



# THE ROLE OF THE ACTUARY

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**This paper has been produced by the Role of the Actuary Task Force of the Executive Committee (EC). The EC has adopted it as a generic document that can be used as written or adapted by member associations for use in their jurisdictions.**



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Actuaries fulfill many roles in a broad range of environments, including insurance companies, health organizations, pension plans, risk management, government, regulatory regimes, and in other fields. They have a detailed understanding of economic, financial, demographic and insurance risks and expertise in:

- developing and using statistical and financial models to inform financial decisions;
- pricing, establishing the amount of liabilities, and setting capital requirements for uncertain future events.

Actuaries also provide advice on the adequacy of risk assessment, reinsurance arrangements, investment policies, capital levels and stress testing of the future financial condition of a financial institution. In this paper “financial institution” is used broadly to include pension plans and governmental systems, such as social insurance plans, as well as retail and investment banks.

One of the key skills of an actuary is the development and application of models to help solve complex financial problems. This skill is now being applied successfully in many areas of business beyond the financial sphere. Actuaries add value to the raw output of a software model by using their professional judgment to assess and explain the practical implications of the results and the limitations of the model.

The roles that actuaries perform are likely to vary over time, by country, practice area, relationship to the financial institution, corporate structure and culture. The appendix identifies roles currently undertaken by actuaries and highlights areas where actuaries could play a more prominent role in the future.

## Role of a Professional Actuarial Association

The role of a professional actuarial association varies from country to country. However, most associations:

- create a credential that people in the actuarial field may earn, confirming that they have met high educational standards and are bound to high standards of professional conduct and practice,
- enforce professionalism requirements on qualified actuaries,
- further the science and art of actuarial practice,
- serve as the voice of the profession in the public interest when interacting with governments, the public, and other organizations,
- promote the profession to the public and users of actuarial services, both current and potential, and
- provide continuing professional development for their members.

Although critical decisions may be made on the advice of an actuary, in many countries the word “actuary” is not a reserved term; that is, it is not defined in legislation or statute, nor is it reserved for individuals who are professionally qualified. This is in contrast to some other professions (for example, lawyers, doctors, architects, and dentists) which have titles reserved by law for qualified members, to protect their users. While users of actuarial services are typically not protected in that way, reliance on an actuary holding a designation granted by a professional actuarial association can provide similar reassurance.

## Role of the International Actuarial Association

The International Actuarial Association (IAA) provides guidelines for its member associations. To become recognized as full members of the IAA, associations need to demonstrate that each of the following meets IAA guidelines:

- their educational system and requirements for membership,
- their code of professional conduct,
- their disciplinary process, and
- their system for developing standards of actuarial practice (if they have one).

Once recognized as an IAA member, each association must continue to meet the IAA guidelines. These guidelines help assure that the individual actuaries who belong to full member associations also meet appropriate standards.

The IAA cannot control the use of the term "actuary," but it can set professionalism guidelines for those who are members of IAA and is happy to assist both the local regulator and the local actuarial association wherever desired.

## Description of a Qualified Actuary

A qualified actuary is a professional trained in evaluating the current financial implications of future contingent events. It is the actuary’s job to assist in the scientific analysis and quantification of risks. Expertise in understanding the underlying business dynamics, backed by training in economics, finance, demographics, statistics, and risk management, helps to ensure that actuaries build models which make best use of the available information. In general, actuaries excel in problem solving. Actuaries are equipped to help their clients and employers to make informed choices.

Actuaries work with financial and other institutions to measure, manage, and mitigate risks. Financial institutions accept risks (such as liabilities arising from death, auto accident, legal responsibility, outliving one's assets) from individuals or other companies for commercial reasons. By pooling large numbers of these risks, the financial institution reduces, but does not eliminate, the variability of their total cost. Actuaries use statistical models and analysis to enhance their understanding of this variability and the risks inherent in the assets used to back these promises.

In the context of insurance, for example, actuarial skills are used in establishing premiums, policy and claim liabilities, and appropriate capital levels. In other contexts, these skills are used to evaluate pension plan liabilities and determine the level of contributions required to finance pension, health care, and social insurance programs. Non-financial institutions can also benefit from the advice of actuaries.

## Role of Users of Actuarial Services

The users of actuarial services can be reassured by the extent to which an actuary has been trained and credentialed by a professional actuarial association and is subject to qualification standards, professional standards of practice, and obligations for professional conduct. Employing a qualified actuary can greatly strengthen a financial institution's risk and capital management, resulting in increased security of policyholders, shareholders and beneficiaries, to the benefit of the institution and its regulators. Analysis and projection of the finances of a social security program by a qualified actuary can assist in the program's management by the government or other responsible agencies, and, where published, help inform a wider policy discussion. Appropriate involvement of qualified actuaries can help plan administrators to enhance the effectiveness of the plan management. Furthermore, appropriate involvement of qualified actuaries can help supervisors enhance the effectiveness of the regulatory process.

Supervisors and other users of actuarial services are encouraged to work with the IAA member associations to determine the appropriate functions for qualified actuaries providing professional services in their jurisdictions.

**Roles (a non-exhaustive list) typically filled by actuaries currently include:****a. Life and general insurance**

- Establishing estimates for unpaid claim liabilities, unearned premium and other estimated liabilities (technical reserves) and certifications
- Insurance product premium pricing
- Surrender value calculations
- Management of pooled savings products, such as with profits
- Reinsurance program design and management
- Underwriting policy definitions
- Life groups underwriting
- Solvency calculations and reports
- Internal modeling, including stochastic asset-liability modeling
- Strategic asset management and capital management
- Value management (embedded value)
- Corporate strategy and planning and control management, including mergers and acquisitions

**b. Health insurance, public health and healthcare management****i. Topics that apply to all lines**

- Product development, pricing, product management, premium adjustments, marketing and competition studies from all stakeholder's perspectives
- Underwriting and reinsurance
- Modeling, profit testing, reserving (including with-profit attributions), solvency calculations, embedded value, financial forecasts and controls
- Catastrophic claim, reinsurance, stop-loss insurance and high-risk pool analysis
- Calculation of reserve for long term guarantee provisions
- Calculation of implicit debt

**ii. Topics that are health specific**

- Health utilization, benchmarking and cost trend forecasts
- Health risk status analysis and revenue risk adjustment
- Disease management return on investment and predictive modeling
- Medical provider reimbursement analysis, including provider capitation, financial incentives and episode payments

- Population disease prevalence forecasts
  - Medical device, pharmacy and new technology efficiency studies
  - Behavior change studies related to health issues
  - Wellness and preventive care impact studies
  - Evidence based treatment protocols
- c. Private pensions and other employee benefits**
- Advice to stakeholders on the design of occupational pension schemes and other long term employee benefits
  - Funding requirements of occupational pension schemes and other long term employee benefits
  - Solvency requirements of occupational pension schemes
  - Internal modeling, including stochastic asset-liability modeling
  - Strategic asset management
  - Evaluation of pension liabilities involved in mergers and acquisitions
  - Design and cost early retirement incentive schemes
- d. Social insurance and other similar benefits**
- Reporting the projected financial status of a Social Security Plan (SSP)
  - Statements of opinion on SSP policy matters (e.g. adequacy of contributions)
  - Calculations concerning actuarial aspects of benefits (for instance, commutation functions if this is permitted, or annuity rates in notional defined-contribution SSPs)
  - Production of numbers for inclusion in the formal financial reports of the SSP
  - Production of short-, medium- and long-term projections of the finances of the SSP for wider government budgeting purposes
  - Management of or input into the investment of the assets of a SSP, including asset-liability management
  - Calculating Implicit Health Liabilities (IHL)
  - Projecting the cost of welfare benefits for widows and orphans, etc.
  - Costing unemployment benefits
- e. Enterprise Risk Management (ERM)**
- Responsibility for the risk management/CRO function
  - Advising on setting company risk appetite and risk limits
  - Creation of financial condition reports
  - Building company risk models
  - Evaluating impact of acquisition on risk profile
  - Performing stress tests

- Identifying and planning for emerging risks
  - Valuation of risks and risk interaction
  - Valuation of risk mitigation solutions
  - Execution of risk mitigation programs
  - Reporting on ERM programs to investors and rating agencies
- f. Other financial services**
- Design and pricing of financial products (in particular more complex products such as those based on derivatives)
  - Analysis of investment performance
  - Building internal models of the business
- g. General roles**
- Various support functions for different stakeholders, i.e. ministry of health, regulators, supervisors, expert witness services, hospitals, medical professions, etc.
  - Providing advice to regulators and legislators
  - Representing employer, employee groups or unions, or serving as an expert witness before court litigations
  - IT-Development, establishment and management of datasets
  - Energy pricing
  - Interactions with rating agencies

## Other roles

Note that the opportunity for the potential application of actuarial skills is virtually unlimited. What is listed below includes some things that are done in some regions, but not others.

- a. Life and general insurance**
- More actuarial opinions can be required in more jurisdictions for loss reserves, unearned premium reserves and other estimated liabilities
  - Provide risk management and governance in life with new solvency regulations
  - Expand the role of risk assessment during mergers and acquisitions and other transactions
  - Expand existing roles or develop new roles where the actuary works with auditors and performs the role of 'reviewing actuary'
- b. Health insurance and health care management**
- A greater actuarial function under Solvency II
  - Actuarial controlling and accounting (IFRS II)

- Supporting health and care management activities in private or government affairs (i.e. health reforms)
  - In the private sector, more work with the drug industry and on research
  - In the public sector, pre-funding of healthcare for retirees
- c. Private pensions and other employee benefits**
- Governance and risk management for retirement plans
  - Work with auditors and/or tax advisors
  - Measurement and reporting of other (non-pension) long term incentive plans
  - Cross-border pension schemes
  - Giving advice to individuals who have to make decisions and exercise choices on defined contribution plans/assets
- d. Social insurance and other similar benefits**
- More direct involvement in public policy discussions and decisions
  - More direct line of communication with the asset manager(s) regarding the cash flow requirements of the plan (i.e., the liabilities)
  - Study the effect of changes on individual (representative) beneficiaries to understand how the social security arrangement or amendments to it may affect particular groups, perhaps using micro-level modeling
  - Gather wider input into economic modeling around fiscal sustainability given how often these plans have an extremely significant impact on overall government budgets
- e. Enterprise Risk Management (ERM)**
- Creation of ORSA reports
  - Incorporate a more complex model of human behavior
  - Advise regulators on the identification and treatment of systemic risk
- f. Other financial services**
- Valuation of assets/liabilities
  - Product design and pricing
  - Review/building of internal models
- g. Education**