GH SPC Model Solutions
Spring 2017

1. **Learning Objectives:**
3.   The candidate will understand an actuarial appraisal.

Learning Outcomes:
(3b)   Describe an approach for preparing and actuarial appraisal.

Sources:
GHS-109-14 The Actuary and Health Insurance M&As, page 7 – 11

Commentary on Question:
In general, candidates not receiving full points did not spend enough exam time on this question and did not provide full detail as requested in the question.

Solution:
Define and describe in full detail the steps for determining the value of the business in force.

Value of In Force Business
- Is calculated as the PV of future earnings over the projection period on the business in force as of the valuation date
- Actuary develops a projection model, determines starting in force values, creates a specific set of assumptions that reflects reasonable expectations

Projection model
- Model should be appropriate for the business being modeled, data available, time frame in the projection, and budget within business must operate

    3 types of projection models
    1. Windshield Appraisal Models – used when time, data is limited and used to simply determine whether to pursue a more detailed investigation of the business
    2. Intermediate Detail Models – often result from a lack of detailed data; model not as sophisticated as wanted, but info is enough to produce reasonable projection and estimate of value
    3. Full-blown Appraisal Models – fits the situation in which detailed data is available with adequate time to create a sophisticated model. The preferred model to estimate final appraisal value.
- Model also needs to reflect the complexity of the business. Should be flexible enough to easily handle sensitivity testing and produce results that can be explained.

1. Continued

Starting Values
1. Needs to validate the model to reproduce actual premiums, policy counts, and statutory statement reserves as of the starting valuation date.
2. Need to analyze the impact of rate increases that have begun to be implemented before the valuation date, but are not fully implemented as yet.
3. Should be aware of how modal loads, rate increases being implemented, and due and unpaid premiums are reflected in the in force premiums
4. Need to understand what is included in or excluded from the starting claim liabilities and policy reserves
5. Projection formulas and assumptions should be consistent with the definitions of the starting values

Assumption Development
1. Most of the actuary's work in developing an Appraisal Value is the process of assumption development
2. Assumptions need to be reasonable, take into account emerging experience, adjusted to reflect product changes being implemented
3. Assumptions should also support the Actuarial Appraisal. Buyer's assumptions should reflect its own operations rather than the seller's operations. Some may be a directive from management. Key assumptions and their sources should be well documented and disclosed in the actuarial appraisal report
4. Key assumptions include:
    a. Policy decrements, lapses
    b. Premium
    c. Rate Increases
    d. Claims Costs
    e. Claim reserves and liabilities
    f. Unearned premium reserves
    g. Additional active life reserves (policy reserves)
    h. Commissions
    i. Administrative expenses
    j. Income taxes
    k. Investment income
    l. Reinsurance
    m. Appraisal discount rates

The Projection and Key Issues
1. Valuation Date – needs to be set. Often 12/31 of the year just completed, but may be most recent quarter-end or month-end. Availability of in force data as of valuation date influences the choice of valuation date.
2. Partial Years – if valuation date is not year-end date, a partial year needs to be projected unless calendar years are not projected. Need to take into consideration seasonality of the business.

1. Continued

3. Projection Period – length of projection period is set based upon the purpose of the projection, type of business, and other business being projected. Long duration LOBs such as LTC and DI need longer projection periods. Medical business is projected for shorter durations (3 – 10 years).
4. Validation of Results – there are various types of validations.
   a. Static Valuations – used to show that the starting values are consistent with actual values as of the valuation date
   b. Dynamic Valuations – sometimes performed to validate the predictability of the projection model and assumptions by running the model against an earlier in force (e.g., previous year) and comparing projected to actual results. Can be very difficult for many types of health insurance as there are so many varying forces at play at any one period of time.
5. Sensitivity Analysis – Model needs to be able to produce sensitivity analyses on various assumptions in order to be able to communicate the potential range of reasonable risk that is being purchased. Typically performed on –
   a. Lapse rates
   b. Morbidity
   c. Expense
   d. Investment income rates (longer duration products)

2. **Learning Objectives:**
4. The candidate will understand and apply risk adjustment in the context of predictive modeling.

Learning Outcomes:
(4a) Develop and evaluate risk adjustments based on commonly used clinical data and grouping methods.

(4b) Apply risk adjustment to underwriting, pricing, claims and are management situations.

(4c) Describe typical predictive modeling techniques.

(4d) Evaluate the appropriateness of each technique.

(4e) Apply applicable Actuarial Standards of Practice.

Sources:
Duncan Chapters 5, 7, 15, and ASOP 12

Commentary on Question:
This question was very straight-forward, and the topic of the question has been asked frequently on past exams. Most candidates did very well on this question.

Solution:
(a)
> (i) Describe risk characteristics that should be considered when developing a risk classification system.
>
> (ii) Describe items an actuary should consider when establishing risk classes.
>
> (i) Risk characteristics to consider when developing a risk classification system
> - Causality – a cause & effect relationship does not need to be established, but it should make logical sense
> - Objectivity – the risk should be objectively related to the risk classification
> - Practicality – the risks should be reasonable information to collect and include and be cost effective
> - Applicable law – should consider whether compliance with applicable law creates significant limitations on the choice of risk characteristics
> - Industry Practices – consider usual practices for the type of financial system under consideration
> - Business practices – risks should be supported by business and industry practices

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2. **Continued**

      (ii)   Actuarial considerations for establishing risk classes:
- Practicality – use professional judgment in balancing the potentially conflicting objectives of accuracy and efficiency as well as in minimizing the potential effects of adverse selection. Cost, time, and effort should increase with the number of risk classes.
- Credibility – classes should be large enough to represent a credible differential in cost/risk relative to other classes
- Adverse selection – the actuary should establish the risk class such that each has sufficient homogeneity with respect to expected outcomes to satisfy the purpose for which the risk classification system is intended

(b)   Calculate the initial average PMPM payment to your plan for first quarter of 2017. Show your work.

Count of Members	Region Factor	Plan Factor	Risk Factor	Product
3	0.94	0.98	0.8	2.211
3	0.94	0.91	1.5	3.849
2	1	1.07	1.3	2.782
2	1.1	0.91	0.9	1.802
10		Total		10.644
		Average Rating Factor		1.064

Rate: 445 *   1.064 + $39.00   = $512.48

(c)   Describe the reconciliation process for the first quarter of 2017, and the payment calculation for the remainder of 2017.

The first quarter's payment will be made based on the prior quarter's (Q4 2016) risk adjustment factor and enrollment.

Once Q1 2017 enrollment is available, the Q1 payment is reconciled based on actual Q1 risk adjustment and enrollment.

The Average Rating Factor for Q1 is also used for Q2's risk score.

The payment for the remaining quarters: Q3 – Q4, will be calculated based on the prior quarter's information and will not be reconciled.

2. **Continued**

(d)
    (i)   Describe the several ways to judge the quality of a model.

    (ii)   Critique the above risk model with respect to the several ways as answered in (i).

    (i)   Ways to judge quality of a model:
Parsimony – should use as few independent variables as necessary

Identifiability – if the model has more outcomes or endogenous variables than the number of equations or if the number of endogenous variables equals the number of equations but not all of the equations are independent, identification issues will result, including bias and loss of uniqueness in parameter estimates

Goodness of fit – a model is judged to be good if variations in the outcomes variable are explained to a high degree by the explanatory variables, as represented by the R-squared statistic. The larger the R-squared statistic, the better the model at predicting outcomes accurately.

Theoretical consistency – the information included, method, and results should be consistent with expectations and underlying theory

Predictive power – the model should be accurate in predicting outcome information

    (ii)   Comments on this model:
Parsimony – the model does not include too many variables.

Identifiability – model seems unbiased.

Goodness of fit – need more data to compute R-squared.

Theoretical consistency – variables selected make theoretical sense; difficult to tell consistency of outcomes with variables.

Predictive power – no statistics such as the F test are available to comment on

2. Continued

(e)   Describe the features of drug-based risk adjustment models.

Features include adjustments for:
- Similar to medical grouper models except they use drug utilization rather than medical claims
- May be predictive of drug cost only or drug + medical cost
- Risk Adjustment Models include Medicaid Rx, Pharmacy Risk Groups (PRG), and RxGroups (DxCG); all three include Prescription drug and demographic data.

3. **Learning Objectives:**
2.   The candidate will understand and evaluate the risk associated with health insurance and plan sponsorship and recommend strategies for mitigating the risk.

4.   The candidate will understand and apply risk adjustment in the context of predictive modeling.

Learning Outcomes:
(2c)   Integrate reinsurance arrangements within an overall risk management strategy of company plan / sponsor.

(4c)   Describe typical predictive modeling techniques.

Sources:
Code Theory: The Impact of ICD-10 on Predictive Modeling, Predictive Modeling News - August 2012

Group Insurance: Chapter 39 Risk Based Capital Formulas

Commentary on Question:
The question is designed to test whether candidates are able to understand the impact that ICD-10 would have for a health insurer. In general, candidates performed well on this question as a whole.

Solution:
(a)   Describe the advantages of ICD-10 over ICD-9 that will assist insurers in their risk management efforts.

   Commentary on Question:
   Many candidates provided a list of anything referencing ICD-10 rather than clearly identifying advantages specific to insurers.

   ICD-10 is more specific, with more codes and better aids with diagnoses and treatment. It specifically aids in better understanding the best course of treatment, earlier identification and intervention of conditions, potential prevention of chronic or acute conditions, and stronger cost predictions and forecasts.

(b)   Calculate the cost relationship between Percutaneous and Open for repair Face Subcutaneous, based on 2015 data. Show your work.

   Commentary on Question:
   Candidates generally seemed to understand the calculations involved. However, extra care should be given to fully understand what the question is asking as some candidates attempted to solve for something other than what was asked.

3.   **Continued**

Total Claims = 100,000 member months x $68 PMPM = $6,800,000
Cost for OJQ43ZZ = 2 x Cost for OJQ40ZZ = $11,520
Cost for OJQ13ZZ = ($6,800,000 - 220 x $9,210 + 145 x $5,760 + 82 x $11,520)
/ 130 = $23,030
OJQ13ZZ is 2.5 times the cost of OJQ10ZZ

(c)   Calculate the initial RBC for 2015 and the change in 2015 RBC due to up-coding.
Show your work.

Commentary on Question:
*In general, many candidates understood the formula for calculating RBC. Some
candidates did not realize that upcoding would change the number of procedures
for each code but not the total number of procedures.*

The original RBC calculation is
$$RBCAC = H_0 + (H_1^2 + H_2^2 + H_3^2 + H_4^2)^{0.5}$$
$$= 200,000 + (2,300,000^2 + 6,000,000^2 + 500,000^2 + 800,000^2)^{0.5}$$
$$= \$6,694,613$$

Where H_2 = 15% x Incurred Claims From 2015 = 15% x $400 x 100,000

Revised claim counts due to upcoding:
OJQ10ZZ = 220 x 0.8 = 176
OJQ13ZZ = 130 + 220 x 0.2 = 174
OJQ40ZZ = 145 x 0.8 = 116
OJQ43ZZ = 82 + 145 x 0.2 = 111

Original cost = 220 x $9,210 + 130 x $23,030 + 145 x $5,760 + 82 x $11,520
       = $6,800,000
Revised cost = 176 x $9,210 + 174 x $23,030 + 116 x $5,760 + 111 x $11,520
       = $7,575,140
Increase in claims due to upcoding = $7,575,140 - $6,800,000 = $775,140

Revised H_2 = 15% x ($40,000,000 + $775,140) = $6,116,271

The revised RBC calculation is
$$RBCAC = H_0 + (H_1^2 + H_2^2 + H_3^2 + H_4^2)^{0.5}$$
$$= 200,000 + (2,300,000^2 + 6,116,271^2 + 500,000^2 + 800,000^2)^{0.5}$$
$$= \$6,802,179$$

Thus the change in RBC = $6,802,179 - $6,694,613 = $107,566

4. **Learning Objectives:**
1. The candidate will understand pricing, risk management, and reserving for individual long duration health contracts such as Disability Income, Long Term Care, Critical Illness, and Medicare Supplement.

Learning Outcomes:
(1a) Identify differences between short-duration contracts and long-duration contracts, from the standpoints of pricing and reserving.

(1b) Understand utilize experience studies in setting assumptions for long-duration contracts.

Sources:

Commentary on Question:
Commentary listed underneath question component.

Solution:
(a)
(i) Identify the four most important pricing assumptions you should consider when pricing disability insurance.

(ii) Contrast the importance of those four assumptions of an LTD product compared to a major medical product.

Commentary on Question:
Many candidates did not contrast DI to major medical and just focused on major medical Few candidates talked about the contingency margin.

This book has discussed at length the importance of **morbidity assumptions** and the fact that have a high degree of subjectivity. Disability insurance is a low frequency, high severity product. In comparison, major medical is higher frequency and typically lower severity.

Persistency assumptions are also important in the disability pricing process and also vary in different parameters. (Early changes in persistency, which can be either in the lapse rate or mortality rate, can have very significant long term effect due to the long-term nature of the product. As IDI is priced on a level premium basis, the lower the persistency – the fewer number of insureds will reach the ages where the morbidity costs are the highest.)

4. Continued

The **interest rate assumptions**, similar to those in life insurance, make up an integral part of the pricing process that takes on greater importance with interest rate fluctuations. (Due to the large reserves and long-term nature of the product, interest rates have a large impact compared to major med. They are also difficult to project into the future.)

The greater the unknowns in a particular product and the greater the risk, the greater a **contingency margin** should be. It is reasonable to expect that, for any product pricing activity, the insurer should build in a greater margin for products where the risks and unknowns are substantial. (Disability insurance is one such product. The volatility of the disability product including (a) the lack of reliable morbidity data and (b) the large number of variable factors combine to require a significant contingency factor. The greater the unknowns and the more liberal the contract, the greater is the need for contingency margins.)

(b) Evaluate advantages and/or disadvantages of each of the three available morbidity tables for IJK.

Commentary on Question:
Some candidates didn't realize that SSI provides disability income to disabled workers.

	Advantages	Disadvantages	
SOA Group Table	1) reflects significant morbidity changes of the 1990s / updated 2) reliable 3) based on sex, occupation, benefit period, elimination period, size of indemnity	1) not based on individual LTD data / may not be appropriate for group	page 234
SSA Morbidity Table	1) updated 2) reflects the largest volume of data available	1) social characteristics of the SS system less reliable for industry use (in other words different population)	page 234
Company Data	1) company data is most appropriate	1) very low credibility since block of business is described as small 2) does not reflect change in product from any occupation to own occupation	synthesis & knowledge utilization

(c)

(i) Assess considerations that should be contemplated.

(ii) Recommend an approach for determining a confidence interval for DI business. Justify your answer.

4. **Continued**

Commentary on Question:
The question came from Individual Insurance Chapter 11: Pages 318-319. Exam questions are written from the source material as opposed to any private study guides or note cards.

A. It is, therefore, important to provide some quantified measure of 'credibility' or 'reliability' to deviations from expected values, even if rudimentary. One method of doing this to use the A:E ratio, along with an assumed or constructed distribution of expected claims, and compare the ratio to values which are 1, 2, or 3 standard deviations from expected.

B. From our basic statistics classes, we know that if we are looking at a two-tailed test (in this case, we are testing whether the A:E ratio is either unusually high or unusually low), the probability of exceeding a deviation of 1 standard deviation is about 32% if the underlying distribution is approximately normally distributed. Similarly, for 2 standard deviations and 3 standard deviations, it is 5% and 3/10%.

C. The levels used in monitoring system should be discussed and understood by management for this exercise to have meaning.

D. At times (depending on the purpose), A:E values can be suppressed from a report if they appear to signal a deviation, but because of small exposure they didn't exceed the chosen significance level for fear that management might draw inappropriate conclusions. In order to accomplish this, though, it is important to get a clear understanding of the level of deviation that management considers to be significant.

E. One of the easiest ways to provide this "significance of the deviation" information is to determine whether the number of claims meets a specific criterion.

F. In that case, if you have a measure for the expected frequency of such claims (and therefore, by multiplying the exposure, the expected number of claims), this can be developed by considering this a binomial distribution.
1. The standard deviation is given by $\sqrt{n*p*(1-p)}$.

G. This can sometimes be approximated by the Poisson distribution. The Poisson expected value is the same as the binomial, $n*p$. The Poisson standard deviation is $\sqrt{n*p}$. The approximation error in the standard is therefore $\sqrt{1-p}$, which is close to 1 when p is close to zero (or 1, since defining p also defines (1-p), so the analysis is symmetric.

4. Continued

     H. When p is not close to 0 or 1, a better approximation is the Normal approximation. Once the sample exceeds 20 or so in size (usually exceeded in our context by a multiple of 10,000 or so), the Normal curve closely approximates the Binomial. In fact, it is the limiting distribution of the Binomial as n approaches infinity.

     I. If the sample is quite small (say 10-20 or so), the Student's T distribution is useful.

Recommendation:
Since the disability insurance block is a low frequency, high severity business –> p (the probability of a claim) is approximate close to zero. Furthermore, there are not many claims (due to the low frequency) in any particular cell. Thus, the binomial / Poisson distribution should be used. A normal or Student T distribution should not be used since under those distributions, because those distributions are for when p is not close to zero. A lower "significance of deviation" is likely to be considered (e.g. one standard deviation) due to the few number of claims in a cell and the volatility of disability insurance.

(d)   Describe the various roles of internal departments that should be represented on the product development team.

Commentary on Question:
D was straightforward and most candidates did well. We did not accept answers that were simply the definition of the department.

1) Sales and Marketing
    a. The continual flow of information from the most knowledgeable and activity disability sales personnel yields product ideas and points to competitive trends.
    b. Usually, however, such product measures are reactive rather than innovative. Leadership in the marketplace requires innovation, not simply reaction.
2) Actuarial
    a. The actuary must determine how product is to be priced, whether it can be priced safely, and what safeguards may be necessary to develop competitive rates.
3) Underwriting
    a. The underwriter must be consulted to determine whether new underwriting approaches are necessary, how to treat additional risks the new product represents, what safeguards should be introduced to satisfy the selection needs.

4. Continued

    4) Claim Department
      a. A claims manager must determine what new risks and factors it will face in administering claims.
    5) Data Processing & Systems Personnel
      a. This team member estimates the cost and time to build systems or modify existing ones, possibly finding alternative approaches in product design that pose fewer problems, and is needed to quantify the magnitude of project.
    6) Law Department
      a. The disability income attorney's is expected to draft contract language, provide input regarding special legislative and regulatory problems, and avoid problems in state filing and approval.
    7) Investment Department
      a. Has historically not been included, but is needed to quantify impact of potential investment returns on rate structure.

(e) Justify whether or not you believe this feature will be effective in limiting the company's risk.

Commentary on Question:
This was a nuanced question. Most candidates got the general idea that a lower ratio provides incentive to return to work. They missed however, that with high incomes, high incomes, limiting the ratio isn't sufficient.

A. An SOA study indicated a definite correlation between morbidity and the level of the replacement ratio. When the replacement ratio exceeds 50 percent, the actual morbidity escalates sharply above the expected level. The greater the replacement ratio is, the more adverse the actual to expected ratio.

B. In the 1990s, the larger disability income writers have noted that their own claim studies show increased morbidity as the indemnity increases, even without regard to the replacement ratio.

C. Limiting replacement ratio alone may not be sufficient to limit risk. Since physicians (and especially dentists) have high income, limiting replacement ratio may not be sufficient.

5.

Learning Objectives:
2.   The candidate will understand and evaluate the risk associated with health insurance and plan sponsorship and recommend strategies for mitigating the risk.

Learning Outcomes:
(2b)   Complete a capital needs assessment.
- Calculate capital needs for a given insurer.
- Determine actions needed to address issues identified by assessment.
- Describe components of an Economic Capital model.

(2c)   Integrate reinsurance arrangements within an overall risk management strategy of company plan / sponsor.

Sources:
Life Health and Annuity Reinsurance Chapter 18 p.507 & 509
Health Watch (Pribe): Considerations for Surplus Determination under ACA – Pages 26 & 27

Commentary on Question:
Commentary listed underneath question component.

Solution:
(a)   Describe the concept of a reinsurance commutation.

Commentary on Question:
Very few candidates (approximately) understood the concept of a reinsurance commutation.

- Sometimes reinsurers and ceding companies agree that the reinsurer can *commute* its liabilities under an agreement.
  o   In this process, the two parties agree to an amount that the reinsurer will pay to the ceding company to extinguish the reinsurer's share of future benefit payments.
  o   The ceding company uses the funds it receives to establish claim reserves, and the future claims experience is then the sole responsibility of the ceding company.
  o   Both parties perform analysis on their view of expected benefits and investment income to come to an agreement.
  o   Such a transaction allows the reinsurer to exit from older risks and close its books on the block, with no more concerns about claims administration.
  o   The ceding company usually believes it can make a profit on the commutation amount and does not have to have future claims decisions approved by the reinsurer.

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5. **Continued**

(b)   Describe all the major impacts the ACA has had on medical reinsurance.

Commentary on Question:
Candidates did not generally provide the depth in answers that was suggested by the point allocation of the question. Many candidates spent too much time discussing ACA rather than the impact on reinsurance (required to answer the question).

- The primary effect of the ACA was the **removal of annual and lifetime benefit limits** from major medical insurance plans. Direct policies now have no limits. There are three "solutions" to this lack of limits with respect to reinsurance.
  - The stop loss reinsurance market typically has limits in the **form of layers** of coverage; that is, each layer has a maximum amount of benefit payable. In the major medical market, layers may be purchased; each layer would have limits, except the **top layer likely will be unlimited**.
  - If there is **no unlimited layer**, any amounts in excess of the specified layers may revert to the direct insurer.
  - The **reinsurance may be unlimited in nature**, with *reinsurers purchasing similar unlimited retrocession coverages* as deemed advisable by the management of the reinsurer. This option appears to be the clear market leading choice.
- The requirement for unlimited benefits and the inclusion of certain mandatory benefits **has been met with cost adjustments rather than structural modifications in reinsurance**. That is, reinsurance generally covers all risks and prices are intended to reflect those risks and lack of limits.
- Prior to the passage of the ACA, limited medical benefit policies were sold with internal limits for each event, such as reimbursement of expenses incurred up to a specified amount. Under the ACA, such variable payments were disallowed. Today, as described earlier, **limited benefit plans are allowed only if the benefit is a specified amount that does not vary with the cost of treatment**. Such policies are viewed as *supplemental to major medical insurance* although some individuals have only this coverage.
- Some limited benefit plans are still available in the form of **short term contracts of up to eleven months, which are exempt from the ACA provisions**. These contracts are then renewed for a new short term period. *Reinsurance is seldom needed for these plans* as the risk is small although capital may be needed to support growth.

5. Continued

- Some **states have developed state-run exchanges for major medical insurance**; in some of these states, individuals previously covered by that state's high risk pool were migrated into exchanges. This has resulted in very high costs for some exchanges; financial difficulties exist in several of these exchanges and at least one has become bankrupt. ***Reinsurance is provided at rates which are acceptable for the reinsurers, but a net cost to the exchanges***. Changes likely will be needed in the funding of the exchanges.

(c) List and explain the causes of uncertainty after implementation of the ACA even with these programs.

Commentary on Question:
Approximately 1/3 of candidates provided the necessary information to get the majority of points on this part.

- The reinsurance and risk corridor programs are temporary while the risk adjustment program is permanent.
- However, even with these programs, there is still a considerable amount of uncertainty. Causes include:
  - The morbidity risk could be significantly different than expected.
  - The risk transfer payment may not completely reflect the entire morbidity risk.
  - The enrollment could be significantly different than originally anticipated (for example, a plan that is the lowest-priced plan may be surprised by the number of enrollees, resulting in surplus strain).
  - The make-up of that enrollment could be significantly different than expected.
  - Administrative expenses could be much higher than expected.
  - Fixed versus variable expenses could create strain if the enrollment is significantly different than expected.
  - The impact of these unknowns will not be independent.
  - Additionally, one needs to consider the longer-term horizon.

(d) Evaluate the directional impact of each of the following potential items on the RBC ratio. Assume they are independent unless otherwise noted. Justify your answers.

  (i) Actual premium is 5% higher, assuming no changes to claims.

  (ii) Enrollment stays stable into the future, while both premium and claims increase by 4% per year, and administrative expenses remain at 11% of premium.

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5.   **Continued**

    (iii)   Enrollment increases 50% with no change to administrative expenses.

    (iv)   Knowing the impact of (iii), the additional change of breaking administrative expenses into fixed and variable costs.

Commentary on Question:
There was a good distribution of candidate performance on this question.

- Part (i)

  The general results are not surprising, higher premium, with all else being equal, results in higher margin and a healthier financial position (**resulting in a higher RBC level and higher RBC ratio**).

- Part (ii)

  Exhibit 5 summarizes (a similar scenario). This simple model illustrates that even with modest trends and margins, **the RBC ratio will decrease over time**. If the projection were extended a few years, it would show that this company would fall below the 200% threshold. Barring some capital infusion, this company would be placed under one of the authoritative action levels.

- Part (iii)

  If the membership increases, then its revenue and net income increase. However, it is in a much more tenuous financial position. Its equity has decreased, **resulting in a lower RBC ratio**.

- Part (iv)

  It is important to note here for that for the purpose of simplicity, administrative expenses are not broken down into fixed and variable costs. This breakdown would **"increase" the RBC ratio for the "higher" enrollment scenarios**. (The reading uses "decrease" and "lower".)

  Note:

  From a theoretical standpoint, the split of expenses into fixed and variable costs most likely reduces the admin expenses and increases income. This feeds capital and increases RBC. Technically, this is only a marginal increase in the RBC ratio. If a candidate, justifies a no change in RBC ratio due to the fact that admin expenses remains the same after splitting expenses into fixed and variable … this answer should also be given full credit.