that would arise if funds were tied up in an illiquid, unmarketable, non-income producing asset for an inordinate length of time. [2]

Linked to this is a reduction in term to “maturity” and hence uncertainty or volatility in mortality and investment risks. [1]

There is a big investment risk on sustained higher than assumed interest rates. In that there would be a loss of potential return by paying “too much” to the homeowner. Likewise, return depends on house price inflation – if it is lower than assumed, “too much” will also be paid. *Again give 3 marks if at any point investment risk is explained.* [3]

Note, this feature doesn't directly address the mortality and investment risks ie they are still significant. But it does try to control the scope for excess uncertainty and hence risk premium required. [1]

No Debt Attaching.

This addresses the uncertainty and complications arising over the liability to clear the debt – does it exist? How much is it? Whose responsibility is it? [2]

Again there is the reputational risk associated with chasing elderly individuals for liabilities they didn't think that they had. [1]

The cash sum offered (average policy size) will be bigger in absence of any debt, so more profitable/less risky product for insurer. [2]

Cash Sum Now.

This addresses the uncertainty and potential bad publicity that would arise if there was a lack of clarity about what the individual were to receive and when they were to receive it. That is, easier for the provider to plan – no contingencies. [2]

Provider Responsible For Ownership Issues.

This will cover things like maintenance, insurance, taxes etc.

This addresses the uncertainty associated with who is responsible for what – and again potential reputational risk. [2]

It also gives the provider a lot more control and security e.g. less chance of a loss of value caused by the individual failing to maintain the property or default on bills (uninsured house burns down). [2]

Live Rent Free Until Death.

This addresses the reputational risk that would arise if an individual were to be evicted (fixed term occupancy) or fail to pay rent. [2]

Likewise, more certainty and control for the provider in terms of cashflows (no void risk) and terms and conditions that seem reasonable. [1]

Freedom to Act on Death.

Having this clearly set out e.g. no residual inheritance reduces the risks of claims or objections from relatives say – improves profit potential if no constraints or obligations. [2]

Note with many of the above features e.g. rent free, cash now say, a case could be made that by making features attractive to homeowners it increases chances of the product selling i.e. a risk of poor business volumes if features are not attractive or reasonable. *Give 2 marks if this case is made – but only once.* [2]

Likewise, many features are designed for simplicity and straightforwardness. This will reduce the risk of higher than expected expenses. *Give 2 marks if this case is made – but only once.* [2]

[marks available 37, maximum 14]

(iv) **Why anti-selection.**

Those in relatively good health will select the annuity rather than the cash sum. [1]

So not only will the provider have an “income loss”, in these selected cases, they will risk having to make overall higher payments, and for a lot longer than expected – so compounding the risks. [2]

It could be argued that under the basic product health won't be an issue – even though those in poor health will receive poor value, they will still take out the product since they may want cash (e.g. to pay care or medical costs) and have no other way of getting it as easily. [1]

If so, the downsides to the provider are large – wide range of health conditions under 1 pricing basis. [1]

Furthermore, those in very good health or those with lots of dependants (partners, children) will choose the ancillary benefits that favour them the most – high annuity increases if in very good health say. [2]

**Manage risk**

Discuss implies we want some rationale, justification as well as just describe.

Allow for selection in the pricing basis. [1]

In particular, assume lighter mortality for those who take the annuity and even lighter for long duration annuities. [2]

Regular review of pricing assumptions. [1]

Reinsurance of the longevity risk. [1]

Assume that in cases where homeowners select generous dependants' benefits, the worst case cost scenario arises – the standard basis may only assume benefits payable in a proportion of cases. [2]

Likewise, underwriting at inception (health questions) may help in that a range of annuity rates at each age could be used – hard to implement from a marketing perspective e.g. lower annuities for those in good health looks hard to justify and costly? [2]

Restrict the number and generosity of the options available. [1]

For example, limit the size of pension increases – certainly no uncapped inflation link - or the number of dependants to be covered. Give up to 2 marks for 2 valid examples 1 for increases 1 for death benefits. [2]

Similarly, a maximum term for the annuity could apply – 15 years say. [1]

Claims underwriting (control) would be important i.e. make sure annuities stop on death or that dependants exist. [2]

[21 available, Max 10]

[Total 111 available, Max 44]

- |   |
|---|
| <p>(i) <i>Was answered fairly well, most candidates having a good understanding of contrasting features of the different types of mortgages. Few candidates however considered the variability of the overall outlay in each case to fluctuations in interest rates.</i></p> <p>(ii) <i>Most candidates grasped the fundamental points, although better planning (i.e. starting from a default position of an open-market sale) could have generated more marks.</i></p> <p>(iii) <i>Only the best candidates considered the more subtle points and alluded to the overall picture of increased marketability (of some features) and ease of administration.</i></p> <p>(iv) <i>Was fairly well answered, most spotting and developing the obvious anti-selection risk.</i></p> |
|---|

## **END OF EXAMINERS' REPORT**