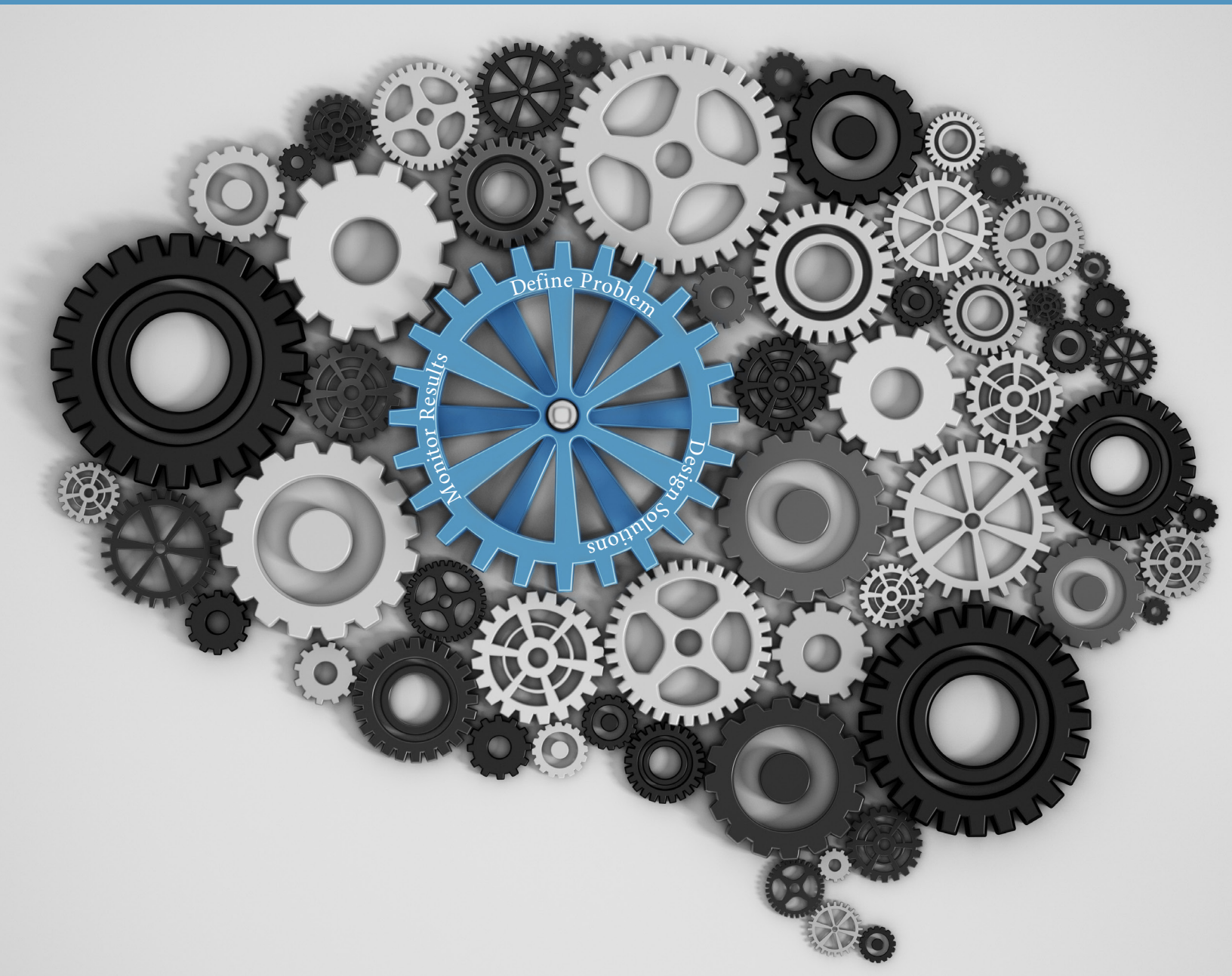
SOCIETY OF ACTUARIES

Fundamentals of General Insurance Actuarial Analysis

Second Edition



- Volume I -

Jacqueline Friedland, FSA, FCIA, FCAS

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VOLUME I

PART 1

INTRODUCTION

Key Learning Objective for Part 1 - Introduction

- Describe the actuarial control cycle.

Important Terminology Introduced in Part 1 - Introduction

- Work, actuarial work
- Actuarial services
- Actuarial control cycle

Part 1 provides a general introduction, describes the organization of the textbook and appendices[1], introduces the naming convention used for many key terms, and outlines the major considerations actuaries take into account prior to and while conducting **actuarial work**.

The International Actuarial Association (IAA) defines the terms **work** and **actuarial services** in its *Glossary of Defined Terms Used in International Standards of Actuarial* Practice. Work is defined as:

> All actuarial activities performed by an actuary related to actuarial services. It usually includes acquisition of knowledge of the circumstances of the assignment; obtaining sufficient and reliable data; selection of assumptions and methodology, calculations, and examination of the reasonableness of their result; use of other persons' work; formulation of opinion and advice; documentation; reporting; and all other communication.[2]

In this textbook, the term "actuarial work" refers to the IAA's defined term "work."

Actuarial services are defined as "services based upon actuarial considerations provided to intended users that may include the rendering of advice, recommendations, findings, or opinions."[3]

[1] The appendices should be considered an integral part of this textbook as they contain examples with critical applications for general insurance actuaries.

[2] https://www.actuaries.org/IAA/Documents/CTTEES_ASC/Final_ISAPs_Posted/FinalGlossary_1Dec2018.pdf, accessed October 8, 2020.

[3] https://www.actuaries.org/IAA/Documents/CTTEES_ASC/Final_ISAPs_Posted/FinalGlossary_1Dec2018.pdf, accessed March 12, 2019.

The processes for projecting ultimate claims, analyzing trends in general insurance (GI)[4], setting reserves for insurance contract liabilities, and determining prices for GI products can be described in the context of the **actuarial control cycle**. The actuarial control cycle is a conceptual framework that is useful for describing the processes required for the successful management of an insurer.[5] It can also be used at a more granular level to describe the processes necessary for managing major actuarial services, such as reserving and ratemaking.[6]

The actuarial control cycle is based on a problem-solving algorithm with three components:

- Define the problem;
- Design a solution; and
- Monitor the results.

The actuarial control cycle is depicted in Figure 1.1.

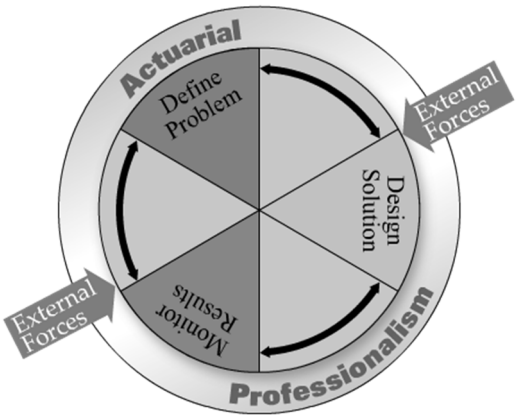

Figure 1.1 Actuarial Control Cycle[7]

Separately and in their entirety, the components of the actuarial control cycle are conducted within an environment of actuarial professionalism and external forces that influence decision-making. The importance of considering actuarial work in the context of a cycle is that the processes are iterative and interconnected. At any time, actuaries may review and repeat the three components of the cycle.

[4] The term "general insurance" and the acronym GI are used for what is also called non-life insurance and property/casualty insurance.
[5] The term "insurer" is used throughout the textbook to indicate an insurance company, reinsurance company, or self-insurer. While the primary focus of this textbook is on the fundamentals of actuarial work for actuaries working with primary insurance companies and self-insurers, the material presented is also relevant for actuaries working with reinsurance companies. The actuarial standards of practice and good practices described are equally applicable to actuaries working with reinsurance organizations.
[6] The terms "ratemaking" and "pricing" are used interchangeably in this textbook.
[7] Copyright Society of Actuaries, used with permission.

In introducing the actuarial control cycle, the authors of *Understanding Actuarial Management: the actuarial control cycle* state:

> What makes the Actuarial Control Cycle distinctly actuarial is the nature of the work carried out at each stage of the cycle. The problem will usually (though not always) involve uncertain future cash flows. The process of defining the problem includes understanding the background, fully identifying all the issues and specifying them clearly to ensure that the client and the actuary agree on the work to be done. The design of a solution will almost always involve modeling. The actuary may have ongoing responsibility for monitoring the experience as it develops and advising on the response, or may seek to build flexibility into the solution.
>
> In this diagram, we include the two components of the environment in which actuarial work is carried out. The actuary has to take account of external forces, such as economic conditions and the commercial setting. Then the whole process operates within the context of Professionalism, which is an inner guide to attitude and practice that governs the actuary in carrying out the work. (Bellis, Lyon, Klugman, & Shepherd, 2010, pp. 3-4)

Throughout this textbook, there are extensive discussions of the obligations of the actuary as set out in the actuarial standards of practice and codes of professional conduct from the major English-speaking actuarial organizations around the world. Furthermore, discussions of good business practices are incorporated into the presentation of numerous topics (such as trend, credibility, and changing environments) as well as many of the examples presented in this textbook.

The actuarial standards of practice presented in this textbook were deliberately selected to reflect what would be considered good practice for actuaries. Quotes addressing similar issues from other jurisdictions could have also been selected. Even if the specific professional standards quoted in this textbook do not apply to the jurisdiction of the reader, the cited standards reflect good practice, and thus the reader should not dismiss them as not applicable to his or her specific jurisdiction.

CHAPTER 1

ABOUT THIS TEXTBOOK

Key Learning Objectives for Chapter 1

- Explain the basic differences between short-term and long-term lines of GI;
- Explain the concept of good practice as it applies to GI actuaries; and
- Identify sources of good practice.

Important Terminology Introduced in Chapter 1

- Long-tail
- Emergence
- Short-tail
- Self-insurer
- Self-insurance fund
- Pooling program
- Captive insurance company (captive insurer, captive)
- Reserves
- Reserving
- Valuation
- Ratemaking, pricing
- Funding analysis
- Good practice, best practice

1.0 INTRODUCTION

This textbook, unlike many other texts on the subject of GI, presents the topics of estimating unpaid claims and pricing together. Projecting the ultimate settlement value of claims and determining trend are two of the primary steps underlying the estimation of unpaid claims and the development of prices for GI products. Thus, a significant portion of this textbook and many of the examples contained herein are directed at projecting ultimate claims and evaluating the trends underlying GI. In each example, the selected values of ultimate claims that are used to determine reserves for financial reporting purposes are also used in the trending procedures and as input to the ratemaking process. In practice, final decisions with respect to pricing would then be incorporated into subsequent analyses for projecting ultimate claims, and the entire process would be repeated. This recurring process is consistent with the actuarial control cycle in which a problem is defined, a solution is designed, and results are monitored all within the context of professionalism requirements and external forces.

1.1 FRAMEWORK FOR THE TEXTBOOK

1.1.1 STRUCTURE OF THE TEXTBOOK

This textbook is organized in two volumes with the following major parts:

Volume I

- Part 1 – introduction;
- Part 2 – key concepts relevant to many types of actuarial work;
- Part 3 – preparing the data;
- Part 4 – projecting ultimate claims, claim-related expenses, and recoveries;
- Part 5 – financial reporting and the establishment of reserves;
- Part 6 – trending procedures;
- Part 7 – ratemaking;
- Part 8 – monitoring;
- References;
- Glossary;
- Commonly used abbreviations; and
- Index.

Volume II

- Appendices A through F – case studies;
- Appendix G – development analysis for excess limits and layers
- Appendix H – Appointed Actuary's questionnaire; and
- References.

1.1.2 EMPHASIS ON THE PRACTICAL

This textbook is developed with the explicit goal of providing a practical guide rather than a theoretical discourse on the subject matter. Examples are embedded within the primary text as well as in the case studies presented in Appendices A through F. Each example begins with a discussion of the data and information available for the specific organization. Data are presented and investigative analyses are performed. For each example, multiple actuarial methodologies are used to project claims at an ultimate settlement value (i.e., ultimate claims). The methodologies produce alternative estimates of ultimate claims that are evaluated before a final selection is made. The selected ultimate claims are then used:

- To determine claim liabilities for financial reporting purposes;
- As input for trending procedures; and
- As input to the ratemaking process.

Examples included in this textbook are constructed to offer detailed illustrations of the processes and methods used in estimating unpaid claims and pricing for a wide variety of GI products offered by diverse insurance organizations.

1.1.3 BASIC VERSUS ADVANCED METHODOLOGIES

The purpose of this textbook is to introduce the fundamentals of GI actuarial work. The methodologies presented are among the principal techniques in use around the world for estimating unpaid claims and developing GI insurance prices. Actuarial approaches for GI are continually evolving and advancing. Many sophisticated techniques, beyond the basic approaches described in this textbook, exist and are in regular use by GI actuaries, particularly for pricing purposes. Emerging technologies (including machine learning, cloud computing, and robotic process automation) are having a significant influence on actuarial work.

1.1.4 PRIMARY INSURERS VERSUS REINSURERS

This textbook focuses on the fundamentals of GI actuarial work related to estimating unpaid claims and conducting ratemaking analyses for primary insurers. The subjects of reserving and ratemaking for reinsurers are outside of the scope of the textbook. That said, there are critical considerations related to reinsurance for actuaries conducting work for primary insurers. Thus, Chapter 10 contains a brief description of reinsurance, key reinsurance terms, the principal functions of reinsurance, the types of reinsurance, and reinsurance contract provisions that affect actuarial analyses.

While reinsurance reserving and pricing are not specifically addressed, virtually everything in this textbook is applicable to actuaries working with reinsurers as well as to actuaries working with primary insurers. Many GI reinsurance actuaries use traditional, basic actuarial methodologies for estimating ultimate claims to determine reserves for financial reporting purposes. Depending on the reinsurance coverage and the availability of data, many GI reinsurance actuaries also use approaches similar to those used for primary insurance, modified as necessary for the circumstances, when pricing GI reinsurance products.

Given the applicability of much of this textbook to actuaries working with reinsurers, the presentation of basic methods for projecting ultimate claims includes commentary at the end of each chapter about differences in considerations and procedures for actuaries working with primary insurers versus reinsurers.

All the discussions regarding professionalism responsibilities and obligations of the actuary are equally applicable to actuaries working with reinsurers. Similarly, the identification and discussion of good practices are equally relevant to GI reinsurance actuaries.

Nevertheless, it is important to highlight that the focus of this textbook is not on actuarial work performed by actuaries working with reinsurers. While many concepts are relevant and applicable to these actuaries, there are nuances in the data and methodologies that do differ between actuarial work for primary insurers and for reinsurers. Actuaries working with reinsurers have a professional responsibility to be aware of these differences and the unique requirements of actuarial work for reinsurance organizations.

1.1.5 GLOBAL PERSPECTIVE

A primary goal of this textbook is to be relevant to actuaries around the world. Thus, it is written with an international focus and contains examples that are intended to be valuable for actuarial

candidates[8] and practicing actuaries globally. This textbook includes references to actuarial literature from numerous countries and extensive citations from the actuarial professional standards of practice and the codes of professional conduct of the major English-speaking actuarial organizations around the world. Draft versions of this textbook were reviewed by actuaries in Australia, Canada, Europe, South Africa, and the United States.

1.1.6 NUMERIC VALUES AND ROUNDING IN EXAMPLES

The claims, premiums, and expenses included in the various examples are typically presented in units of thousands. When values are referenced either in the description of calculations or the findings from different methods, thousands are omitted so that the textual reference is consistent with the numbers in the tables. References to specific currencies are purposefully avoided. The values in the tables in the chapters and the exhibits of the appendices are carried to more decimals than shown; thus, there may be slight differences in some calculations due to rounding.

1.2 LIMITATIONS ASSOCIATED WITH ALL EXAMPLES INCLUDED IN THE TEXTBOOK

The examples contained within this textbook are constructed for the sole purpose of education. The factors, time periods, approaches, assumptions, and ultimately the conclusions presented in this textbook are used to introduce and demonstrate the application of basic methods for actuarial work and are not expected to be applicable for any particular actuarial work or any specific insurer. Instead, actuaries must consider the specific circumstances of the situation, including the issues influencing the internal and external environments, the data available, the characteristics of the portfolio, and any other relevant considerations.

1.3 LANGUAGE AND TERMINOLOGY

The importance of language and a complete understanding of key terminology used by GI actuaries *cannot* be overemphasized. Similar terms are used by many different parties in the GI world to mean very different things; and conversely, different terms are used by many people in the GI world to mean the same thing.

Each chapter in this textbook begins with a summary of the key learning objectives and the identification of key terminology. A complete glossary of all terminology used in this textbook can be found at the end of the textbook following Appendix G – Appointed Actuary Questionnaire.

1.3.1 DEFINITION OF GI LINES OF BUSINESS

To reflect the broad range of products for which actuaries conduct actuarial work, this textbook includes examples for lines of GI characterized as **long-tail** and **short-tail** and for organizations with large and small volumes of experience. Long-tail lines of GI are characterized by the lengthy delay between the period of insurance cover and either the reporting (also referred to as **emergence**) or settlement of the claims, or both; medical malpractice and workers compensation are examples of long-tail lines of GI business. In

[8] Actuarial candidates are also known as actuarial students.

contrast, short-tail lines of GI typically exhibit quick reporting and settlement of the claims. Property insurance is an example of a short-tail line of GI; in many situations, it is only a matter of days or weeks between the time of fire or flood damage and the resultant payment of the property insurance claim.

The names of traditional GI lines of business often vary by country. For example, GI related to automobiles is typically referred to as automobile insurance in the United States and Canada and motor, vehicle, or car insurance in many other countries. Similarly, GI related to personal residential property is known as homeowners insurance in the United States and Canada and home or household insurance in other countries.

In this textbook, the following terminology is used to refer to major GI lines of business:

- *Automobile liability* insurance is a third-party liability (TPL)[9] insurance coverage providing financial protection when an insured is legally liable for bodily injury (BI) or property damage (PD) caused by an insured automobile to a third party. Automobile liability insurance is sold both as a personal lines and a commercial lines GI product.

- *Automobile physical damage* insurance is a first-party insurance[10] that provides financial protection for damage to or loss of an insured's own automobile resulting from collision, fire, theft, vandalism, wind or hail storm, or other perils. In this textbook, two types of automobile physical damage coverage, collision and physical damage other than collision, are differentiated from each other. Automobile physical damage insurance is sold both as a personal lines and a commercial lines GI product.

- *Automobile personal injury protection (PIP)* and *accident benefits* (*AB*) insurance are the names given to the first-party automobile insurance coverage associated with no-fault regimes in the United States and Canada, respectively. PIP and AB insurance provide for medical care and income replacement benefits to an insured injured in a collision regardless of who caused the accident. PIP and AB are sold as part of personal lines and commercial lines automobile insurance.

- *Commercial general liability* (*CGL*) insurance provides financial protection to commercial insureds (including small and large businesses, associations, not-for-profit organizations, and public entities) against TPL claims for BI and PD arising out of premises, operations, products, and completed operations as well as advertising and personal injury (PI) liability. For most liability exposures other than automobile and professional liability, CGL is frequently simply referred to as general liability (GL). In some countries, CGL insurance is known as public liability insurance.

- *Commercial multi-peril* (*CMP*) insurance is the most popular commercial package policy in the United States. Offered to commercial insureds, CMP typically combines several property and liability coverages under a single policy. CMP policies may offer

[9] Third-party liability insurance is purchased by an insured (the first party) from an insurer (the second party) for protection against the claims made against the insured by another (the third) party.
[10] First-party insurance is a policy under which an insured (the first party) is paid by their own insurer (the second party) in the event of an accident, injury, or loss, whether caused by themselves or someone else (a third party).

a combination of crime, commercial automobile and general liability, boiler and machinery, and farm coverages.

- *Directors and officers liability* (D&O) insurance provides protection to directors and officers of corporate entities as well as non-profit organizations against claims alleging financial loss from mismanagement or wrongful acts.

- *Employers' liability* insurance provides coverage against the common law liability of an employer for accidents to and diseases of employees, as distinguished from liability imposed by a workers compensation law.

- *Errors and omissions* (E&O) insurance protects the insured against liability for committing a negligent act, error, or omission in the performance of professional duties; E&O insurance is also known as *professional liability insurance* or *professional indemnity insurance*; it may take on different forms[11] and names depending on the profession. *Legal malpractice* insurance provides coverage to lawyers and others in the legal profession against liability claims arising from acts, errors, and omissions in the delivery of services. *Medical malpractice* insurance provides coverage to doctors and other professionals in the medical field against liability claims arising from acts, errors, and omissions in the treatment of patients. Dentist professional liability, which is a type of medical malpractice insurance for dentist professionals, is one of the detailed examples discussed later in this textbook.

- *Homeowners* insurance protects insureds against financial consequences arising from damages to their home itself and to their possessions in the home; homeowners insurance also provides liability coverage against accidents in the home or on the property.

- *Legal malpractice* insurance (see E&O insurance).

- *Medical malpractice* insurance (see E&O insurance).

- *Product liability* insurance provides protection against claims arising out of the use, handling, or consumption of a product. When product liability insurance is offered as part of a CGL policy, the combined coverage is sometimes called products-completed operations insurance.

- *Property* insurance is a broad category of GI that provides financial reimbursement to the owner or renter of a structure against loss from theft, fire, or other perils to the structure and its contents. Property insurance is either sold on an all risks (open perils) basis or on a named-perils basis, which covers only the perils specified in the policy. Property insurance is sold both as a personal lines and a commercial lines GI product.

[11] Forms refer to the use of claims-made versus occurrence policy terms. In the United States, most E&O coverage is written on a claims-made basis, which provides insurance protection for claims that are reported to the insurer during the policy period. Claims-made and occurrence coverage are described in later chapters of this textbook.

- *Workers compensation* insurance provides income replacement and medical benefits to employees injured in the course of employment in exchange for the mandatory relinquishment of the employees' right to sue the employer for the tort of negligence. U.S. workers compensation insurance includes two types of coverage: Part 1 covers statutory liabilities under workers compensation laws and Part 2 covers an employer's liabilities associated with work-related injuries that are not covered under workers compensation laws.

1.3.2 TYPES OF INSURANCE ORGANIZATIONS

Actuaries perform actuarial work for a broad range of insurance organizations, including insurance companies, reinsurance companies, and self-insured entities. Thus, this textbook includes specific examples to demonstrate common situations experienced by actuaries working with such diverse insurance organizations, including self-insurers. A **self-insurer** is an entity (corporation, association, non-profit organization, or public entity) that retains all or part of the risk for its own account instead of purchasing GI coverage from an insurance company.

Self-insurance can take many forms including:

- Large deductibles and self-insured retentions (SIRs);
- Self-insurance fund;
- Pooling program; and
- Captive insurance company.

Large deductibles and SIRs serve a similar purpose though they differ in the contractual relationship between the insured and the insurer. A deductible and SIR represent the portion of the loss that is not paid by the insurer but is instead retained by the policyholder (i.e., the insured). A **self-insurance fund** is a formal fund established for the purpose of financing retained losses. A **pooling program** is a mechanism in which participants, usually with similar risk profiles (such as municipalities, school boards, or hospitals), join together to manage and finance their liability and property exposures. A **captive insurance company** (also referred to as a captive insurer or simply as a captive) is a licensed insurance company, typically owned and controlled by its insureds, that is established for the primary purpose of providing risk financing to its participants. Captive insurers are typically licensed under special purpose insurer laws and operated under a regulatory system different from commercial insurers. Captive regulation recognizes that captive insurance serves sophisticated insureds and thus less oversight is required on behalf of policyholders than for commercial insurers that serve the general public.

In this textbook, the terms "insurer" and "insurance organization" are frequently used to refer not only to an insurance company (including a reinsurance company) but also to self-insurers. This is particularly true when describing obligations of the actuary as set out by standards of practice and requirements for good practice.

1.3.3 KEY TERMS: RESERVING AND RATEMAKING

The terms "reserving" and "ratemaking" are used extensively throughout this textbook.

Historically, actuaries used the term **reserves** to refer to unpaid claims estimates and unearned premium reserves. The terms **reserving** and **valuation** are often used to refer to the actuarial process of developing estimates of claim liabilities and premium liabilities.[12] The actuarial reserving process includes the collection and review of data, analysis of experience, projection of ultimate claims, selection of ultimate claims, and development of an estimate of unpaid claims that is then booked as a reserve in an insurer's financial statements.

In this textbook, the term "reserves" is limited to its strict definition: an amount booked in a financial statement. Furthermore, in this textbook, the term "reserving" is used only in the context of an actuary's work in selecting among various projections of ultimate claims for the purpose of determining claim liabilities for financial reporting. Reserves for financial reporting include liabilities for unpaid claims (claim liabilities) as well as for the future payment of claims on unexpired GI policies (premium liabilities).[13] In this textbook, the term "estimating unpaid claims" is generally used, rather than reserving, to describe the processes leading up to the final determination of carried reserves. The term "valuation" is also used in this textbook to refer to an actuarial analysis that supports the determination of reserves. For example, there are references in Chapters 24 and 25 to the "valuation of claim liabilities" and the "valuation of premium liabilities."

Ratemaking[14] describes the actuarial processes used in the development of prices for GI products. Ratemaking is typically a prospective task in which historical experience is used to determine rates and rating structures including territorial, classification, deductible, and increased limit rating factors. Rates and rating factors are developed based on an examination of historical experience for GI products that will be sold in the future. For self-insurers, **funding analysis** refers to the actuarial process of determining the costs associated with the retained risks for future periods.

1.3.4 MUST, SHOULD, AND WOULD

When drafting actuarial standards of practice and preparing educational material, the professional actuarial organizations take great care in the choice of terminology. The use of words such as *must*, *should*, *would*, and *may* is very deliberate; some or all of these terms appear as defined terms in actuarial standards of practice. For example, International Standard of Actuarial Practice 1 – General Actuarial Practice (ISAP 1) of the IAA describes must and should as follows:

a. "Must" means that the indicated action is mandatory and failure to follow the indicated action will constitute a failure to comply with the ISAP, unless the departure is due to a conflict with law or code of professional conduct.

b. "Should" (or "shall") means that, under normal circumstances, the actuary is expected to follow the indicated action, unless the departure is due to a

[12] Claim liabilities and premium liabilities are described in the financial reporting section of Chapter 3.
[13] A new accounting framework for insurers, International Financial Reporting Standard 17 (IFRS 17), will become effective on January 1, 2022 for most countries (though not in the United States). Under IFRS 17, insurers will report liability for incurred claims (LIC), which is similar conceptually to claim liabilities, and liability for remaining coverage (LRC), which is similar conceptually to premium liabilities. A detailed discussion of IFRS 17 is beyond the scope of this textbook.
[14] The terms "ratemaking" and "**pricing**" are used interchangeably in this textbook.

> conflict with law or code of professional conduct. However, in all other cases, if following the indicated action would produce a result that would be inappropriate or would potentially mislead the intended users of the actuarial services, the actuary should depart from the guidance and disclose that fact and provide the reason for not following the indicated action.[15]

In Canadian actuarial standards of practice, should is described as the "strongest mandating word … appearing only in recommendations"; and would is described as "a suggestive word … and is less forceful than the mandative 'should'".[16] Furthermore, in Canada, the term "should" is used exclusively for standards of practice and not in educational notes or research papers.

In this textbook, the use of the words must, should, and would is much less rigid. These terms are frequently used to describe an action that is expected or possible as opposed to a professional duty.

1.4 GOOD PRACTICE

Comments about good practice are interwoven in virtually every chapter of this textbook. For actuaries, **good practice** (also referred to as **best practice)** begins with compliance with applicable standards of practice and codes of professional conduct. Good practice also entails adherence with requirements set out for the actuary in applicable law (i.e., statutes, regulations, and other legally binding authority) or accounting frameworks, particularly for the actuary's work supporting financial reporting.

It is challenging to find a precise definition of good practice. Good practice is used to describe a process for developing and adhering to a standard way of doing things that multiple people and organizations can use. Good practice refers to approaches or methods (under given circumstances) that have consistently shown superior results for achieving a specific objective and can thus be used as benchmarks. These approaches and methods, founded through experience and research, are used to maintain high quality within a profession and/or for a particular type of work.

The term "good practice" is often preferred to "best practice" as it is debatable whether or not a single *best* approach or method exists. It is important to recognize that good practice is continually evolving, becoming better as improvements are discovered.

The Swiss Agency for Development and Cooperation states the following about good practice:

> The essence of identifying and sharing good practices is to learn from others and to re-use knowledge. The biggest benefit consists in well-developed processes based on accumulated experience.[17]

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15 https://www.actuaries.org/IAA/Documents/CTTEES_ASC/Final_ISAPs_Posted/ISAP1_Review_adopted_1Dec2018.pdf, accessed October 8, 2020

16 http://www.cia-ica.ca/docs/default-source/standards/sg020118e.pdf, accessed October 8, 2020

17 www.sdc-learningandnetworking.ch/en/Home/SDC_KM_Tools/Good_Practice, accessed March 10, 2013.

This quotation summarizes the purpose of integrating commentary about good practice into the technical material of this textbook. The purpose is to share the experiences of senior actuaries throughout the world, particularly those involved in the standards-setting process, to enhance the educational process of learning about the fundamentals of GI actuarial work.

1.5 CONCLUDING REMARKS

The main objective of this textbook is to teach the fundamentals of actuarial work to future GI actuaries; thus, the subject matter is aimed at a basic level as opposed to an advanced treatment. The focus of the textbook is on the practical rather than the theoretical. As such, it is deliberately written to present the topics in an easily accessible, practical manner with numerous detailed examples illustrating the processes and methods used in estimating unpaid claims and pricing for a wide variety of GI products. Each example contains detailed exhibit titles, column and line headings, and explanations of key assumptions and calculations.

The examples are constructed for educational purposes only. The factors, assumptions, approaches, and conclusions underlying the examples are not meant to be used for any actuarial work. They are presented for the sole purpose of illustrating basic actuarial methods underlying actuarial work for insurers.

The actuarial control cycle is embedded directly into the examples, thus demonstrating the connection between the estimates of ultimate claims for reserving purposes and for the development of GI rates. Relevant actuarial standards of practice from around the world as well as sound business practices are incorporated into the discussion of actuarial work.

Finally, the textbook is prepared to be international in its focus. A goal of this textbook is to be meaningful for practicing actuaries around the globe, in a language that is accessible to all, regardless of whether or not English is one's first language.