

1. The first step would be to develop a well defined set of objectives, which in this case would be to hold sufficient capital such that the probability of liabilities exceeding assets after one year is less than 0.5%.

- After which the modelling process will be planned

- Necessary data will be collected. This will be done by analysing previous years' data and ~~forecast~~ estimating future assets and liabilities

- Define the parameters for the model, in this case, the parameters are assets and liabilities. Consider appropriate values for the same which will be done by the help of the previous step.

- Involve experts on the real-world system that is being modeled which would include other fellow actuaries or accountants or economists and get feedback on the validity of the conceptual model.

- Write the computer program for the model.

- Debug the program to ensure it performs its intended purpose.

- Test reasonableness of output to check if it's not giving any irrelevant outputs

- Carry out sensitivity-testing

- Analyse the output & thereafter communicate & document the results & the model.

2

The probability could be inaccurate if:

- Some policies are surrendered
- A major chunk of the policyholders do not pay their premium on time.
- There are fraudulent/inflated claims
- A sudden 'Black Swan' event occurring which is not accounted for in the model.

3.

- Developing a well defined set of objectives - constructing a model for forecasting future mortality.
- Plan the modelling process and how the model will be validated.
- Collecting and analysing necessary data for the model - obtaining the past mortality records of the country from the government itself.
- Define parameters of model & consider appropriateness of parameter values - Parameters would include number of deaths in a day, age of deceased etc.
- Involve experts & get feedback from them

- Write the computer program for the model
- Debug the program to ensure that it is serving its purpose
- Test the reasonableness of the output to check if it's not giving any irrelevant outputs such as a negative mortality rate for example.
- Sensitivity test it to check appropriateness
- Analyse output & then communicate & document results & model.

4.

The Parameters

Data

Objectives

Results in layman's terms

5.

ADVANTAGES

- Easy and less time consuming strategy without using a lot of resources.

DISADVANTAGES

- The new generation might not like the product as it may have become outdated or they might have just acquired a new and different taste

6.

- While When the revised model was made, there might have been a certain parameter which was correlated to the one being changed which was not accounted for by the new diff new different student.
- The first actuary might have made the model a bit too complex (a black box), thus the newer actuary might not have been able to comprehend and thus not replicate it
- The newer actuary might not have the adequate education/qualification/knowledge to exactly reproduce as it is.

7.

- The model is partially appropriate as it takes almost all the parameters necessary for the model to be made such as the population distribution, fertility & mortality rates & therefore the projected population distribution.
- I would further add the parameters of availability of school teachers to have a good teacher to student ratio & also estimate how much each household is willing to spend as an annual fee on each of their children in order to make the schools affordable.

8.

- Number of days an employee stays sick
- Average payout per employee for sick days.