Faculty of Actuaries **Institute of Actuaries**

EXAMINATIONS

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Paper Two

EXAMINERS' REPORT

1 (i) Term assurance premiums are easy to compare for different companies. The capability to do this has increased since more intermediaries have access to the internet. The most likely reason is therefore that the company's premium rates have become uncompetitive. This might have happened due to other companies:

- accepting lower profit margins or selling at a loss to gain market share;
- may have negotiated favourable terms with reinsurers;
- having lower expenses;
- having better critical illness claims' experience which is reflected in their pricing;
- increasing the number of critical illnesses covered under their policies, or made their critical illness definitions more attractive.
- reducing the number of critical illnesses covered under their policies, making the product cheaper (this would be beneficial if the cost of the diseases excluded exceeded the perceived value of the benefit of having them covered);
- reinsurers may have increased their rates, causing an increase in the actual premium rates.

Initial commission may be lower than that paid by other companies or may not meet the needs of the intermediaries.

The company may have gained a bad reputation over whether or not it pays contentious critical illness claims; whether a claim meets the required definition is not always obvious.

There may have been servicing delays over the setting up of policies and collection of premiums which would not have been popular with policyholders or intermediaries so may have impacted on new business volumes, or delays over claim payments.

There may have been delays over the payment of commission to intermediaries which would have made them less likely to place future new business with the company.

The company may have developed a reputation for unpopular underwriting decisions, i.e. rating people when other companies don't, or the sum assured at which medicals are requested may be lower than other companies.

The proposal forms may be difficult to follow and time consuming to complete.

There may be concerns about the financial strength of the company and hence the potential inability to pay future claims.

Other companies may have introduced attractive options such as guaranteed insurability on certain events or reviewable rates. The company may have been concentrating on the marketing of other product lines, or other companies may give more sales support to intermediaries.

The company may have received bad publicity about some other area of business which would impact on term assurance new business volumes.

There may have been a general reduction in new business volumes throughout the marketplace. For example, this might be caused by most of the potential market now having cover, or by a recession. A competitor may be running a marketing campaign

New sales regulations may have made the product more difficult to sell, or other forms of critical illness may have become more popular (e.g. unit-linked). Or, there might have been a deliberate decision by the company to restrict new business, to reduce new business strain or limit exposure to CI experience

There might have been adverse changes to the tax treatment of the policyholders or the life office

In general this question was fairly well answered, although candidates tended to focus on company specifics rather than considering the possible reasons for a general contraction in the market.

(ii) (a) If this option is popular with intermediaries then it is likely to increase new business volumes, although if commission levels are too low then this change in itself is unlikely to make much difference..

The impact on the profitability of the product will depend on the exact commission terms offered. If these are set so as to leave the profit of the product independent of the commission option chosen then the new option will tend to make the company more exposed to lapses at early durations (since the initial commission expressed as a % of premiums during the initial commission period will be greater). However, intermediaries are unlikely to choose this option if they expect the policy to have good persistency as they will receive less initial commission.

The persistency of the business with a reduced initial commission period is therefore likely to be worse than for that on standard initial commission period.This will result in reduced profits due to the high levels of initial expenses and commission. This is particularly true if intermediaries can select the initial commission basis on a policy by policy basis since they will be able to judge the potential persistency of each individual case before deciding on the basis.

This problem could be reduced if intermediaries had to choose one or other commission option for all of their business.Or, alternatively, the option could only be offered to intermediaries with good persistency experience, but they are less likely to value the option and their future persistency may be worse than in the past.

If the option was offered, the company would want to ensure that its systems could administer the payment and clawback properly. It would also need a system in place to monitor persistency by intermediary so that it could remove the option from intermediaries with poor persistency as soon as possible.

Companies are particularly exposed to lapses at early durations for term assurance if premium rates in the marketplace are falling since a policy can be lapsed and a new one effected for a lower premium even if the age has increased. Recently, in the UK, the premium rates on critical illness policies have been increasing, reducing this risk. Thus, the intermediary is giving good advice when advising a policyholder to lapse and effect a new policy and will receive more initial commission to reflect this

The level of initial commission on the reduced initial commission period could be set so that the profit was the same as for a case on the standard basis taking account of the higher lapse rates.But there is no data on which to base the assumption for higher lapse rates making it more likely that the actual experience will differ from the assumptions. Sensitivity testing on the impact of different lapse assumptions should therefore be carried out.

If the assumption is too prudent then the option will not appear attractive to intermediaries and there is less likely to be an increase in new business volumes.

Lapse and re-entry is only likely to be done by those in good health as they will have to undergo new underwriting so the critical illness claims' experience of the portfolio is also likely to worsen.

The proposed structure would reduce new business strain.

Although most candidates identified that there was a lapse risk, fewer candidates considered the selection risk, and the possible ways in which it could be reduced, in any depth.

(b) Reducing the expense assumption will enable the premium to be reduced thus increasing new business volumes as long as the reduced premium looks competitive.

However, overheads such as management, computer systems etc have to be covered by the product range as a whole.

It might be possible to cover all the overheads in the pricing of the other products.

The aim of the company will be to maximise the profit whilst ensuring that its overheads are covered by the whole product range.

If other products are less price sensitive than term assurance then the impact on new business volumes of loading additional overheads into them may be less than for term assurance.

If so, then the increased term assurance new business may result in higher overall profits with the total overheads being covered by the whole product range

Before doing this, however, the company will need to carefully consider the potential impact on the sales volumes of other products.

It is not always possible to separate overheads and direct expenses exactly so there is a risk that the estimate of direct costs is incorrect.

The office needs to check that it has sufficient free assets to cope with the new business strain from an increase in volume. It will also need to consider whether a significant change in the mix of new business will result in a strain on the solvency position since different products will generate different new business strains.

If the change is expected to generate a significant increase in volume, it would also need to check whether the new business areas can cope with the additional term assurance volumes. This might impact on the quality of the underwriting.

If it adopts this approach, then the company will now be exposed to changes in the mix of business as well as to changes in the volume i.e. both aspects will impact on whether total overheads are covered by the product range as a whole.

The office could choose to reduce the overheads loaded into the term assurance expenses per policy (rather than excluding them completely) and hope that the extra volume of sales results in an increase in the total overheads covered by term assurances as a whole (i.e. volume * overheads per policy increases)

If premiums reduce significantly then there might be a lapse and re-entry problem

The impact of the proposal on the portfolio as a whole will depend on how large a proportion of the total portfolio is made up of this product

Most candidates identified the fact that overheads could be loaded on to other products, but this implications and further considerations were not fully developed. For example, there was little consideration of whether other products were price sensitive and the impact on the sensitivity of overall profit to mix of business.

(c) With reviewable premiums the company would not be exposed to the risk that future experience was worse than expected. For guaranteed rates it will either have costed the guarantee directly or used prudent critical illness assumptions when setting the premiums. It will be able to remove this charge or margin from the premiums for reviewable rates. It would therefore be able to charge lower premiums for reviewable rates

However, potential policyholders may not like the potential for future increases in premiums. Whether or not the availability of reviewable rates would improve new business volumes would depend on whether the reduction in premiums appeared more attractive than the value placed on having guaranteed rates. The relative attractiveness of the cost of reviewable and guaranteed rates will partly depend on whether people think that future premiums are likely to rise or fall

If other companies offer reviewable rates then these rates may be more accepted in the marketplace. It would also give an indication of whether there was a genuine demand for such a product. If no other companies offered the product, then the company would need to undertake some market research to determine whether there might be a demand.

The company would also need to consider whether the business sold on reviewable rates would simply replace that which it would have otherwise sold on guaranteed rates. If so, then it would not be worth developing the new option unless greater profit could be made on reviewable rates.

The company would need to consider whether it had the systems capability to actually change the premiums in light of bad experience.

This proposal is likely to involve development expense which would have to be justified by potential increases in business volumes. The reviews themselves will also lead to an increase in expenses

It also needs to consider potential bad publicity from future increases in premiums and be sure that it would actually carry out these increases in practice (if required). If it would not, then the rates are not really reviewable.

It would need to make sure that marketing material and policy conditions clearly sets out the potential for increases in premium and what would cause these so that policyholders expectations were framed appropriately.For example, it would need to be clear about how much of a change in experience would generate a change in premium. The company needs to decide on how frequently it will carry out reviews. Also, in order to sell, it may need to guarantee a period at the start of the policy during which it would not change the premiums. It would need to consider whether it would also reduce premiums in light of good experience, set this out clearly, and be prepared to do it in practice.

It needs to make sure that it monitors experience appropriately in order to identify changes in experience as soon as possible.Even then, there will still be a time lag between identifying bad experience and actually changing premiums so the premiums will be guaranteed to a limited degree. This guarantee would have to be priced into the rates.

If significant increases are required in the future then some policies will lapse which otherwise would not have. Thus, persistency experience would tend to be worse than for guaranteed premiums leading to lower profits.Also, the policies which lapsed would tend to be those in better health so the critical illness claims' experience of the remaining policies would worsen further, requiring further increases in premium.

There might also be a lapse and re-entry issue for existing policyholders on guaranteed rates if they perceive the new reviewable rates as being better value.

Reviewable rates may be less capital intensive i.e. lower margins in reserves and solvency margin.

The company may need to make this change in order to be able to reinsure the business

This question was answered reasonably well.

(d) If attractive to potential policyholders, then this could increase sales since maintenance of real cover will help meet policyholder needs, although it is unlikely to be sufficient in itself.

Each year's increase is at the policyholder's discretion. The policyholder is more likely to increase their premium if they are in bad health. This anti-selection risk is likely to lead to poorer experience.

The risk could be reduced by making policyholders choose at outset whether they want an automatic increase each year. Or the company could prohibit any increase if one was not taken in the previous year. Or the company could offer a larger one-off increase in the event of lifestyle changing events such as parenthood or marriage

If inflation is high then the financial impact of anti-selection would be greater. So the company could limit the increase to the lower of inflation and x%.

The company would have to allow for the potentially worse experience when setting the premium rates.

In theory, the cost of critical illness cover will increase with age so if the sum assured increases in line with inflation then, all other things being equal, the premium should increase by more than the sum assured. To allow for the fact that the premiums increase at the same rate, the premium at outset would have to be higher than for a policy without this option.

To do this, the company would have to make an assumption about how many increases will be effected by each policyholder. This will be difficult to predict making it more likely that actual experience will differ from that assumed. If the assumption is too prudent then the policies will not sell but a best estimate assumption brings about a relatively high probability of losses due to more increases being effected than expected. The company would also need to assume a rate of price inflation (consistent with other financial assumptions) when setting the premium.

Expenses will also be incurred at each indexation which would need to be allowed for in the premiums. The company might introduce a minimum % increase to ensure that expenses are covered. The company will also need to consider whether initial commission would be paid on each increase option.

The company will want to adapt its systems to ensure that the process for taking out an increase is as automated as possible.

The indexation option may afford the company an opportunity to communicate with the customer and possibly cross-sell

The company will need to decide what to do for policies which were originally rated.

The anti-selection issues mean that underwriting may need to be tighter (i.e. lower medical limits) ; this may deter sales.

The options will have to be reserved for appropriately ; this may increase new business strain

Most candidates identified the selection risk although fewer considered ways in which this could be reduced.

(e) A risk discount rate is based on the return the company requires on risk free assets increased to reflect the additional risk that profits might not emerge as expected from the contracts. Thus, if there is more uncertainty about future cashflows differing from those assumed, the risk discount rate should be higher

A lower risk discount rate will increase the present value of profits.So the proposed reduction in risk discount rate will allow premiums to be reduced whilst meeting the company's profit targets which should lead to higher new business.

However, the company needs to remember that although profits are apparently greater, the return on capital is less (since the premiums are lower) and decide whether it is comfortable with this.

If the risk discount rate has not been changed for a while then the economic conditions and return available on risk free assets may be different from that underlying the current risk discount rate. If the risk free return was now lower, it would justify a lower risk discount rate.If this risk free return was not lower then a change in risk discount rate would be less justified.

Any justified change in risk discount rates would apply to other products as well as term assurance.Any difference in risk discount rate between products should reflect differences in the risk relating to these products. Reducing the risk discount rate for term assurance in isolation would lead to inconsistent comparisons of the profit from different products. This in turn might lead the company to invest capital in writing term assurance when the returns available would be higher if it was invested in other products.

If the risk discount rate used when pricing the term assurances is changed, but that used when calculating the embedded value of the in-force is not, then the apparently greater profits when setting premium rates will not come through to the embedded value of the in-force. The company may therefore find that the term assurance business it is writing is not generating any profits in the Report & Accounts (if embedded value is shown in this)

If premiums are uncompetitive it may be an indication that other companies are using a lower risk discount rate.It may be possible to get an indication of this from consultants or industry surveys.If this turns out to be the case then the company may need to decide whether it is willing to accept a lower return on its capital or whether it will accept lower volumes of term assurance business than in the past.

This question was relatively poorly answered. Although most candidates identified that the risk discount rate should not be changed without justification, few considered the interaction with other products, the possible implications of inconsistencies, and what might justify a change in rate.

2 (i) The company will be looking to build a detailed financial model to:

- Project the initial (and subsequent) injections of capital required to launch the new operation.
- Determine the payback period over which the initial capital injections will be returned.
- The likely profit stream from the venture.
- And hence enable the company to make a sound decision regarding whether it should proceed with the venture.

To do this the company will need to do a series of investigations, to enable it to build each of the elements of the financial model with some degree of confidence.

Market

Firstly the company will need to assess the extent of the market opportunity likely to be presented by the overseas operation.A detailed assessment of the whole market in the overseas territory will have to be carried out. In particular market segmentation by, for example, location, annual income, propensity to purchase life insurance products and so on will be carried out.

The company will need to make some early assumptions regarding the types of contracts it may wish to launch, the target market it wants to aim for and it's geographical location. Since the market is under-developed, simple products may be preferable. In considering the products to sell, the company will want to take into account the demographics of the country i.e. are there significant risks relating to particular diseases, is the population ageing etc.

The company will need to determine whether markets exist for unit-linked, without-profits, with-profits, or a combination of these. It will also need to assess the extent to which these products differ from those to which it is used to and the extent to which it has the knowledge to fully understand the differences. For unit-linked products past performance will be important ; the company does not have this and will have to consider how to solve this problem. For with-profits products, it will have to understand the degree to which PRE is important and how it differs from the UK.

These assumptions on products can be amended through an iterative process (for example, if the market segmentation work shows that the market for particular products or income groups is likely to be too small then the company will revisit it's early assumptions about the type of products it wishes to sell and will redo its cashflow projections on a new basis). This will allow the company to derive the size of the market for the products it wants to launch in its chosen target markets.

In doing this it may identify that there are particular product markets that are not well catered for, or conversely where the competition is fierce, which will help the company to hone its views on the products it may wish to launch.The company will then need to do a detailed assessment of the competition that exists for each product type and in each market segment.

The company will need to assess the extent to which customers are loyal to brands and the extent to which they are willing to purchase from a provider whose parent company is from overseas. If there is significant brand loyalty, then it may be very difficult to persuade the consumers in the target market to purchase the new company's products. This may lead to either slower growth in the early years of the operation or a need for significant spend on advertising and marketing the products in the early years of the operation to build brand awareness. To reduce these problems, the company may link up with a local partner as part of a joint venture.Both growth rates and advertising spend are assumptions required for the cashflow model.

The company will also investigate the success of other overseas companies that have set up an operation in the territory concerned, to see if there are any obvious lessons that can be learned (e.g. regarding product mix or distribution strategy).

Regulatory Environment

The company will want to consider very early on in this process the regulatory environment in which the new company will operate.In particular, it will need to assess whether there are any significant barriers to entry.

These may take the form of:

- the need to hold high amounts of start up capital,
- particularly stringent reserving requirements (which may make some contracts particularly unattractive to launch),

- barriers on the movement of currency in and out of the country in question or exchange controls,
- the requirement for foreign companies to have a local partner who holds a particular percentage of the equity in the new company. This may be a significant barrier if a suitable partner cannot be found.
- restrictions on the product types which can be sold
- restrictions on the assets in which it is permissible to invest
- requirements for the involvement of locals in management
- restrictions on the distribution channels allowed (i.e. no direct sales)
- restrictions on underwriting e.g. genetic tests and use of family histories

The company will have to be sure at this stage that none of these barriers form a serious risk, or if they do, it will have to have a clear plan to mitigate these risks.

The company is also likely to schedule a meeting (or a series of meetings at this point with the overseas regulator to indicate its interest in setting up an operation there. This will enable the company to establish whether there are any further barriers that it has not yet identified. If there are particular requirements (such as the need to hold an initial amount of seed capital), this will need to be taken into account in the cashflow model.

The company will also need to consider the extent to which the regulations differ from the UK — and hence the extent to which it will need to hire personnel in the overseas market, with an understanding for the regulations, and the availability of such personnel in the overseas market. The cost of employing overseas personnel may be relatively expensive if they are in short supply.

Distribution Channel

Having done the preliminary analysis of the market and the types of products the company would like to offer, the company will need to consider the distribution channel(s) through which it intends to distribute these products. The company is likely to have the choice of linking up with another provider who has the distribution capability (e.g. forming a partnership with an established bank that has a branch network) or establishing its own distribution capability.

It may plan establish it's own capability either through direct marketing (e.g. by purchasing databases and doing mail shots or by advertising in newspapers) or by establishing its own salesforce.

The difficulties associated with setting up its own sale force would need to be considered. In particular the company will need to consider:

- who will manage the sales force locally,

- the training it will need to put into place for the sales force (taking into account any regulator requirements re the minimum training, for example, a salesperson may have to receive),
- how it will hire the sales force and
- the extent to which the sales force need a branch network (leasing and management of branch premises etc.)

The distribution channel is likely to impact on the persistency experience of the business

Personnel/Expertise

The company will need to consider the extent to which expertise is available in the local market to set up a new insurance company. In an under-developed market, it's unlikely that all of the expertise that the company will require to set up the new operation will be available in the overseas territory. The company is likely to need a mixture of personnel from the UK and the overseas territory to set up the new operation. The costs of using UK staff in an under-developed market is likely to be expensive due to the need to pay relocation expenses and higher salaries.

Computer Systems

The company will need to consider the systems it will need for the new operation. In particular it will need to consider the administration system on which all policy data will be kept and the actuarial software that will be used to do the financial projections or to value the policies.

It may be that the company can buy an "off-the-shelf" package available in the overseas territoryor it may want to use similar software to that used in the UK, for ease of amalgamating results, if this is possible.

The capital costs of any software to be purchased will need to be taken into account in the cashflow model (including the cost of testing this software). In addition, the software chosen is likely to influence the per policy costs of administering policies, which will need to be taken into account in the expense model and in the pricing of the new products.

Expense Model & Volumes of Business

Using all of the investigations above, the company is likely to develop an expense model that will capture all of the expenses associated with setting up the new operation. To derive the expenses, assumptions will be made regarding the volumes of business likely to be secured and the timing of the launch of each contract type, as well as assumptions regarding distribution and administration costs discussed above.

Economic and other assumptions

The company will need to determine all of the economic assumptions required for the cashflow model, in particular regarding investment returns, inflation of expenses and salaries, the risk discount rate to be used and so on. It will consider the economic climate in the overseas territory (i.e. the volatility of inflation, interest rates etc and the stage of the economic cycle) which in turn will feed into the assumptions regarding the growth of the target market and annual incomes, and other assumptions such as withdrawal rates.

The company will need to determine the required rate of return for investing in this territory. Due to the significant risks of setting up a new operation, it's likely that the company will demand a significantly higher return on the capital invested than it demands in the UK. The company will determine the risk premium required, which in turn will determine the risk discount rate to be used in the cashflow model.

The company will need to consider the assets available in the overseas territory, and the investment returns that can expected to be earned on each asset class. It will also need to take into account the investment returns available on other instruments in the overseas territory (e.g. for the products to be attractive they may need to offer rates of return greater than can be earned on bank deposits or by investing directly in mutual funds). This may help the company to determine the asset mix it needs to hold to support the rates of return it wishes to provide to policyholders.

Where an under-developed insurance market exists, there may also shortages of asset classes that are widely available in the UK (e.g. long dated gilts). This will impact on the company's ability to match long term liabilities and increases the reinvestment risk significantly. Again this will influence the asset mix that will be held.

Taxation will also need to be considered; for example, will additional tax need to be paid on profits brought back into the UK.

The company will need to decide on appropriate mortality and persistency data for the territory — possibly based on experience in other similar markets if local data is not available

There will be risks relating to currency volatility which will impact on the return on capital i.e. the return in local terms may not be the same as in UK currency. The company needs to consider how to minimise these.

The company needs to consider whether reinsurers exist who can accept some of the risk.

` The company needs to consider whether there are political risks such as a change in government which could impact on its potential business.

The company needs to consider whether there are any language barriers to overcome.

The company will put all of the assumptions together to produce the estimated cashflows for the new operation, which in turn will demonstrate the capital required to set up the new venture. Having derived this figure, the company will have to consider alternative uses for the capital to assess whether the venture is the best option available for using the capital — to check that long term profit streams have been maximised.

This question was relatively well answered.

(ii) **Consequences of Not Entering Market and Impact on Standard Annuities**

Impaired life annuities are still a very small part of the pension annuity market, but more and more companies are entering the market. As the market for impaired annuities grows, the life expectancy of those not effecting impaired life annuities will increase as the impaired lives are removed from the population.

There is a risk in being the last company offering aggregate rates, as you will attract all the healthy lives on aggregate mortality. If rates for impaired lives are improved then rates for healthy lives must be worsened. A greater proportion of the population is healthy rather than impaired, so terms will be worsened for the majority. This is the opposite of the position when smoker/non-smoker rates were introduced for assurances. The majority, who are non-smokers, could get better rates.

At present there remains considerable lethargy in taking annuities at vesting, with a large proportion only considering options available for the company they were insured with in deferment. The regulators are trying to address this by requiring additional disclosure when vesting quotations are provided. Thus a company with a large volume of its own business could lose more of its own healthy lives to competitors offering aggregate rates than it attracts impaired lives from other companies. So it is not clear that the proposal will increase business volumes.

Drawdown

The most seriously impaired (terminally ill) policyholders who have dependents are likely to prefer an income drawdown contract to a conventional annuity. They will not need their entire fund to live on, however generous the annuity rate, and will prefer to leave the balance of the fund as part of their estate in the drawdown policy.

Underwriting approach

The underwriting approach is crucial to the success of this venture. Most policyholders need their pension to start promptly and so the process must arrive at a decision speedily. A points-scoring approach for the more common conditions could give an indication of the annuity rate that could be offered. Full underwriting for more difficult conditions or larger policy sizes could back this up.

The company's underwriters are likely to be experienced in mortality and morbidity underwriting for much younger lives than those at retirement. Longevity underwriting at older ages involves a different area of medical knowledge. The underwriters will need training.

As the aim is not to discover conditions that the insured does not know about but is to determine the severity of known conditions, medical examinations are unlikely to yield much useful data except for the largest policies. Much more weight is attached to GP reports and to specialist reports that the GP can provide.

It is in the policyholder's interest to ensure that as full information as possible is provided, so non-disclosure is not an issue.

Traditionally age, sex and, more recently, smoker status have been the drivers of mortality rates for life assurance. These may not be the most appropriate features for impaired lives mortality. Socio-economic group (policy size is a good proxy for this) may be important for the progress of some ailments. For certain cancers it is clear that duration from diagnosis is a much more important factor than age.

Mortality data

The company cannot write the business without some mortality data to use to price the business. It is important that the mortality data matches the underwriting approach.The business is very new in the market, so there is very little UK annuitant data to use. Even that which there is relates to mortality within relatively few years from commencement and the point at which underwriting occurred. Companies who have data of their own regard it as valuable intellectual property.

A detailed analysis of medical statistics could be carried out, but this would be expensive, time consuming and difficult to relate to the underwriting process. So the only practical way of writing business is to reinsure a considerable proportion of it, and to use the reinsurer's rates. This means that mortality profits will largely pass to the reinsurer. There will still be scope to make a margin on the investments and the expenses. Longer term, if a sufficient volume of data is collected to make the experience credible, the company could reduce its reliance on reinsurers.

The company could compare its rates with other companies. However, this is made more difficult by the fact that the definitions of impairment may vary between companies

Mortality improvements

It is not obvious that improvements in aggregate annuitant mortality will apply to impaired life annuitants. For example part of the aggregate mortality improvement is due to people giving up smoking. This feature appears in neither the smoker nor the non-smoker mortality when considered separately.

Medical advances, such as new drugs, may be particularly effective for certain impairments only. Because these occur in a stepped manner it is very difficult to extrapolate from the past to the future.

Pricing, policy administration, investment matching, marketing and valuation

None of these areas requires a significantly different approach to aggregate annuities.

The underwriting approach needs to generate a mortality indicator to price the contract. This could be a points score, an equivalent age or something else. It is important that it can be readily converted into a mortality table to be used for pricing.

The greater risks accepted because of limited mortality data would indicate that an increased risk discount rate or profit requirement is appropriate.

The same approach could be used for investment matching as for standard annuities, although the average term of the matching assets would be shorter than for standard annuities. Also, there is greater uncertainty about the length of the annuities until a large portfolio has built up.

Once in payment there is no difference from a healthy life annuity.

The company may find it effective to seek confirmation of continued existence more frequently than for healthy annuities.

To the extent that the mortality risk is reinsured, the valuation can use the reinsurance mortality rates, with an appropriate (but not large) margin for failure of the reinsurer. For the proportion of risk retained, the uncertainty indicates a greater prudential margin than for healthy or aggregate annuities.

The underwriting and pricing are speculative. There is a possibility that the business goes to the company who gets the underwriting wrong and therefore that profits are very difficult to achieve.

Market research needs to be undertaken to determine whether there is enough market demand for the product. Is there a large enough market to obtain the necessary economies of scale? Will there be sufficient volumes to reduce claim volatility?

The company needs to consider what sales channel will be used i.e. brokers, sales through doctors surgeries etc

Expenses will be higher than for standard annuities due to the underwriting required. Costs will be incurred in developing the product that will need to be recouped from the future profit

This question was poorly answered. Most candidates gave a generic answer, without adapting it to the particular situation being considered. Few candidates considered the impact on the rates for standard lives and whilst most candidates identified the importance of underwriting and the mortality assumption, few considered the difficulties of this and of setting the mortality assumptions in any depth, with even fewer identifying that the uncertainty would mean that making profits on this business would be difficult. Surprisingly few candidates considered mortality improvements in general and even fewer considered the specific considerations for this product.