ILA LRM Model Solutions
Spring 2016

1. Learning Objectives:

1. The candidate will demonstrate an understanding of the principles of Risk Management.

4. The candidate will demonstrate an understanding of the principles of modeling, cash flow testing and asset-liability matching, and perform related calculations.

Learning Outcomes:

(1a) Define and evaluate risk.

(4b) Define and calculate duration, convexity and key rate durations including the rationale for matching as a means to manage risk

Sources:

ERM Specialty Guide, May 2006– Chapters 1-6

LRM-120-14: Chapter 14 of Life Insurance Products and Finance, Atkinson/Dallas Section 14.4 only on ALM Matching

LRM-117-14 Key Rate Durations: Measures of Interest Rate Risk

Commentary on Question:

This question was generally done well.

Solution:

(a) Describe the four categories of objectives of Enterprise Risk Management as defined in the COSO report.

Commentary on Question:

Many students could list the four categories of objectives, but of those, a good number had difficulty describing the objectives appropriately.

Some students confused the categories of objectives of ERM with other elements of the COSO report.

1. Continued

Strategic – High level goals designed to support the entity's mission or vision.

Operations – Efficiency of operations, including achievement of performance goals and safeguarding against loss.

Reporting – Reliable financial and operational data and reports.

Compliance – Compliance with laws and regulation.

(b)

(i) (*1 point*) Calculate the modified duration of the liability portfolio.

(ii) (*1 point*) Calculate the convexity of the asset portfolio.

(iii) (*2 points*) Estimate the change in surplus given a 2% increase in interest rates by using modified duration and convexity.

Commentary on Question:
Many students did this question well. The convexity calculation was a common area of difficulty for students.

(i)
Macaulay duration = sum(t × cashflow(t) × v^t)) ÷ sum(cashflow(t) × v^t)
Modified duration = Macaulay duration ÷ (1 + i)

$$Macaulay\ Duration = \frac{\frac{1 \times 100}{1.05} + \frac{2 \times 150}{1.05^2} + \frac{3 \times 250}{1.05^3}}{447.25} = 2.27$$

$$Modified\ Duration = \frac{2.23}{1.05} = 2.16$$

(ii) Convexity = sum(t × (t+1) × cashflow(t) × v^{t+2}) ÷ sum(cashflows(t) × v^t)

$$Convexity = \frac{\frac{3 * 4 * 500}{1.05^5}}{431.92} = 10.88$$

(iii)
% change in PV(cashflows) = –modified duration × (change in interest rate) + 1/2 × convexity × (change in interest rate)^2

1. Continued

$$\%\ Change\ in\ Liab = -2.16 \times 0.02 + \frac{1}{2} * 7.3 * 0.02^2 = -4.18\%$$

$$\%\ Change\ in\ Asset = -2.86 \times 0.02 + \frac{1}{2} \times 10.88 \times 0.02^2 = -5.50\%$$

$$Change\ in\ Liab = 447.25 \times (1 - 0.0418) - 447.25 = -18.68$$

$$Change\ in\ Asset = 431.92 * (1 - 0.055) - 431.92 = -23.74$$

$$Change\ in\ Surplus = -23.74 - (-18.68) = -5.06$$

(c) An actuary at ABC Life contacts you after you've performed your analysis and informs you that the asset backing the liabilities is in fact a 3-year callable bond.

(i) (*1 point*) Describe why the analysis you have already conducted is no longer appropriate.

(ii) (*2 points*) Recommend a methodology which would better measure the impact of interest rate changes on the value of the asset backing the portfolio. Justify your answer.

Commentary on Question:
Many candidates did not provide sufficient detail on why the analysis was not appropriate in part i); simply stating that the duration and convexity would change by adding an embedded option was not enough to receive full credit.

In part ii), most candidates were able to give a recommendation of a better approach, but to receive full credit, more detail was needed to justify why the recommendation was an improvement. While the solution below recommends key rate duration, other methodologies such as effective duration were acceptable.

(i) The interest sensitivity analysis was based on modified duration which is not an appropriate measure for a callable bond. Modified duration and convexity analysis applies to plain vanilla fixed income securities. The callable bond has an embedded option for which the interest sensitivity cannot be adequately measured using modified duration.

(ii) A more suitable methodology to measure interest rate risk for a callable bond is Key Rate Duration (KRD) Matching. This is a vector measuring interest sensitivity of a security at each key rate. With the embedded call option, the bond may have price sensitivity to several key rates which is different than a non-callable bond. KRD recognizes that yield curve movement is driven by multiple market factors. It is easy to use KRD to create a replicating portfolio of a bond with an embedded option using zero-coupon bonds

2. Learning Objectives:

2. The candidate will demonstrate an understanding of the various sources of risks faced by an insurer.

3. The candidate will demonstrate an understanding of important risk measurement techniques along with their uses and limitations, and be able to perform risk measurement calculations.

Learning Outcomes:

(2b) Identify, categorize and evaluate potential sources of risk in investments including but not limited to credit risk, liquidity, equity-based exposure and asset-liability matching.

(2c) Describe and evaluate the other risks an insurance company faces including operational, marketplace and expense risks.

(3b) Apply and analyze scenario and stress testing in managing risk including the calibration and setting of assumptions

Sources:

Chapter 8, Credit Exposure, Credit Risk, Gregory

LRM-106-14: Moody's Looks at RM & the New Life Insurance Risks - 2000

LRM-112-14: Stress Testing OSFI E-18

Commentary on Question:

This question tests the candidate's understanding of exposure to credit risk (specifically exposure to counterparty risk in a reinsurance agreement); the candidate is expected to calculate exposure when considering netting and collateral, and the candidate is expected to identify correct ways to quantify exposure as well as ways to reduce exposure risk. Part d tests the candidate's knowledge of the best ways to stress test risks.

Solution:

(a) Explain how FLD Life and PAQ Re face bilateral exposure.

Commentary on Question:

To get full credit candidates are required to adequately explain bilateral exposure and in the context of FLD and PAQ. Most candidates explained the bilateral nature of the relationship and mentioned reinsurance amounts and premiums in explaining it. However, most candidates failed to mention negative exposure or, if having done so, failed to explain it correctly.

2. Continued

In counterparty risk, both parties can default and experience losses. From the institution's point of view, their own default will cause a loss to their counterparty, which results in negative exposure. Negative exposure is therefore a gain for the institution since it will only have to pay a recovery portion to the counterparty.

If PAQ Re defaults, FLD Life could not recover all of the reinsurance amounts owed to them. If FLD experiences financial stress, they could default on their obligation to pay reinsurance premiums, etc to PAQRe.

(b) Determine the amount of collateral that must be transferred assuming equally weighted scenarios. Show all work.

Commentary on Question:
Very few candidates demonstrated an understanding of all aspects of this problem.

Almost no candidates knew how to properly net the future values over the treaties and scenarios. Almost no candidates recognized that for scenario 2 the future value should be floored at zero.

Most candidates misused the threshold and minimum transfer. A large number concluded that the threshold applied only to FLD Life and that the minimum transfer was the threshold for PAQ Re.

A number of candidates also determined the transfer amount based on scenario; they applied the threshold, collateral held, and minimum transfer for each scenario then took an average to get the actual transfer. The total exposure (average of the three scenarios) should have been derived first before applying the threshold, collateral, and minimum transfer.

2. Continued

Bolded info is given in question; Items in red must be calculated

	Treaty 1	Treaty 1	Treaty 1	Total Exposure w/ Netting	
Scenario 1	100	20	35	155	
Scenario 2	-20	45	-80	0	<--Floored
Scenario 3	55	40	-30	65	
			E(Exposure)	73	

E(Exposure)		73
Collateral threshold	-	50
Exposure Above Threshold		23
Exposure Above Threshold		23
Collateral already held	-	25
Required Collateral		-2
Minimum Transfer Amount		10
Is required Collateral above min transfer?	NO	

FLD would be required to return $2 of collateral to PAQ, HOWEVER this is below the minimum transfer amount so therefore no collateral is transferred

(c)

(i) FLD Life has had no problems receiving collateral from PAQ Re in the past and is confident it will receive collateral from PAQ Re immediately if the need arises; therefore, it should not consider payment of collateral a risk.

(ii) FLD Life should add provisions to its contracts with PAQ Re, specifying the unwinding of the contracts if either company's ratings are downgraded.

(iii) Since PAQ Re has grown rapidly to become one of the largest reinsurers in the industry, FLD Life should use them for all of its reinsurance needs.

Critique each proposal.

Commentary on Question:
Most candidates identified the issues with the risk of collateral payment (i) and the potential concentration risk of using PAQ Re as FLD Life's only reinsurer (iii). But for each question that was only half of what a candidate should note for full credit.

2. Continued

For part (i), to get full credit, a candidate needed to also give examples of why collateral might be delayed.

For part (iii), to get full credit, a candidate needed also to notice that rapid growth and large size are not de facto indicators of financial stability.

For part (ii) almost all candidates felt this was a good provision or agreed it should be included in the treaty. Candidates failed to recognize that a downgrade provision could create a downgrade spiral if an entity was required to unwind a contract at that time of downgrade, which could further amplify the risk and losses.

Some candidates didn't indicate whether or not they thought the proposals were good or bad.

(i) FLD has likely been receiving collateral from PAQ under normal conditions. If PAQ experiences a stress event, or there are abnormal market conditions, it could impair their ability to pay collateral in a timely manner. For example, disagreement over how much collateral to pay, time required to liquidate collateral, or the presence of a grace period.

(ii) FLD Life should not add the downgrade provision. The addition of downgrade provisions could introduce a new type of risk - ratings spiral risk. Once a company is downgraded and the provision is triggered, the unwinding of its contracts could cause further credit deterioration, which could cause an additional ratings downgrade, and so on, and it becomes an endless ratings spiral.

Commentary on Part (ii): If a candidate felt the provision should be included they could receive credit if they recognized the potential for a rating spiral and that each company should proceed cautiously.

Extra content: FLD can add the downgrade provision but should proceed with caution. They must be aware that it can introduce rating spiral risk once the clause materialize. A downward spiral would obviously be bad for FLD, but a downward spiral for PAQ could also have negative effects on FLD.

(iii) Rapid growth of a reinsurer can introduce certain new risks, such as aggressive treaty pricing, loose underwriting controls, new and untested products, and growing single risk exposures. Also simply being the largest reinsurer doesn't mean that they are not susceptible to default.

2. Continued

FLD also needs to be concerned about concentration risk. Since PAQ is now one of the industry's largest reinsurers, if it experiences trouble it could cause a domino effect throughout the industry affecting both the direct and reinsurance markets. FLD also will create concentration risk of their own if they only use PAQ for all of their reinsurance treaties.

(d)

(i) Each risk will be modeled separately, with results capturing the ending asset and liability values. The results will be added together to get a view of the company's total risk.

(ii) The models used will be built, maintained, and reviewed by the actuarial department. The actuaries will be responsible for determining the most relevant risks to test.

(iii) The worst case scenario will be derived by using the lowest interest rates and equity returns experienced in the past 30 years and assuming those are sustained for 10 years.

Assess FLD Life's plan. Recommend improvements.

Commentary on Question:
Candidates need to adequately demonstrate that they fully understood the topic and can apply their knowledge to new situations. They are expected to provide both a critique of the given information and give a recommendation for improvements. Recommendations need to be reasonable, thorough and well-articulated.

Several candidates identified one or two drawbacks and recommended improvements. Very few identified most of the drawbacks or potential improvements. This is in spite of the question lending itself to an analytical approach, for example, where one could critique each word, phrase, or number and identify improvements.

For (i)- Almost all candidates mentioned interrelationships, but only a few mentioned the need for entity-specific and entity-wide views. Even fewer mentioned the need for comprehensive coverage of stress testing or the use of a variety of metrics.

For (ii)- Several candidates identified the need for separation of the duties - building and reviewing, and the need for an across the organization effort risk assessment process.

2. Continued

For (iii)- Most candidates questioned only the '30 year', 'historical' and '10 year' parts. Candidates failed to recognize that the design of any stress test should be aligned with the risks of the enterprise i.e. FLD is exposed to more than just interest and equity risk and life insurance liabilities can extend beyond 30 years.

(i) Stress testing should comprehensively cover product, business, and entity-specific views. Testing each risk separately may not provide an accurate view of the total risk the company could face. A range of metrics may be necessary to get a full picture of the risks.

FLD could improve their stress testing by taking a more entity-wide view of risks. While testing individual risks or products has value, stress testing should also include this entity-wide stress testing, which can aid decision-making when determining business strategy, setting risk appetite, setting exposure limits, etc.

Stress testing should take into account interrelations among risks. In a stress environment, there may be concentrations and interactions between risks that are not apparent or obvious in a normal environment. In addition, only looking at the resulting asset and liability values may not be enough to truly understand the company's risk.

FLD should also look at various result metrics in order to get a more complete picture of the effect of a stress event. Possible metrics to consider are accounting profits/losses, regulatory capital, economic capital, and liquidity and funding gaps (interim projection values).

(ii) Stress testing programs should take into account a variety of perspectives from across the organization. Only having the actuarial department involved provides a very narrow view. While it may be appropriate for the actuarial department to build and maintain the models, there should be an independent review.

To improve the stress testing plan, FLD needs to have people from across the organization be involved in the process. E.g. the investments dept. could provide expertise on stressed scenarios to use with regards to assets, interest rates, etc.

It is important to have senior management perspective as well. The board/senior management should be involved in identifying and reviewing stress scenarios. If the stress testing program does not have the complete support of senior management (the key decision makers of the company), then it will not be an effective risk management tool.

2. Continued

It is also crucial that the board/senior management of FLD be on-board with the program and involved in determining or reviewing stress scenarios. The board needs to understand the results and impact of the stress testing. There should be an independent review of the models used by the actuarial department for stress testing. FLD's internal audit department could audit the process; FLD's risk management area could also assess the program.

(iii) Stress testing should use some non-historical scenarios; just using the worst economic environment of the last 30 years is not necessarily representative of the worst that could happen. Also, this worst case scenario is based on interest rates and equity returns, which are only two of many risks the company could face. Other risks, such as a spike in mortality, could hit the company at the same time as the bad interest rate and equity environment, which could make things even worse.

To improve the plan, FLD should consider even more severe scenarios. Stress testing should be imaginative and consider scenarios that have never occurred. Using a scenario based on historical values of only one or two key risks could lead the company into a false sense of security. FLD should imagine the worst possible scenarios for all of its risks, such as credit risk, insurance risk, reputation risk, etc. Experts from across the company should be involved in helping to develop worst-case scenarios.

Assuming the stress lasts for 10 years may not be long enough to capture the true risk. Life insurance liabilities can last for well over 30 years. A scenario that involves a sudden shock could be a more severe risk to the company than the sustained environment described.

The stress testing should consider sudden shocks as well as risks that linger for a sustained period. The stress testing also needs to consider time horizons that are more consistent with the business; life insurance usually has a long time horizon. FLD should consider doing reverse stress testing, which starts with a specific outcome that challenges the viability of the company, and then works backwards to determine the scenarios that would cause that outcome.

3. Learning Objectives:

2. The candidate will demonstrate an understanding of the various sources of risks faced by an insurer.

3. The candidate will demonstrate an understanding of important risk measurement techniques along with their uses and limitations, and be able to perform risk measurement calculations.

Learning Outcomes:

(2a) Identify, categorize and evaluate potential sources of risk in products including but not limited to mortality, morbidity, and lapse.

(2c) Describe and evaluate the other risks an insurance company faces including operational, marketplace and expense risks.

(3b) Apply and analyze scenario and stress testing in managing risk including the calibration and setting of assumptions

Sources:

Diversification: Consideration on Modelling Aspects & Related Fungibility and Transferability, CRO, Oct 2013, pp. 4 - 14, 19 - 30

LRM -105-14 : Mapping of Life Insurance Risks, AAA Report to NAIC (same as ERM - 401 - 12)

How Fair Value Measurement Changes RM Behavior in the Insurance Industry SoA-Rosner 2013

Commentary on Question:

In general, candidates did well on this question.

Solution:

(a) Define four diversification strategies a company can use to manage the type and amount of risk in its portfolio.

Commentary on Question:

Most candidates knew what this question was asking about, though they may not have been able to provide complete answers. Some candidates misunderstood the question and focused on the techniques used to develop diversification: e.g. using simple summation, covariance matrix, copulas and so on…

3. Continued

1) Pooling similar and sufficiently independent risks - usually similar in terms of the characteristics of the risk subjects

2) Pooling dissimilar risks - writing a diversity of products across different market segments or geographies; decreases chance of experiencing adverse results for large blocks at any given time

3) Combining opposite risks to create internal hedging - insurer can sell policies that behave differently under the same conditions (for example a product that increases risk exposure when interest rates are low and a product that decreases risk exposure when interest rates are low)

4) Limiting risk concentrations in a way to reduce exposure - this can be done by either limiting underwriting to certain specific risks or classes, or through risk mitigation by means of insurance, hedging, or securitization of risks

(b)

(i) Explain the risks DNT Life currently faces, based on its current products.

In an effort to expand DNT Life's product portfolio, the CEO would like to introduce a new product. He makes the following statement:

"To diversify our product offerings, I think we should develop a variable annuity product. An annuity would be a good complement to our life products. The stock market is very good right now, and customers are eager to take advantage of excellent equity returns through a product like this. In fact, I've heard three companies similar to us are developing new variable annuity products right now. In keeping with our tradition of being a life insurer, we should design our variable annuity to have a guaranteed minimum death benefit."

(ii) Identify risks of the proposed product.

(iii) Propose ways to reduce the risks of the proposed product.

(i) **Mortality risk** - Since both products are life products that pay a death benefit, DNT faces mortality risk from both products; an unusually high mortality year or event could impact both lines of business at the same time.

3. Continued

Interest rate risk - The UL product poses interest rate risk since it has a guaranteed credited rate; the 4% rate could result in large losses in a low interest rate environment. The additional 1% bonus adds even more risk; since this product has been being issued for at least 20 years, many policies have already reached the 5 year requirement and are receiving the extra interest (5.0% total).

Interest rate/Lapse risk- Policyholders may not lapse as expected during a low interest rate environment (and, since this is a flexible premium product, they may deposit more premium than expected); if they are getting a good deal on the credited rate, they are likely to stick around, causing DNT to pay more interest on these policies than anticipated.

Pricing/Underwriting risks - The term product introduces pricing risk since it was just introduced last year. It is possible that the product was mispriced; it will take some time (after experience emerges) to see if this is the case. The fact that first year sales were much higher than anticipated indicates that DNT could be exposed to rapid growth risk; rapid growth of the product could put a strain on capital; expenses associated with new business could end up being much higher than anticipated. Since it is a 10 year level term product, the company will not be able to raise the premium for some time if it turns out it was mispriced.

(ii) The variable annuity has market risk; even though the market is good right now, it could perform poorly in the future, causing the product to be more costly for DNT. The fact that three similar companies are designing a new VA product introduces competitive risk. DNT may not sell as much as they anticipate if they are in direct competition with these other companies. The competition could persuade DNT to set prices lower than they should (or be too aggressive with other features they may offer).

Adding a guaranteed minimum death benefit introduces mortality risk. While an annuity is a good complement to life insurance (longevity risk vs mortality risk), adding the death benefit cancels out some of that diversification benefit. All of DNT's products will still have a death benefit and be exposed to mortality risk. As with any new product, this product will be subject to pricing risk; since this is a new type of product for DNT, they may not have the expertise to price it properly or they could have higher expenses than anticipated. DNT could also face political or regulatory risk. VA's have been subject to scrutiny especially since the financial crisis of 2008 when so many companies lost money on VA's. DNT could be at risk of any regulatory rules that are put into place concerning these products.

3. Continued

(iii)

- not setting minimum guarantees too aggressive
- monitor their tail risk exposure with an exposure limit and commit to not selling an amount of policies over a specified limit.
- reduced ratchet and rollups.
- limit the types of funds that the VA can be invested in to limit concentrations of volatile funds.
- use hedging to protect themselves from market and interest rate risk, however they should be sure to account for the cost of hedging.
- product fee structures that are not tied to the account value.
- -consider how policyholder behavior may affect the product, and how this behavior can change under different market conditions. If a certain behavior is difficult to predict or model, DNT should place extra safeguards to reduce their risk.
- -there may be opportunity to reinsure the mortality risk in the minimum death benefit feature.

(c) Analyze the risks each product could pose to DNT Life.

Commentary on Question:
In general, most candidates were able to come up with mortality risk and lapse risk due to the no surrender charges, but some failed to recognize the most significant risks associated with each product, especially the ones in IA and VA.

UL:

- Mortality risk - the last three years have had higher deaths than expected.
- Pricing risk - the product only has 1 underwriting class, meaning males/females and smokers/non-smokers were all priced the same, and so it may have been mispriced.
- There is also lapse risk because there are no surrender charges. BGL was recently downgraded; if the acquisition damages DNT's ratings, more policyholders than expected could decide to lapse their policies with no consequences (no surrender charge).
- The 3% interest guarantee is lower than DNT's existing UL product, so this is less risky for DNT.

Immediate Annuities:

- This block has good mortality experience, which indicates longevity risk.
- Fewer people are dying than expected, meaning the company will be paying out more annuity payments than anticipated. This is BGL's largest block (9,000 policies), so this risk should not be overlooked.

3. Continued

Variable Annuities:

- The variable annuity will add market risk. However, since it is invested in historically conservative funds, this would indicate lower risk to DNT (the variable funds are likely to be less volatile).
- The guaranteed death benefit could add mortality risk, however the experience shows that this block has had mortality near the expected amount. This also indicates the annuity aspect of the product is not showing much longevity risk.
- As with the UL product, there is no surrender charge so this could add lapse risk. If the downgrade of BGL damages DNT's reputation, there could be an increase in surrenders. This is BGL's smallest block of business, so the added risk to DNT may be minimal.

4. **Learning Objectives:**

1. The candidate will demonstrate an understanding of the principles of Risk Management.

Learning Outcomes:

(1a) Define and evaluate risk.

(1d) Describe how risk management techniques may be used to manage capital deployed by insurers and how they impact strategic decision making.

Sources:

Al l on the Same Train, But heading in Different Directions, underwood, Thompson & Ingram

Commentary on Question:

The goal of this question is to test the candidate's ability to evaluate the characteristics of Simple Life's term product as they pertain to the four risk cultures in the Underwood/Thompson/Ingram reading. They are then asked to consider possible risk management strategies and pick one to recommend.

Solution:

(a) Define the following four fundamental types of risk cultures:

(i) Conservator

(ii) Maximizer

(iii) Manager

(iv) Pragmatist

Commentary on Question:

Below is an example of a typical response that would earn full credit. The reading included a table containing other characteristics which would have also earn credit.

(i) Conservator

- Restrict exposure to losses or risks
- Not concerned with growth, below market growth
- Rarely tries new opportunities, gets in at top,
- Smaller losses in unfavorable environment

4. Continued

(ii) Maximizer
- Interested in new opportunities; not a follower
- Concentrates business in profitable segments
- Not concerned about emerging risk before it happens
- Holds minimum capital for ratings/customers
- Expects significant growth > market

(iii) Manager
- ERM often used to optimize best opportunities
- Incentive system is tied to risk-adjusted results
- Interested in emerging markets but not skilled in dealing with the uncertainty
- Misses new opportunities while doing analysis
- Moderates losses in unfavorable environment

(iv) Pragmatist
- Monitors major risks
- Little reliance on models and analysis
- Not interested in emerging risks; prefers more tangible issues
- Periodically rebalances investments, looks for diversification
- No fixed expectations: surplus/ratings/growth/reinsurance

(b) Assess whether Simple Life's term product design was influenced by each of the four risk cultures in part (a). Justify your answer.

Commentary on Question:
Many of the "pros" supporting one culture can be used as a "con" to another. Given the limited amount of information there could be support for or against each of the various cultures and marking was based on the connection between that decision (for / against) and some aspect of the term product as described in the case study.

(i) Conservator
- It does not appear as though simple Life is influenced by the conservator approach. The conservator is not concerned with growth but Simple Life is.
- The conservator restricts exposure to losses and risks, yet SL chooses to continue with this product despite very poor quotes from the reinsurers which could indicate inadequate pricing

4. Continued

(ii) Maximizer
- Simple life appears to be influenced by the maximizer cultures.
- It appears to be unconcerned with the emerging risks as evidenced by the decision to delay repricing
- The focus also seems to be on beating the competition and maximizing growth

(iii) Manager
- Contrary this approach is the lack of any ERM or risk capital modelling and a focus on competitive premium and high growth not necessarily on a risk-adjusted basis.

(iv) Pragmatist
- Does not appear to be influenced by the pragmatist approach since taking on a lot of risk with this product due to the high sales and the large face amount with simplified underwriting

(c) Assess how the following aspects of Simple Life's term life product could explain its 2013 financial results:

(i) Competitive pricing

(ii) Lapse/policyholder behavior

(iii) Reinsurance

(iv) Mortality assumption

Commentary on Question:
Most candidates performed well on this part of the question, although almost all only saw lack of reinsurance as the empty line in the financials and did not see the connection between high reinsurance rates and mispriced product

4. Continued

(i)	Competitive analysis	The combination of high sales with premiums 20% lower than competitors could indicate that the pricing is inadequate for the risk involved Higher commissions can lead to poor quality sales as evidenced by the surgery issue mentioned in the case study.
(ii)	Lapse/ policyholder behavior	Since lapses are much lower than expected – similar to a lapse supported product, this can indicate the market thinks the premiums are really low and so very attractive, especially with the guarantee.
(iii)	Reinsurance	There is no reinsurance on this product, coupled with the high volumes, leads to much higher reserves and capital than usual The fact that multiple reinsurance companies had unprofitable quotes may indicate that the plan is priced inappropriately.
(iv)	Mortality assumption	The current mortality assumptions does not take into account the business mix of the sales – sex, smoking status, size – and may be inadequate. Simplified issue insurance attracts more unhealthy lives and is rarely available at such high sums insured making it more open to anti-selection.

(d) Based on the 2013 financial results for its term life business, Simple Life management is considering the following actions for its next product iteration:

(i) Increase premium rates

(ii) Defer agent commissions to be paid out over two or more years

(iii) Enter the direct to consumer channel to reduce distribution costs

(iv) Introduce paramedical underwriting for face amounts over 500,000

(v) Reinsure exposure over 1 million per policy on a YRT basis

Recommend which actions to pursue. Justify your answer.

Commentary on Question:
For full credit, students were required to justify their recommendation (pursue or not pursue) for each action.

(i) Increase premium rates
The current mortality experience and poor reinsurance quotes may be indicative of underpricing. The premiums can be increase by 10-15% and still be competitive.

4. Continued

(ii) Defer agent commissions to be paid out over two or more years

This is unlikely to change experience without other design modifications since lapses are so low. However, more appropriate pricing can lead to better quality business (e.g. no surgery cases) and reduce principal agent risk

(iii) Enter the direct to consumer channel to reduce distribution costs

Direct channel is probably not part of the solution due to lack of experience and the potentially huge marketing and training expenses required. It could also lead to reduced sales from the brokers because of channel conflict.

(iv) Introduce paramedical underwriting for face amounts over 500,000

A questionnaire is an inadequate mechanism for large face amounts and leads to anti-selection, which is very costly and probably exceeds the cost of paramedical underwriting.

(v) Reinsure exposure over 1 million per policy on YRT basis

Reinsurance would help to spread the risk, reduce both reserves and capital requirements, new business strain and Simple Life would get the reinsurers experience. The reinsurer will likely have experience to help the company with its mortality basis and underwriting requirements if the product is redesigned.