INSTITUTE OF ACTUARIAL & QUANTITATIVE STUDIES

Class: M.Sc Sem 3

Subject : Actuarial Practice 1

Chapter: Unit 1 Chapter 1

Chapter Name: Actuarial Control Cycle

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1 What is the Actuarial Control Cycle (ACC)?

The Actuarial Control Cycle (ACC) is a fundamental tool of risk management - a process of analysing, quantifying, mitigating and monitoring risks.

The ACC follows the following approach to problem solving -

- Defining the problem
- Designing and implementing a solution
- Monitor the effectiveness of the solution and improvising it if necessary

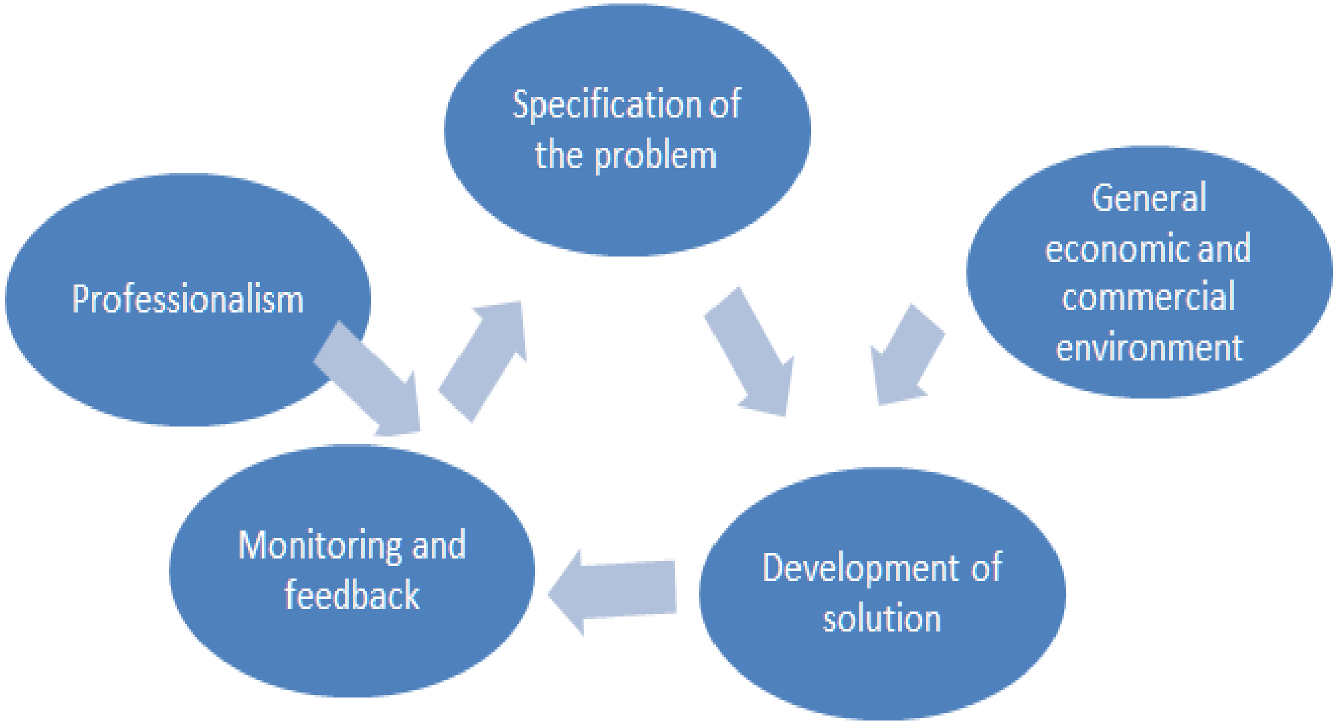
1.1 Purpose of the Actuarial Control Cycle

The purpose of the Actuarial Control Cycle is to provide an understanding as to how the underlying actuarial principles can be applied to a range of real-world problems and issues in the commercial and business environment

- Assessing the financial effects of uncertain future events
- Taking the perspectives and interests of various stakeholders into consideration
- Short term decision making for likely future outcomes
- To allow for external factors like taxation, regulation, competition
- Monitoring and analysing the experience
- Modifying the models to allow for new assumptions and changes

1.2 Components of the ACC

The ACC can be diagrammatically represented in the following manner:



1.3 The General Economic and Commercial Environment

An actuary needs to be well versed with the kind of environment the problem is being tackled in and how the environment affects his decision.

Ex. An actuary working in the field of life insurance needs to aware of the following

- Rules and regulations pertaining to life insurance products.
- Jargon or different terms used in the industry.
- The different products offered by competitors and how competitive are their prices.
- Which product attracts which group of customers and the risks associated with it.
- The different reinsurance products available in the market.

List the factors that would make up the General Commercial and Economic Environment for an Actuary working in the field of portfolio management

1.4 Specifying the Problem

- Specify the problem and analyse it from each shareholder’s perspective.
- Identify and assess the risk faced.
- Provide a framework for assessing alternative strategies for handling, mitigating and transferring the risks.
- Look for alternate options that help transfer the risk from one stakeholder to the other.

1.4 Specifying the Problem

Example: An investment company is planning to enter the insurance market by launching a term assurance product. What are the various problems and risks that they may face?

The risks faced by the insurance company would be:

- The risk of adverse mortality in case of a pandemic
- Adverse critical illness or sickness rate
- Poor investment performance as a result of a market crash
- Risk of poor sales due to competitive prices offered by other companies in the same industry
- Taxation and regulatory changes brought in by the government or other regulating bodies
- Lack of data, knowledge and expertise in this market
- High expense inflation
- Charging too low premiums to gain market share

1.5 Developing a Solution

This stage involves the following steps

- A review of the actuarial model of cash flows currently in use
- The adjustments to be made to the model to solve a particular problem
- Assumption applicable to the model need to be selected appropriately and check for the model’s sensitivity for to each assumption
- Interpretation of the results of the modelling procedure
- Determining a proposed solution
- Investigating alternative strategies for risk management
- Predicting future results
- Clear communication of results for informed decisions to be made

1.6 Monitoring the Experience

- Model needs to be dynamic and must reflect the current experience
- After monitoring feedback needs to be given into other stages of the cycle
- Draw comparisons between actual and expected results in terms of mortality, expense, claim rates, business mix and volume, etc.
- Identify and understand any discrepancies as a result of:
  - Partial knowledge regarding the problem
  - Inappropriate model or outdated assumptions
  - Changes in the general commercial environment that might have not been expected

Important for results of the monitoring process be used, using feedback loops where inputs are given for each stage of the cycle. This might help find if any vital feature was missed and not taken into account or that the problem was not fully specified

1.7 Professionalism

1. It affects the way an actuary carries out the work and presents advice to the potential clients
2. Actuaries have professional responsibilities towards various stakeholders:
    - employees
    - policyholders
    - regulatory authorities etc

3. As a result an actuary must:
    - act with integrity
    - consider any conflict of interests
    - provide relevant and ethical solutions
    - have appropriate experience

2 Practical Application of the ACC

- Estimating premium rates to ensure the benefits promised are payable on account of event
- Look for alternate investment and risk management options
- Asset liability management
- Valuation of the capital required for protection against future risks
- Estimating the current and future profitability and solvency
- Assessing the need for and the calculation of reserves
- Monitoring mortality, expenses of the organisation and assumptions to be used in a model
- Discuss and apply the process of product designing

List any other problems where the Actuarial Control Cycle can be applied to.

3 What is Risk?

" Risk can be defined as the possibility that an outcome or an investment's actual gains will differ from an expected outcome or return. It also includes the possibility of losing some or all of an original investment "

The different types faced by an organisation are:

- InvCredit risk
- estment risk
- Credit risk
- Insurance risk
- Inflation risk
- External risk
- Business risk
- Foreign exchange risk

Risk can be ambiguous. An outcome that is a risk for one party may be a reward for the other. Thus an actuary needs to consider the interests of various stakeholders when advising on risk management

3 What is Risk?

- One of the main reasons for risk can be asset – liability mismatched
- Asset – liability mismatching can be reduced if both assets and liabilities behave in the same manner i.e if an increase in liabilities corresponds to an increase in asset proceeds, then the risk of mismatching can be reduced
- Asset liability mismatching happens due to
  - ➢ mismatch in values or amount eg. If interest earned on savings is lower than expense inflation
  - ➢ mismatch in timings eg. Contracting an illness in the first year of a health insurance policy which promises benefit payments after one year has passed .
- Risk can be measured as :

  Risk = probability × impact
- However the quantification of risk depends on:

  - risk appetite

  - Objectives

3.1 ACC as a Risk Management Tool

- Risk cannot be avoided under any circumstances. It can be :

- considered as an opportunity, where profits can be generated by assessing a price for the risk
- managed using the Actuarial Control Cycle

- After having the risk identified and understood (specifying the problem) the Actuarial Control Cycle can then be used to manage it by mitigating and monitoring the risk

- Risk can be mitigated by:
  - avoiding the risk
  - accepting and minimising the risk
  - sharing the risk
  - transferring the risk

3.2 Types of Clients that need Actuarial Advice

1. Private sector	• Policyholders • Members of benefit schemes and their dependents • Employers • Insurance company board of directors • Insurance company creditors • Employees • Investment fund managers • Banks
2. Public sector	• Central government • Local government departments • Central bank • Other regulating bodies

3.2 Types of Clients that need Actuarial Advice

In many cases, advice given by the actuary affects several stakeholders. The actuary needs to consider the interests of all stakeholders and not only those who seek and pay for the advice

Example : Consider an actuary giving advice to the board of directors of an insurance company that is planning expansion. Discuss the various stakeholders affected by this advice and how?

- The company’s policyholders for the level of benefits they would receive
- The level of premium charged to new and existing policyholders
- Shareholders on the level of dividend they would receive
- The government for the level of taxes received by the Government on profits earned by the company
- Different insurance companies competing in the same market
- Reinsurance companies for the level of reinsurance they might end up getting from the company
- Regulatory authorities for ensuring proper compliance
- Employees of the company through the level of employee benefit

An insurance company A is taking over another insurance company B. List the various stakeholders affected in this scenario.

4 Gathering client information before advising

- Important to gather all the information about the client that is relevant to the problem as this has implications on the solution and sets the course for other alternatives
- Information regarding the client might be available on public domains such as company accounts or other publications
- Information can also be assimilated from the company's website if any
- Any subjective information of the client, such as their background, ethical stand and culture should be known
- Have frequent follow-up meetings with the client to ensure that any new information that is important for the solution is considered

You are an actuary at Ace Consultancies, which has been approached by an insurance company, planning to venture into crypto currencies as a mode of investment. Suggest all the information you will require about the insurance company, to provide them with advice in the best of their interest.

4.1 Conflict of Interests

Advice given to one client may not always be in the best interest of another stakeholder. This is where conflict of interest arises.

Conflict of interests cannot be avoided but they can always be minimised:

- Thorough communication of the potential conflicts to the concerned parties
- Complete independence of work between different teams
- Having Chinese walls between various departments of the company
- All forms of data must be secured and kept away from being shared amongst various departments
- Getting the balance right between the various stakeholders is very important

Example: An actuary providing advice both to the owners of an insurance company and its prospective policyholders where the owners might want to charge as high a premium possible and the policyholders would want the best price for the benefits

4.2 Types of Advice

- Inactive advice – giving an opinion without fully considering the issue- a verbal response to a direct oral question
- Factual advice – based on research of facts
- Recommendations – researched and modelled forecasts, alternatives weighed, recommendations made consistent with requirement, work normally peer-reviewed

Peer Review is the evaluation of work by one or more people with similar competencies as the producer of the work. It is a form of self-regulation by qualified members of a profession within the relevant field

4.3 Giving Advice

- Making assumptions that are in line with the circumstances of the client
- Giving reasonable explanation to clients for having made those assumptions'
- Keep clients informed about alternate assumptions and solutions and their implications
- An actuary is only concerned with giving advice and presenting a solution, the final decision is the client

Example: An actuary may advice the client to provide performance based appraisals or bonuses to retain good quality work-force. The final decision of the level of bonus will be taken by the client.

4.4 Decision Making

- Actuaries have little to no role in decision making
- They can be decision makers in matters of reserving, the level of reinsurance required, asset allocation etc.
- In such cases it is ethical for the actuary to take decisions that are in the best interests of the firm, and not in that of his personal gains
- To avoid this it is good to have a peer review of the work

4.5 Professionalism and Ethics

To ensure thorough professionalism , actuaries need to adhere to the Actuaries' code published by the Institute and Faculty of Actuaries (IFoA). The Actuaries' Code follows the principles of :

1. Integrity
2. Competence and care
3. Impartiality
4. Compliance
5. Speaking up
6. Communication

The Institute and Faculty of Actuaries, also ensures ethical and best practice standards which applies to all actuaries irrespective of their area of work. This is published in the Institute and Faculty of Actuaries Standards.

4.6 Technical Standards

Technical actuarial standards are the responsibility of the Financial Reporting Council (FRC)

The FRC issues the Technical Actuarial Standards. It aims at

- Reliance on the information's relevance
- Transparency of assumptions
- Completeness and comprehensibility

The FRC has also developed the Actuarial Quality Framework which is designed to support effective communication between actuaries and other stakeholders. It aims to promote:

- Methods- reliability and usefulness of actuarial methods
- Communication- communication of actuarial information and advice
- Actuaries- technical skills, ethics and professionalism
- Environment – working environment and other factors outside the control of actuaries