LRM Case Study

Introduction and Recommendations

We have summarized this text and have tried to point out things to keep in mind. As you go through the case study you should also think about what sorts of questions could be asked and jot down ideas. This is actually an exercise that you should do when approaching any material on the syllabus.

A copy of the case study will be provided to you during the exam, so there is no need to memorize. You should be familiar enough with the content of the case study so you can quickly look up information.

This case study contains a lot of information. Since you will be given this during the exam there is no point in restating all of the information, rather this summary below is essentially commentary on that information and things to think about as you read.

1) Lyon Corporation of Canada
   a) Overview
      i) This is a multi-national corporation so be ready to think of risks that are applicable for that type of a firm!
   b) Mission Statement
      i) The mission statement tells us that Lyon is not afraid to buy/sell a business unit
   c) Structure
      i) When developing an ERM program one of the first things to consider is setting objectives in light of the various stakeholders. A key stakeholder to consider is the Lyon family which owns 60% of the parent company.
   d) Simple Life
      i) Tomas Lyon owns 51% of the company
      ii) Simple has 4 products (details to come later)
      iii) *What other products could Simple develop? What would be a good strategic fit?*
      iv) Located on Boston, MA,USA
   e) Health Company
      i) Located on CA, USA
      ii) Sells group health and LTC
   f) P&C Company
      i) Located in Omaha, NE, USA
      ii) Writes commercial and personal lines
      iii) *What risks could these other business units bring to Lyon?*
      iv) *Should also consider the diversification these business units bring.*

   g) Lyon Board of Directors
      i) Overview
         (1) 4 of the 12 board members represent the Lyon family
         (2) It is good to be familiar with the names give in the case study. You don't want to waste time on exam day trying to figure out who Andrew, Patrick, or Tomas are.

The case study also gives some background on each person. Once again it is important to be familiar with all of these details, but no need to memorize.

ii) Mandate of the Board
    (1) The board's responsibility is to monitor management
    (2) The board will approve strategic goals, review operations, and provide oversight of financial reporting
    (3) Management then runs the company and day to day activities
iii) Executive Committee
    (1) Members of the executive committee include:
        (a) R. Tomas Lyon III (Chairman)
        (b) R. Tomas Lyon IV
        (c) Patrick Lyon
        (d) Jeremy Orr
        (e) John Ritchie

Looking at the background of these people on the prior pages they don't have anyone technical on this committee. Take some time to assess the backgrounds of each of the committees as well as representation of the Lyon Family on these committees.

iv) Audit Committee – the job of this committee is to review financial statements and disclosures
v) Compensation Committee – this committee will approve compensation arrangements
vi) Related Party and Conduct Review Committee – this committee will review and approve transactions with related parties
vii) Governance and Nominating Committee – this committee will monitor corporate governance procedures
viii) Code of Conduct and Business Ethics – the code of conduct is supposed to support a culture of integrity

h) Credit Rating
    i) Credit Rating = BBB+
    ii) Tailwind → P&C financial results
    iii) Headwinds → Weaken capital position of Simple and failed acquisition at Health Company

i) Oversight of Lyon Companies
    i) There are a lot of "heads" and "chiefs" at this company
    ii) Each of the subsidiaries has a board and an executive team

2) Simple Life Insurance Company (SLIC)
    a) Overview
        i) This company primarily sells term life, but is trying to rebrand itself as a multi-product carrier
        ii) The market is shifting (baby boomers are aging) so they are trying to retool their product portfolio to attract more customers

Be ready for an exam question that focuses on risks of new products or expanding a business. What other products could Simple introduce to attract more customers?

    b) Board of Directors – *once again, it is good to be familiar with names*
    c) Officers
        i) A CRO is not listed as an officer!
        ii) The company currently doesn't have a CFO!
    d) Capitalization
        i) The case study states that there is no long term debt so it is safe to assume that all capital is equity capital
        ii) This will make calculations a bit easier – don't have to worry about multiple costs of capital when calculating WACC
    e) Reinsurance à applies to UL business only

There is no reinsurance for term life! What risks does this exposure the company to? Could the company seek reinsurance for their annuities?

    f) Investment Policy and Strategy
        i) Like most corporations there are a lot of stakeholders in setting the investment strategy
        ii) There are four asset segments – one for each of the products

It is interesting that capital is allocated to the four segments rather than keeping it at the corporate level. The investment strategy sounds "plain vanilla".

    g) Specified Risk Policies
        i) Credit Risk
            (1) There are exposure limits to specific issuers and sectors
            (2) Investment department monitors compliance with exposure limits

Does this make sense? This is like the investment department policing itself. This might be done better by a central risk function.

            (3) Credit Scoring Method à each portfolio has a credit quality score goal, but this system has serious flaws:
                (a) Scores are a linear function of credit rating à credit risk and credit rating do not have a linear relationship! Credit risk increases at an increasing rate as credit rating declines.
                (b) Subcategories are ignored à this is just a bad idea. This will encourage the investment department to load up on "-" ratings to improve return without deteriorating the score.

The case study uses confusing language to describe the credit scoring system. The thing to keep in mind is that since AAA = 1 and AA = 2 then a LOWER score is a good thing.

- ii) Market Risk
    - (1) Simple duration matches A&L with a 0.50 tolerance
    - (2) The company is exposed to non-parallel yield curve shifts
    - (3) GMxB hedging
        - (a) Hedge positions are updated on a fixed schedule à they should consider updating based on market movements
        - (b) There is a six week lag in hedging – depending on the economic environment that could be a very long time!
        - (c) The company only hedges delta and rho, so they are exposed to movements in other Greeks
- iii) Liquidity Risk
    - (1) Scenario testing for liquidity risk is fine, but there are more situations which could cause a liquidity crisis
    - (2) Overall, there needs to be more analysis done for liquidity risk
- iv) Operational Risk
    - (1) CRO is responsible for this risk

One thing to notice is the major risks that are missing from the risk policy. What about legal risk, systematic risk, or insurance risk? More needs to be specified for operational risk.

- h) Economic Capital Model
    - i) Risk metric is 99.5% one-year VaR
    - ii) The model quantifies:
        - (1) Interest rate risk
        - (2) Equity price risk
        - (3) Credit risk
        - (4) Mortality risk
    - iii) There are a lot of flaws in the quantification of risk
        - (1) Data used to calibrate interest rate model is insufficient. The bond market has been a "bull market" since 1994. Need a longer historical period to capture risk.
        - (2) Using only 10-year treasury will ignore changing credit spreads
        - (3) Stochastic approach to interest rate and equity is good
        - (4) Credit risk modeling assumes that bonds are sold when they go below a certain credit rating à this is different than reality where the bond portfolio is managed to a specified credit score. This can overstate credit risk since in reality the company could hold on to a downgraded security and it might recover. The model will lock in losses!
        - (5) Other types of insurance and demographic risk (besides mortality) need to be considered!
        - (6) Operational risk is estimated to be 10% of FVL à should have a more robust method

Once again there are major sources of risk that are not considered in the EC model. All of the risk use stochastic modeling, which is fine, but stress testing is common for harder to quantify risks.

- i) Stress Testing
    - i) Each stress test is applied to the economic conditions as of the valuation date

This brings up an interesting point. Should stress testing be modified based on the current economic conditions? What if the economy is in recession, should the stress test be the same as if the economy is in expansion?

Another thing to think about – we are not told that these stress test target anything. Do these represent the 99.5th percentile?

- ii) Stress testing is done for interest rate risk, credit risk, and equity risk

j) Risk Management Committee
- i) The company just hired a CRO and is creating an independent ERM department
- ii) *There are a lot of questions that could be asked – what should be the CRO's first tasks? What risk frameworks should the CRO consider?*

k) Product Distribution à Simple uses independent brokers

l) Product Descriptions
- i) 30-Year Term Insurance with Level Premium
    - (1) This product is a train-wreck waiting to happen
    - (2) Issuing all coverage with simplified issue is not consistent with the market.
    - (3) There appears to be serious risk and pricing issues:
        - (a) Priced for lapse rate is 5% but the company experiences lapse rates < 2%
        - (b) Breakeven year for this product is likely very long due to the high commission paid (lapse risk)
        - (c) Large face amounts will increase volatility
        - (d) 4.0% discount rate should be compared to current and future expectations

- ii) Variable Annuity with GMAB
    - (1) This product design is dated à guarantees in the industry is more aggressive and structures are different
    - (2) Only returning premium is good from a risk perspective but independent brokers can find better terms for their clients
    - (3) Proposed improvements
        - (a) Adding funds may be good or bad. Increased volatility will increase the cost of hedging. Adding funds could increase or decrease overall volatility.
        - (b) New guarantees will get Simple more in line with the marketplace
        - (c) DOLLAR FOR DOLLAR WITHDRAWALS SHOULD NOT BE ALLOWED!
            - (i) Under these schemes a policyholder can withdrawal most the account value and get a "free" benefit.
            - (ii) Example
                1. Guaranteed amount 15,000, AV = 10,000
                2. Customer withdraws 9,999
                3. Guaranteed amount = 5,001, AV = 1
        - (d) Aggressive timeline for implementation of VA GMxB will expose Simple to operational risk

iii) Universal Life

This product won't always pass IRS 7702 but don't worry about that for this exam. This product wouldn't get approved many state insurance department either, but let's ignore that.

(1) This UL contract is consistent with plain vanilla products sold in the US
(2) Full medical underwriting for all contracts is atypical. Usually there is tiered underwriting depending on how much face amount is requested (e.g., 25K might be GI or simple questionnaire)
(3) The target market is small → non-smoking males age 40-50
   (a) *If Simple is trying to get more of the "baby boom" population, this target market doesn't make sense*
(4) 5-year AA corporate paper does not yield 6% in today markets!
(5) Internal systems
   (a) The company is exposed to operational risk due to the admin system
   (b) Keep in mind that it is a large undertaking for a term life company to develop a UL product
(6) Reinsurance should be seen as a strength. Remember that on their core product (term) there is little underwriting, so Simple likely has a lot of learn from the reinsurer.
(7) Changes to the investment strategy → high yield bonds and private equity will increase risk and volatility

iv) Single Premium Immediate Annuity
(1) This product has some serious pricing issues:
   (a) 10% margin in the premium BUT this is eaten away by 5% commission
   (b) This leaves 5% margin for profit and expenses. Since mortality improvement has been better than expected, this product might not be profitable.
   (c) 4% interest rate assumption will likely not allow the company to earn much money on spreads
   (d) The company is exposed to both market risk and insurance risk
   (e) There could be a lot of risk management questions asked about this product!

m) Balance Sheets
   i) A&L look normal for these products
   ii) Keep in mind that reserve requirements for term products are much lower than UL and annuities
   iii) Healthy RBC ratios
   iv) Be ready to pull numbers from these tables on exam day!

n) Income Statement – be ready to pull numbers on exam day!

o) Portfolio Summary – once again, be ready to pull numbers from these tables on exam day

p) Historical Market Data
   i) A good way to prepare for exam day is to think about what texts could be applied to this data.
   ii) You are given a correlation matrix so perhaps you could be asked to calculate a portfolio VaR

q) SLIC Disaster and Business Continuity Program
    i) This section is actually pretty funny because this stuff actually happens in real life
    ii) The only thing that is missing is a corporate task force to study the use of acronyms within the company
    iii) Be prepared for an operational risk question that uses this information
    iv) What happens if the coffee shop closes?

Review Question

Q: Lyon Corporation has just hired a CRO. What should be the CRO's first five steps in her new position?

This question is pretty wide open so there are a lot of correct answers to this question.

A:

1) Create a Central Risk Function and Adopt an ERM Framework

ERM needs to be consistent across the enterprise. It should by dynamic, nimble and forward looking. ERM should not only manage risk but also assess opportunity.

The CRO should adopt the Partnership model where the CRF works together with the business units to take acceptable levels of risk.

Aspects of other ERM frameworks should be considered for example rating agency models or the Chapman model.

2) Common Risk Language

In order for ERM to be effective there needs to be a common risk language. It is especially important at Lyon due the fact that the company has a diverse set of business units that geographically separated. Different cultures will define risks differently.

3) Risk identification and classification

All significant risks should be identified and classified into a risk register. Different tools should be used to identify risk such as SWOT analysis or PEST. Risks should be classified as long term/short term, high severity/low severity, etc.

These risks should be clearly communicated to the various stakeholders to ensure everyone is on the same page.

4) ERM Culture

ERM culture needs to start at the top, with the CEO. He needs to publically support ERM and back a change in culture at Lyon where risk management is integrated into decision making. ERM also needs to be bottom up.

Risk metrics should be developed and clearly communicated. These risk metrics needs to be embedded into management decision making and strategic objectives of the company.

5) Economic Capital Model

The economic capital model needs work. Below is a short list of improvements.

- Needs to quantify all material risk
- Use combination of stochastic modeling and stress testing
- Aggregate risk across business units
- Assumptions should be use company experience to the extent it is credible and supplemented with industry data
- Various risk metrics should be considered including VaR and CTE. Time horizon and probability levels should be considered in light of stakeholder objectives and regulatory environment.