INSTITUTE AND FACULTY OF ACTUARIES

EXAMINERS' REPORT

September 2012 Examinations

Subject CA1 – Actuarial Risk Management

Paper Two

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.

D C Bowie
Chairman of the Board of Examiners

December 2012

General comments on Subject CA1

This subject examines applications in practical situation 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.

The examiners set questions that look for candidates to apply the principles specifically 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 nor is very detailed development of particular points.

Good candidates demonstrate that they have used the planning time well – an attempt to understand the breadth of the answer required combined with a logical flow 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. Time management is important so that candidates give answers to all questions that are roughly proportional to the number of marks available.

Comments on the September 2012 paper

The general performance was better than in April 2012. All questions except question 5 were reasonably well answered. For questions requiring application it is important to go beyond making generic points to score well. 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.

1 (i) Market
Credit
Business
Liquid
Operational
External

(ii) It is a tool for analysing a portfolio of risks by their risk characteristics. To split the risks into homogenous groups; where the risks within each group have similar features. This allows an appropriate price to be charged for the risk.

(iii) The first stage of risk classification in the design of a contract is an identification and documentation of the risk characteristics involved. To understand the level of risk within each contract.

For each risk it is necessary to decide for the contract those the provider is prepared to:

- take on and keep
- take on but lay off through the use of reinsurance or alternative risk transfers or underwriting
- refuse or eliminate unnecessary features

For those risks that are decided to be taken on and covered within the contract there is a decision required on the extent that the risk will be accepted.

Having decided on the risks to retain, the provider may change the product design to limit the risk in another way, for example restricting the risk by lowering cover levels, or tightening the circumstances when a claim can be made.

For the pricing of the contract it is necessary to translate the risk to risk factors that can be used to measure the frequency and severity of the risk so that the premium reflects the risk being taken on, i.e. that a fair premium is charged for each group.

Candidates scored very well on parts (i) and (ii), however, candidates struggled with part (iii). Part (iii) required candidates to relate the design of an insurance contact to restricting the extent that risks are accepted. Insurance companies structure the design, terms and conditions of a product so that they only accept the risks to the extent that they desire.

2 (i) The valuation method for the assets should be consistent to that used for the liabilities e.g. if the market value is taken for the assets then the liabilities should be calculated using a consistent rate.

The nature of the liabilities, heterogeneous benefits and scheme membership means that no "market value" is available i.e. there is not a liquid secondary market for trading existing pension scheme liabilities.

The purpose of the valuation is important. If it is to calculate the funding level e.g. for accounting or regulatory purposes or for a commercial transactions e.g. bulk transfers using market value is appropriate.

However, the market value is volatile in the short term which is an issue in setting a stable contribution level and may cause credibility problems.

If the scheme is a going concern the definition of market value used i.e. willing seller and willing buyer, should be consistent with the fact that the assets will not be immediately liquidated.

A misleading picture may be created, for example if the funding basis uses market values and funding levels are then quoted.

The main advantage is that the market value is readily available and also easily understood and communicated e.g. trustees. However there may be practical problems if no or multiple market values are available e.g. property or unquoted shares, no market value versus other assets which have more than one market value.

(ii) The smoothed market valuation will remove daily fluctuations but does not lend itself to consistent liability valuations.

Discounted cash flow allows consistency with the ongoing e.g. cash transaction liability calculation but requires more calculation and is hard to estimate future cashflows.

Neither may be an alternative if they are not permitted by local regulations.

Smoothed market values will not reflect drastic changes in the asset value i.e. if the company went nearly bankrupt and is subjective e.g. choice of assumptions and discount rates

(iii) **General market**

The whole economy is in recession.

There was a boom i.e. returns were very high for a period, rather than being particularly bad now.

There is currently a weak market and market values are low. This has been seen across all sectors.

The economic environment may have changed so all asset classes have lower absolute returns.

The growth in capital values has reduced and income streams are lower.

Due to the changing demographics there has been more demand for long term investments such as bonds. The type and/or term of investment has changed for example less equity demand due to lack of stability.

Poor political climate, uncertainty, riots, unemployment etc.

Unfavourable economic factors such as rising interest rates

Abundance of other investments, for example safer government bonds

Unstable inflation

New regulation due to banking crises so shift in investments

Tax and regulation with suitable examples e.g. removal of dividend tax credit?

Scheme Specific

A comparison of absolute returns achieved between different periods is not a good guide for how the investment manager has performed relative to their benchmark or peers. The investment managers may have had brief periods of underperformed in the prior 10 years, but out performed in the rest of the period,

The fund manager may have achieved higher returns by taking higher risk in the equity portfolio in the prior 10 years. Or the fund manager may have changed. Due to low funding levels the fund requires less volatile investments. To reduce the volatility the level of risk and therefore expected returns within the equity portfolio may have been reduced, for example lower beta equities, and sectors subject to less volatile returns, no unquoted equities.

The investment strategy has been changed for example from an active to a passive one i.e. tracking the market rather than taking risk for higher returns.

There have been regulatory changes. These have changed the way in which equities are valued. The new approach to valuing equities has reduced the returns compared to the previous valuation method (assumptions).

These changes have required that assets be disposed of and different ones purchased. This in itself incurs expenses but also may have been done at inopportune times. Possible crystallisation of capital gains tax due to changes in investment strategy.

All parts of this question were reasonably well answered.

3 (i) A provider (investor) should select investments that are appropriate to the nature, term and currency of the liabilities and the provider's (investor's) appetite for risk.

Subject to the above, the investments should also be selected to maximise the overall return on assets, where overall return includes both income and capital.

(ii) The initial starting point is the general commercial economic environment against which assets and liabilities are traded and valued.

i.e. The factors and conditions (such as economic, legal, political, and social circumstances) that generally affect everyone in an industry or market in more or less similar manner. Stakeholders should be considered, for example, trustees, employees etc and the impact on them. Specify the problem by having a clear objective for the long term asset liability portfolio.

The investor must be aware of what their investment objective is e.g. to match liabilities or to simply outperform a target. And also a clear identification of the risks that they are faced with.

This leads on to consideration of the assets available, including internationally and in relation to solvency/risk tolerances and whether any deviations are permitted.

In developing the solution consider the nature of the liabilities/target to match/outperform with the assets available to develop an asset liability model.

Devise a model using available tools e.g. individual expertise or software packages to select individual stocks, if active investment or indices to track if passive investment e.g. choose and update variables as and when changes occur e.g. returns, correlations, standard deviations, assets available.

At the same time must keep in mind the nature term and currency of the liabilities and/or risk tolerances/constraints of the institution.

Once built, test the model and feed back the results into the cycle with regular monitoring against the objective. The initial stage of this may involve back-testing the model against historical investment experience. There would also need to be regular on-going testing to react to changes in market conditions and expectations. Monitor and feed results back on an ongoing basis so that stakeholders are continually informed and can make decisions.

Are the assets still a match for the liabilities, that the indices are still appropriate and that the portfolio is still within risk tolerances so that the portfolio remains optimal.

This will involve monitoring solvency/funding levels and comparing managers against targets to ensure optimal performance achieved.

At all times act in a professional manner. This includes adhering to professional guidance, obeying Chinese walls and insider dealing rules, ethical/socially responsible investments and corporate responsibility.

(iii) **General**

The institutional investor will need to consider both the specific merits of the proposed investment and how this investment will fit within the overall portfolio. In particular the investor will need to consider whether to change the overall risk profile of the portfolio to accommodate the new investment, or if the overall risk profile is to be maintained whether a suitable rebalancing of the portfolio can be achieved to accommodate both the amount and nature of risk the new investment would generate.

Need to consider the current state of both the domestic and overseas economies i.e. recession, booms etc, and consider the needs of the investor, i.e. the returns required by the investor as well as diversification and restrictions.

If the domestic economy shows poor prospects compared to the overseas economy it may be viewed as an unsafe investment and, although possible lower returns, opportunities overseas maybe seen as safer investments.

Overseas may be better but likely more unstable inflation i.e. higher rewards often mean higher risks, including unstable investment markets and exchange rate risk, political risk, environmental risk.

Plus the issues of language barriers, tax, timing differences, accounting differences etc., all of which lead to extra expenses.

Diversification issues, manage domestic and overseas exposure.

Likelihood of economic growth in the domestic market is low.

Specific

Non performance of the lease. The overseas company could default on the shares. This is compounded by the overseas issues, i.e. higher gearing if there is too much debt and will not attract investors.

The residual value of the aircraft at the maturity of the term. This is not as volatile as share prices nor as subjective as property. In general there is a guide to the price of the aircraft at various ages, tweaked to allow for cosmetic and engineering issues.

This is a luxury goo, which is a cyclical market i.e. demand decreases in times of recession.

Mobility of the asset means that there could be no residual value i.e. there is the political risk that the owner could fly the aircraft to a political neutral country to avoid repayment.

Will need the help of specialists in valuing the asset.

Residual values and hence share values will depend on the maintenance of the aircraft, the upkeep depends on the quality of the operators i.e. record keeping, maintenance, rogue operators could devalue the value of the shares.

State of registration, the aircraft i.e. the asset need not necessarily have been registered locally hence more complications and susceptibility to political risks. There is susceptibility to local regulations.

Depends a lot on the terms of the leases if based on very lucrative terms could lead to large returns on the shares and provide a large amount of diversification.

The extra risks will be covered by the Equity Risk Premium otherwise the investor will not proceed with the investment, e.g. the company could default on shares if they are highly geared.

Overall this was the best answered question on the paper.

4 (i) **Financial**
NPV
IRR
(Discounted) payback period

Other
Achieving synergy/compatibility with other projects undertaken.
Satisfying political constraints both within and outside the sponsor.
Having sufficient upside potential or not too much downside.
Using scarce capital and resources (if available) in the best way.

(ii) Before developing a detailed plan or progressing to a feasibility study an initial high level assessment should be undertaken to consider whether the proposal warrants a more detailed analysis. The insurer would then be expected to commit a relatively small amount of capital to develop a feasibly study (including high level financial impacts), high level plan, a project budget proposal. It this is approved the project would be initiated.

Project plan, milestones and conflict management Clear aim and time line with appropriate pace set.

Model design. Design of a new pricing model or adaption of existing.

Knowledge. Insurer's experience of writing different classes of business, or more especially access to information on morbidity and mortality of animals.

Interaction with other professionals. For example vets, lawyers, general insurance actuaries, stable but challenging relationships. Specialist underwriting may be required including the help of vets, animal behaviourists. So excellent communication and supportive environment is needed , all parties need to buy in.

Systems – develop new admin systems or are current ones flexible enough to be adapted, given can use the existing policyholder data base the existing system with a few tweaks should be fine, providing the existing system has flexibility.

Thorough testing at all stages with use of the actuarial control cycle.

Spread of different risks within the portfolio – thorough risk analysis. Risks will vary according to species type.

Likelihood of epidemics and new diseases and also the evolution of technology.

Legalities – discrimination amongst animals! Use of DNA tests that are commonly available for animals.

Demand – thorough market research to ensure that there is demand for this type of product.

Sales channel. Consider vets waiting room, pet shops and also pet food section of supermarkets. But more importantly the existing policyholder database.

Volume and mix of business – again through market research. Will have to include extra prudence due to the extra uncertainty. Here it is not the change in mix of business as this is a new market.

Level of investment, required return and level of free assets.

Emotional behaviour. The sales director has an emotional interest in the project. The initial planning go ahead stage must involve all senior management and brainstorm the suggestion.

Costs information. Obtaining the additional information and adequate allowance for prudence.

The underwriting of animals and to what level of underwriting. Consideration of whether to offer one level of cover, probably best initially and then extend to different levels once sufficient data has been collected. Also consider exclusions e.g. dangerous dogs, working dogs, livestock.

Initial level of cover to be offered. A new model will need to be developed and appropriate skill set will be needed, as part of the model will need to

design different levels of cover say just medical fees for routine vaccinations through to repatriation if overseas.

Speed. Unlikely to have the same urgency as getting life insurance in place.

Popularity. Increasing due to increase in vets bills and pet owners and also this is a niche market so there are a lack of competitors.

Reinsurance. The use of reinsurers due to the technical assistance and also the additional uncertainty with a brand new product. Also XOL insurance due to potentially large liability claims.

There will be less data available compared to standard life insurance contracts, vets are a more modern concept than doctors and less animals registered with vets than doctor.

There may be less questions on the proposal form to encourage take up but possibly decline more proposals.

The insurance policy extends into general insurance if third party cover is offered e.g. dog running in roads and causing car crash or damage to property also different industries for example the search for lost or stolen animals.

The range of illnesses is greater. Range of breeds and animals compared to one race of humans. Likely to start with common domestic pets such as dogs and cats. Could be expanded to birds and rodents depending on initial success. This is a niche market so therefore can build more margins for prudence into the premium.

(iii) The life insurer needs to consider the cost of capital i.e. the cost of raising the capital to fund the project or the opportunity cost of capital for not investing in another project. Incremental cost of capital based on optimal debt to equity.

The normal cost of raising capital is the WACC, i.e. the reward for the shareholders or the cost of capital in real terms of borrowing debt capital.

That is, the margin over the total real return on index linked bonds, including an allowance for default risk and tax, and an additional allowance to compensate the equity investors for the extra risks and a possible inflation adjustment.

This is a large profitable life insurer and they are likely to have significant free reserves to use as capital, so in this case consider the expected return on long term equity investment.

There is likely to be a high discount rate set as this is a new project but this will lead to distorted results. Systematic risk will be higher due to the uniqueness of this project and this will be reflected in the risk discount rate.

Consider rates used on similar projects or even rates used by competitors, reinsurers or auditors may have produced benchmark surveys.

Although the NPV calculation is insensitive to small changes in the risk discount rate so it does not need to be precise.

This question was reasonably well answered. A number of weaker candidates struggled with part (ii) and (iii) by not concentrating on the this being a project and following the normal steps.

5 (i) The main aim of the new standards is likely to enhance the quality of actuarial reporting (consistency) to ensure that users of actuarial information can have confidence in the relevance, transparency of assumptions, completeness and comprehensibility of the information.

The new standards should also promote the integrity, competence and transparency of the actuarial professionals.

(ii) Work may depart from the requirements of the standards if the departure is considered not to be material.

In this context, something is material if, at the time the work is performed, the effect of the departure (or the combined effect if there is more than one departure) could influence the decisions to be taken by the users of the resulting actuarial information.

(iii) (a) Accruals: Expenses are recognised as and when they are incurred, regardless of whether or not the amount has been paid.

(b) Realisation: Income is recognised as and when it is "earned". It is not, therefore, necessary to wait until the customer settles his or her bill.

(c) Cost: Non-current assets generally appear in the statement of financial position at their original cost less depreciation to date, subject to a possible impairment write-down.

This convention ignores changes in the purchasing power of money and can produce different values for identical items but simplifies the task of maintaining bookkeeping records.

(d) Prudence: The preparers of the financial statements should avoid presenting an unduly optimistic set of results. Thus, the lowest *reasonable* figure should be stated for profit or for any of the assets. The highest *reasonable* figure should be stated for any liabilities.

However, it is not permitted to include deliberate margins in the financial statements by understating assets or revenues or by overstating expenses or liabilities. Prudence should only be applied in situations where there is uncertainty.

(e) Consistency: The figures published by the company should be comparable from one year to the next. Accounting policies should not, therefore, be changed from one year to the next unless there is a very good reason for doing so. Any changes should be highlighted and their impact explained.

(iv) Before attempting to interpret the accounts of a provider, it is necessary to be familiar with the rules governing the preparation of the accounts and also the accounting rules and conventions that apply in the countries concerned. There maybe different structures, items in different places, items lost in translation or a bias if there is more familiarity with one regime.

The accruals concept avoids the random allocation of costs to periods depending on whether a bill happens to have been paid or not.

Similarly, the realisation concept avoids the fluctuations in reported income which might arise if everything was accounted for on a cash basis.

For insurance companies there will be additional issues as premiums received will need to be considered over the whole term of the policies not only the accounting year in which they are received.

Reserves will need to be set up and this will affect how the profit on the business is reported.

There may also be issues due to liquidity problems not being recognised. The realisation concept can create the impression that a business is performing well when, in fact, it is in danger of running out of cash. A business which is expanding might report income long before the related cash inflows are received.

So any differences in applying the accruals and realisation concepts will make it difficult to compare the two companies.

Most investment type assets, i.e. securities, derivatives and (non owner occupied) property, are recorded at "fair value" (broadly market value) although redeemable fixed interest securities may be held at amortised cost in certain circumstances. Using the cost concept will give very different values and these values may be too high or too low but they will not be realisable.

If assets are shown at market value, consideration should be given to the vulnerability of the asset values to changes in market conditions.

The cost concept will exclude non-purchased intangible assets, such as the brand names and trademarks, on the grounds that there is no objective way to attach an initial value to them. These, however, may be of great value to a particular company.

Using prudence will means that there is very little danger of the figures lulling anybody into a false sense of security by overstating the company's strengths.

For example, using "fair values" rather than prudence will mean revaluing assets (and liabilities) in the statement of financial position at the end of each accounting period. Any loss on revaluation should be included in that period's income statement. Any gain on revaluation is taken to the revaluation reserve in the statement of financial position, where it is held until the gain is realised (i.e. the asset is sold). A consequence will be volatility in the financial statements

In practice it is often difficult to prepare the accounts for insurance companies in accordance with the consistency concept because of the uncertainty in determining the various items in the accounts, in particular the provisions. If the provisions established at the end of the year are weaker, in relation to current conditions, than those established at the end of the previous year, the profit for the year will have been overstated, and vice versa.

When comparing the accounts of the two companies, it will therefore be necessary to analyse the impact of any changes made. However, this could be time consuming and costly.

Insurance business is subject to cyclical effects that may affect many providers at more or less the same time. This makes it necessary to compare the profitability of a provider's business (as distinct from the profit disclosed by the latest set of accounts) with the results disclosed by the accounts of other providers, especially those transacting similar types of business. As these two companies carry out business in different countries they may be involved in different cycles, trading environments etc and so this may make comparison more difficult.

It is necessary that the differences in accounting concepts identified between the two countries can be clearly and concisely articulated to other users of the financial statements and when communicating results.

This question was not well answered. Parts (i) and (ii) of this question covered core reading of a new area of the syllabus. It is important that candidates understand the importance of the actuarial profession having actuarial standards. Parts (iii) and (iv) were also not answered well. Within accounting standards companies have some discretion on how they apply them so analysts always need to take care in comparing financial reports between companies and even of the same company over time. When different accounting standards apply, comparisons between companies are harder and an understanding of the differences in the accounting standards are required so that adjustments can be made to make comparisons on a like-for-like basis.

6 (i) Tax

The likely tax treatment of both benefits and contributions will depend on the policy objectives of the country and may vary over time according to risks including political.

The tax system is often used to both encourage and discourage certain behaviours.

Tax systems are used to redistribute wealth, therefore, there are often limits to tax concessions as part of the optimal use of the finite resources available.

Endowment assurance

In some regimes, tax relief may apply to contributions made to such savings vehicles.

This is more likely for products such as this that are long term.

However, given the nature of benefits (lump sums and surrender benefits), the authorities may be reluctant to give significant tax concessions.

Assuming that contributions are paid out of taxed income, benefits may well be tax-free.

It is less likely that tax concessions will be granted to investment returns on policyholders' funds.

Loan to buy property

Tax concessions are less likely for this vehicle than for the others.

Tax relief on loans to purchase property if they exist are likely to be limited to main residences rather than investment vehicles.

Likewise, it is likely that tax will be payable on sale proceeds at the end of the 30 year period.

However, rental income may receive favourable tax treatment e.g. if the authorities wished to boost private rented provision and/or reduce state provision.

Deferred annuities

As these arrangements are specifically set up to provide retirement benefits, it is possible that tax concessions will be more significant here than under the other two options.

In particular, tax relief on the single premiums is possible – assuming one contribution per tax year.

Also, investment proceeds on policyholders' funds may well receive tax concessions.

Given that contributions are likely to come out of untaxed income, tax may be payable on benefits received. However, allowances may be higher for pensioners (and marginal tax rates lower) and some concessions may apply e.g. if a limited part of pension is commuted for cash.

(ii) **Inflation protection**

Endowment assurance

The policy is with profit and hence bonuses may provide some inflation protection if held until the end of the term.

As the policy is long term, there may be significant exposure to real assets again implying an inflation link. But if the underlying assets are not real then may not keep pace with inflation.

This may be reflected in the philosophy applying to the split between reversionary and terminal bonuses or smoothing to reduce volatility.

However, premiums are likely to be fixed. Hence, if inflation were high, even allowing for bonuses, benefits may not be sufficient.

To maintain overall real values, the individual may need to increase premiums or take out additional policies.

Loan to buy property

The individual has direct exposure to a real asset and so this route should offer the best protection against unexpected inflation.

This is compounded by gearing since the loan used to buy the asset is fixed in nominal terms and so reduces in real terms as inflation rises.

But it would be expected that the loan repayments would increase if inflation rose.

However, the individuals earning and rental income may also broadly increase with inflation so keeping the loan serviceable. Regulation may limit inflationary exposure e.g. rental controls.

The price of a single house may be very volatile (e.g. depends on location) over 30 years and it may not correlate to other measures of inflation.

Given that rental income probably wouldn't cover loan repayments at least initially (loan requires repayment of capital), the individual is vulnerable to low inflation.

Deferred annuities

Benefits may be real or fixed in monetary terms. If fixed, in principle, most exposed to inflation compared to the other options. I.e. retirement inflation protection only if buy appropriate benefits.

However, inflationary expectations are factored into premium rates. Higher expected inflation implies high nominal returns pre retirement and favourable annuity factors. Hence the risk is higher unexpected inflation.

This is mitigated to a degree since new rates apply each year i.e. they will adjust to reflect up to date views of future inflation (also has a downside in terms of "losses" if inflationary expectations fall).

The new policy each year approach means that contributions can be adjusted upwards with inflation so maintaining real values of ultimate benefits.

(iii) **Expenses and admin**

Endowment assurance

As this is a one-off, stand alone policy expenses and admin complications should be relatively low compared to the other alternatives.

But, depending on the sales channel, commissions could be quite high.

The policy is with profit, which means that expense charges may not be transparent so leading to a risk of over-charging.

Likewise, expense charges could be relatively high if this line of business were being used to subsidise other lines where expense charges were more explicit. As well as extra administration practicalities if the policy is not on target

Loan to buy property

This approach is likely to give rise to the greatest expenses and admin complications. For example researching and time to find property as well as the specific costs related to buying property e.g. solicitors, stamp duty.

Taking out a loan will involve relatively high arrangement fees (e.g. underwriting) and management fees – they may be implicit in the interest rate and so again lack of clarity could imply over-charging.

Setting and collecting rent will be expensive. It will need detailed records (e.g. legal and taxation issues). The same applies to finding good tenants (e.g. costs of voids).

Upkeep and maintenance will be costly – especially since the property is let out. Supervision will be time consuming and messy.

To obtain benefits, it is likely that the house will need to be sold on retirement. Again this will incur high expenses and involve a lot of time and effort.

Deferred annuities

Single premium policies should in theory be less expensive to process e.g. commissions may be relatively low.

But this is an annuity policy hence these lower expenses may be offset by higher claims and maintenance expenses (term will be very long – hopefully).

Any savings due to the single premium nature may be lost since a new policy is taken out each year (assuming that initial expenses are significant).

This will also make admin more complicated as separate records will be needed for each policy and keeping track of total benefits may be tricky. It is also possible that terms and conditions will vary over time (e.g. in relation to guaranteed increases pre and post retirement – legal background could change) again making admin complicated.

(iv) **Death benefits**

Endowment assurance

This approach is likely to provide the most valuable and certain death benefits.

There will be a minimum cash sum, which may also attract bonuses, which should be relatively valuable whenever death occurs.

The relative importance of the death benefit will depend on the particular nature of the product.

For example, the individual may be able to opt for a policy with high death benefits or they may prefer one with a lower (say fixed no bonuses) death benefit with the emphasis being on the savings element.

Loan to buy property

The value of the benefits on death will be uncertain it depends on the market value property less the outstanding amount of loan at the time of death. This could be in theory be a valuable asset, however, this is not guaranteed and the value could be negative if the market value of the property has fallen since purchase.

If death occurred at a young age the outstanding loan will be higher so it is more likely the value is low or negative.

Where there is greatest risk that the value is negative the individual may be required to take out life assurance (decreasing term say) to provide for partial

or full repayment of the loan on death. If so, this could clear the loan and leave the full house value as an asset.

Deferred annuities

The policy will set out the benefits on death before retirement. The precise benefits will depend on the type of death benefits chosen as part of the policy.

The level of death benefits has a cost. For a given premium the higher the death benefits the lower the retirement benefits. Often the value of death benefits is low to maximise the retirement benefits for example return of the premium paid (plus interest). Hence the death benefit may be relatively small especially at young ages.

Legal and/or cost implications may mean that the provision of annuities on death before retirement is unlikely. Even if they were provided, they may not be equal to the expected annuity at retirement and so generous benefits are unlikely.

(v) **Early retirement provisions**

Endowment assurance

The maturity date is fixed, however, provided there is an option to surrender the policy prior to maturity early retirement benefits would be available.

This could be done at any time and so there would, in theory be a great deal of flexibility to retire early.

However, the benefits will be lower, especially if the surrender penalties are significant e.g. in respect of terminal bonuses. The value of surrender benefits will generally be lower the further from full term surrender occurs. A with-profit policy provides an investment guarantee at maturity. If investment returns on the with-profit fund have been low even close to full term the surrender benefits could be much lower than the maturity benefit. In practice this would reduce flexibility.

Some policies may have a flexible term e.g. no surrender penalties within five years of full term. But such options have a cost e.g. in terms of lower expected bonuses.

Loan to buy property

This option will offer the greatest theoretical flexibility to take benefits whenever they are desired.

The individual will need to pay the interest on the loan, however, they will have flexibility on how the excess income from the rent is used. For example whether it is used to repay capital or as income for the individual.

Alternatively, the individual could sell the property and repay the loan leaving a residual capital sum (net of any tax liability).

If the value of the house doesn't increase much or if capital on the loan isn't repaid quickly enough, in practice, the individual may not be able to retire early.

Also, there may be early repayment penalties on the loan and/or difficulties (e.g. as a result of legal risks) in selling with sitting tenants. Both will reduce actual flexibility.

Deferred annuities

This product will probably qualify as pensions business and so attract tax concessions.

This is a without profit policy so the options available, if any for early retirement will be know at outset. There is likely to be much less flexibility that under the other alternatives.

If there are early retirement options available then the basis for determining the early retirement benefits will be know in advance.

Even if the individual were able to retire early, large reduction factors may apply to the normal retirement pension. So again, flexibility is more apparent than practical.

It is possible that the policy includes benefits on ill health prior to retirement increasing the flexibility to retire early in certain circumstances (though more likely to apply to pension scheme benefits rather than deferred annuity contracts).

(vi) **Nature of benefits**

Endowment assurance

The benefit will be in the form of a cash sum, which gives great flexibility in terms of options available to the individual.

In particular, there will be no restrictions in terms of taking a large cash sum as opposed to converting benefits into an annuity.

However, if the individual did wish to take an annuity, this would depend on the annuity rates at retirement. If interest rates are low and/or life expectation higher than expected the individual is exposed to the level of income being lower than anticipated even if the cash sum was as expected.

The individual would not be forced to buy the annuity at maturity. He could delay buying an annuity until the market moved in their favour but there is a risk they do not move in his favour.

The individual would also have choice in terms of annuity provider and terms and conditions (e.g. spouse's benefits or pension increases), which would be attractive.

Loan to buy property

This option provides flexibility as it is an open ended investment.

There is the option to continue to rent the property and receive the rental income as a regular income net of expenses, i.e. rather like a pension. The amount of income available is likely to depend on market level of rents and the level of expenses involved in renting and maintaining the property and any outstanding loan amount.

Alternatively the property could be sold to provide a cash sum (net of any loan outstanding and tax liability). The individual has the flexibility on how the cash sum is used. The entire or some of the cash sum could be used to purchase an annuity, or used to purchase another property for renting out to tenants.

This will take time and there will be uncertainty over the price that could be achieved e.g. may need to lower sale price if they need cash benefits immediately.

If an annuity is purchased he will be able to choose the type of annuity purchased e.g. spouse's benefit and/or pension increased, and the annuity provider.

Deferred annuities

The retirement benefits including any options will be set out in the contract, as such the benefits available will be restricted.

The benefit here will be in the form of a guaranteed pension for life, which will protect the individual against longevity risk and against poor annuity rates at retirement.

The individual may be able to exchange some pension for cash but the amount may be restricted and conversion terms may not be generous or guaranteed.

The terms of payment e.g. spouse's benefits or guaranteed increases may have been fixed when the policy was taken out – hence they may not now be suitable e.g. was married now single etc.

It is possible that the individual may be able to change these terms but again options will have a cost.

All parts of this question were reasonably well answered.

END OF EXAMINERS' REPORT