

INTRODUCTION TO ACTUARIAL MODELS ASSIGNMENT 1

1. The key steps in development of the model are:
 - The objective will be following regulatory capital requirement i.e., there should be only 0.5 % chances of liabilities exceeding assets after one year
 - Data items required here would be cash flows and current asset and liabilities
 - Data could be collected from the company itself
 - Data could be processed using excel
 - Cleaning data, e.g., addressing unusual, missing or inconsistent values.
 - Exploratory data analysis, it could use predictive analysis
 - Modelling the data.
 - Communicating the results.
 - Monitoring the process; updating the data and repeating the process if required.
2. The factors that cause the probability to be inaccurate are:
 - Number of policies sold by company
 - Total premium received
 - Total claims incurred
 - Amount of investment guarantee
 - Options available
 - Risk of the investment
 - Pricing model of the company
3. Key Steps in a modelling process
 - Objective – projecting future mortality
 - Plan how the data will be collected and utilized
 - Collect data from life insurance companies and government and from other appropriate sources and analyze them
 - Parameters in this case are likely to be; past mortality rate, current health standards, current diseases, etc.
 - Define the model initially by capturing the essence of the real-world system. Refining the level of detail in the model can come at a later stage.
 - Involve the experts from the health industry who have knowledge relating to this field
 - Decide on which simulation software is to be used
 - Code the program
 - Debug the program to make sure it performs the intended operations in the model definition.
 - Test the reasonableness of the output from the model.
 - Review and carefully consider the appropriateness of the model in the light of small changes to the input parameters.
 - Analyze the output from the model.
 - Ensure that any relevant professional guidance has been complied with. For example, the Financial Reporting Council has issued a Technical Actuarial Standard on the principles for Technical Actuarial Work (TAS100), which includes principles for models used in technical actuarial work.

- Communicate the result and the mortality rate that came out
4. Key items to be included in the documentation of the model are:
 - Parameters used
 - Assumptions used (if any)
 - Source of the data
 - Limitation of the model
 - Type of the model (scenario based, stochastic, proxy, etc.)
 5. Advantages of this strategy are:
 - Simple to understand
 - Low investment to make the model
 - The model takes age aspect in consideration
 - Variation of consumption is taken in consideration
 - This model can adapt various population and can also be used for different projects

Disadvantages of this strategy are:

- Past trends in consumption doesn't state perfect prediction for future
 - Future unforeseen events may affect the business
 - The rapid growth in past years may mislead the future projections
 - Consumption of the scrummy bars may reduce if more health conscious people come
6. The reasons why the results are different are:
 - The new run might have been incorrect as the new trainee might not have full awareness of the set up
 - The expectation that parameter change was not sensitive to model is incorrect
 - If the model is based on a random number generator, then the result could be affected
 7. The appropriateness of the proposed modeling approach is:
 - The model should be easy to understand
 - The data should be reliable
 - Although it is possible that the starting point for planned population may be wrong
 - The model is relatively straightforward to explain to developers
 - Current age distribution for the area may not be represented by the population of the new town
 8. Factors the company should take into consideration when developing the model are:
 - The nature of the existing sickness data the company possesses
 - Previous models (if any)
 - The complexity of the model
 - Definition of sickness and level of benefit under the scheme
 - Trends in sickness at national level
 - Ease of communication of the model
 - Capability of the staff

