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 Overview of ACC

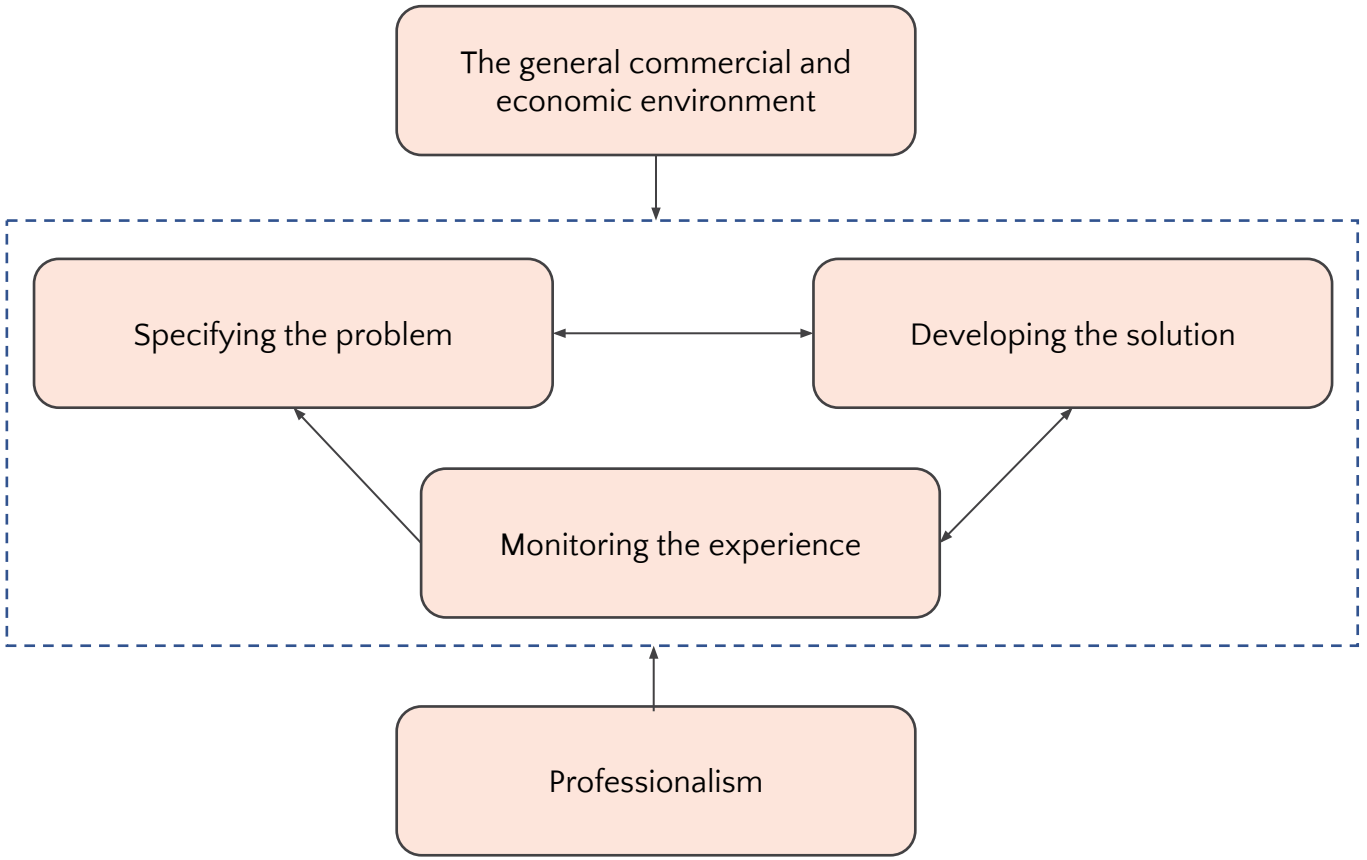
The Actuarial Control Cycle (ACC) is a fundamental tool of risk management – a process of analysing, quantifying, mitigating and monitoring risks.

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

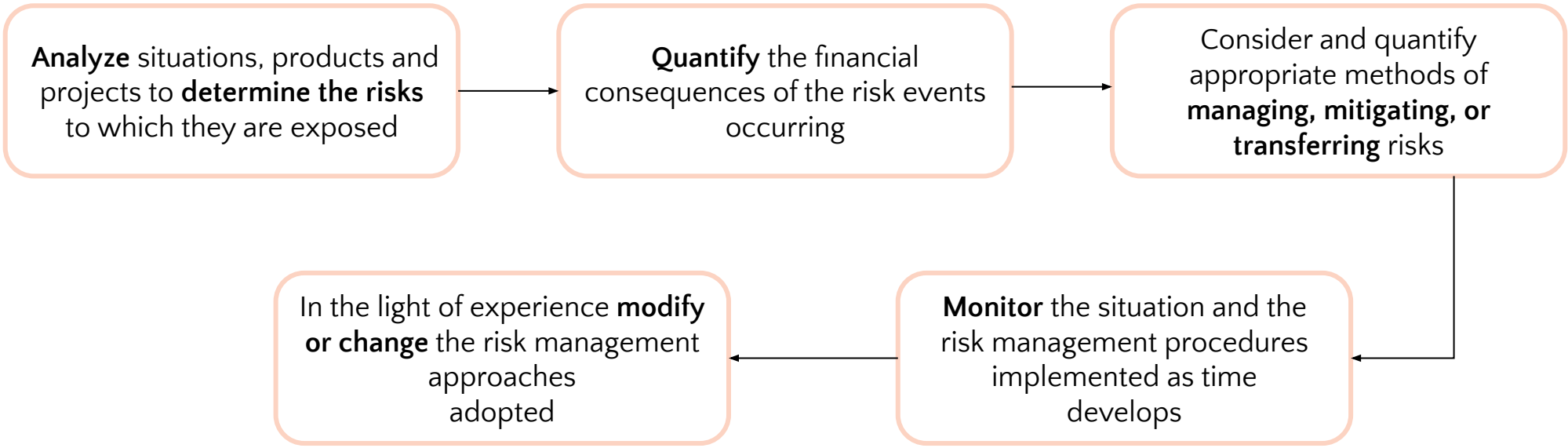
2 Framework of ACC

The ACC can be diagrammatically represented in the following manner:



2 Framework of ACC

The approach to problem solving includes the following processes:



The final step above indicates that the process is cyclical. The approach used in almost all risk management tasks is that of the actuarial control cycle.

2 Purpose of ACC

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 analyzing the experience
- Modifying the models to allow for new assumptions and changes

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3 Steps in ACC

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

3 Steps in ACC

Specifying the problem

The first stage of the actuarial control cycle is to identify and analyze the risks of the various stakeholders in detail, and to set out clearly the problem from the point of view of each stakeholder.

It can be summarized as follows:

- **Specify** the problem and **analyze** 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.

3 Steps in ACC

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

3 Steps in ACC

Developing the 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

3 Steps in ACC

Monitoring the experience

- Model needs to be **dynamic** and must reflect **the current experience**
- This stage deals with the **monitoring of experience and its feedback** into the problem specification and solution development stages of the control cycle, such as updating the investigation.
- Draw comparisons between **actual and expected results** in terms of mortality, expense, claim rates, business mix and volume, etc.
- Identify and understand causes of any departure from the targeted outcome from the model

Feedback loops

It is important that the results of the monitoring process are used. These can be 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

3 Steps in ACC

Professionalism

- It affects the way an actuary carries out the work and presents advice to the potential clients
- Actuaries have professional responsibilities towards various stakeholders:
  - employees
  - policyholders
  - regulatory authorities etc.
- As a result, an actuary must:
  - act with integrity
  - consider any conflict of interests
  - provide relevant and ethical solutions
  - have appropriate experience

List any professionalism standards that are laid out by any domestic or international body for actuaries

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4 Practical Application of ACC

Each of the common actuarial issues set out below are representative of the practical problems that arise in the areas in which actuaries work. The actuarial control cycle provides a framework for the discussion of these problems and issues that arise in addressing them

- 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 organization 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.

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5 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 organization are:

- Credit risk
- Investment risk
- Insurance risk
- Inflation risk
- External risk
- Business risk
- Foreign exchange risk

Risk is a concept that is very much situation dependent ('in the eye of the beholder')

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

5 What is Risk?

List the common risks faced by banks, hedge funds, life insurance companies and general insurance companies. Also list some of the methods through which these risks can be mitigated

Asset liability management

- Risk generally occurs when:
  - The value of assets and/or asset proceeds are not as expected, or
  - The value of liabilities and/or liability outgoes are not as expected

- **Asset proceeds** might not be as expected due to market risk and credit risk

- **Liability outgoes** might not be as expected due to inflation risk, underwriting risk, insurance risk, exposure risk, finance risk, operational risk and external risk

- The risks relating to asset proceeds and liability outgoes might present less of a problem if both assets and liabilities 'behave similarly'.

6 Measuring risk

- Risk can be measured as:

  Risk = probability × impact

- However, the quantification of risk depends on:
  - risk appetite
  - Objectives

Why do you think different individuals may have different risk appetite

7 Managing risk

Do you think that risk is not good and that it should always be avoided or rejected?

When faced with risks we might take two, very positive, viewpoints:

- Risk is an opportunity
- We can manage risk successfully

Risk is an opportunity

A price can be put on many risks faced by individuals and organizations. Anything that can be priced offers the opportunity to make trading profits.

Mitigating risk

Having correctly identified the risks to which we might be exposed, the next step (using the approach given by the actuarial control cycle) is to consider how they might be mitigated. For any that can't be avoided or eliminated – and for many that won't be possible – careful management, monitoring ands mitigation will be required.

8 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 as discussed before

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

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9 Types of Clients that need Actuarial Advice

Which are the types of clients that actuaries generally provide advice to?

9 Types of Clients that need Actuarial Advice

Private sector	Public sector
Current and prospective policyholders	Central and local government departments
Members of benefit schemes and their dependents	Central banks and regulatory bodies
Employers and employees	
Insurance company stakeholders – board of directors, shareholders, creditors, auditors	
Trustees and sponsors, auditors of benefit schemes	
Investment fund managers	
Members of investment schemes	
Sponsors of capital projects	
Banks	

10 Stakeholders that are affected by 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.

11 Interests and functions of clients

The stakeholders discussed before have a wide range of interests and functions that actuaries can provide advice on

List potential areas of advice of each potential client. Aim for two areas of advice for each client, wherever possible

12 Advice and decisions

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
- 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.

12 Advice and decisions

Conflict of interest

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 minimized:

- 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

12 Advice and decisions

Types of advice

Different types of advice that can be given include:

- **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

12 Advice and decisions

Giving advice

The areas that needs to be considered where an actuary is giving an advice but does not make the decision as to which solution to adopt:

- 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.

12 Advice and decisions

Decision making

- Sometimes the actuary may be responsible for making a **business decision**. An example of where an actuary may make the decision is in the determination of surrender values under life insurance policies, where the policy wording permits.

- Sometimes, an actuary may also have an **executive role** within an organization and may be making decisions on matters such as provisioning, reinsurance programs and asset allocation.

- In such situations there is a danger that the actuary will take decisions based on his or her own conclusions and the actuary should seek further **advice or peer review** of the decision made.

- It is vital that the rationale behind any decisions taken is **properly documented**, including documentation of alternatives that have been considered.

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13 Professionalism and technical standards

To ensure thorough professionalism, actuaries need to adhere to the **Actuaries' Code** published by the Institute and Faculty of Actuaries (IFoA).

The **Actuaries' Code is structured around the following six principles:**

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

Professionalism is essential in setting the scene for the context in which the actuary will operate. The basic principles of professionalism will determine the suitability of solutions to the problems raised.

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.

13 Professionalism and 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

Topics covered

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- Managing risk
- ACC as a risk management tool

Actuarial advice

- Types of clients
- Stakeholders that are affected
- Interests and functions of clients
- Advice and decisions

Professional and technical standards