Underwriting Principles and Controls

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Chapter 1 UNDERWRITING BACKGROUND AND OBJECTIVE

Basically, underwriting consists of two components; risk assessment and pricing. Successful underwriting requires a system of risk selection to obtain a group in which loss results will be reasonably predictable by means of the law of averages. To accomplish this goal there must be a balance between obtaining volume and obtaining homogeneous risks. If an insurance company issuing individual life policies, for instance, adopted such strict standards that it would only accept individuals who were practically perfect physically, ideal from a moral standpoint, and in risk-free occupations, there would be only a very small group from which to choose. Such a group would be very homogeneous, with all the risk units--in this case the individual lives--subject to about the same chance of loss. But the mass or volume of risk units would be very small, and thus the predictability of loss might be adversely affected. Another element entering in to make selection of such a group impractical would be that selection procedures necessary to obtain this near-perfect set of individuals. The expense involved would more than offset the savings from the mortality rate of the group. In underwriting, selection expense is a factor to be considered. There has to be a balance between the strictness of selection standards and the necessity of having a large volume of risk units to be insured.

For example, group life insurance selection standards are set up to achieve this balance. Usually group insurance companies adopt selection standards broad enough to permit acceptance of the large majority of insurable risks at standard premium rates. Certain groups employed in hazardous occupations will have mortality rates consistently higher than standard risks. They have to be classified as substandard risks and a policy covering them would have a higher premium rate. A risk may even be rejected entirely because the mortality rate is too great or too unpredictable for insurance to be practicable. The chance of loss is never exactly the same for all risks or groups, even within the classification of insurable risks into the standard class and several substandard classes. In each class there are good risks and poor risks relative to the rest of the class.

Underwriter’s Goal

It is the goal of the insurance underwriter to establish rules which will result in securing an average proportion of good risks. If the underwriter can accomplish this goal, the company's average mortality cost will be lower and the company may be able to offer insurance at a lower net cost. The practice of experience rating helps in achieving this goal. The rules adopted by various companies to secure the desired result will vary, based as they are on the individual company's experience, research, judgment, and, at the end, intuition. But the aims they are trying to achieve are basically the same. For successful operation in the insurance field, the rules established by any company need to achieve the proper balance between mass and homogeneity of risks to achieve predictability of future results. The rules should establish standards permitting acceptance of the large majority of risks at standard premium rates. They need to

secure the largest possible proportion of the average risks within each classification. In order to achieve this proportion, a company may establish a policy of accepting borderline cases which would not be a gain from the underwriting standpoint but would provide volume to spread out overhead expense.

The objective of underwriting is to produce a pool of insureds, by categories, whose actual loss experience will closely approximate the expected loss experience of a given hypothetical pool of insureds. That is, if an underwriter is told that a pool of exposures with specified characteristics (e.g., a pool of brick buildings located no more than 5 miles from a fire station) will produce a specified loss rate of, say, 1% of the value of the insured property, then the underwriter should try to place in this pool all the exposures whose characteristics match the specifications. If the underwriter does the job well, the loss ratio of the insureds accepted will closely approximate the expected 1% figure. Putting applicants for insurance in the classification or pool that most closely reflects the real costs of their losses is the essence of good underwriting. Contrary to some opinions, it is not the function of the underwriter to reject so much business that the company experiences no losses. If the underwriter rejects all but the exceptionally safe exposures, he or she has probably turned away much desirable business. The insurance company expects a certain number of losses to occur, and it is just as much an underwriting error to reject profitable business as it is to accept loss-prone business.

Financial Function

The function of the underwriter is to accept applicants so that the losses paid by the insurance company closely match the losses that the company expects to pay. The potential for conflict between the underwriter and the insurance agent must be considered. The underwriter's performance is judged primarily on the *quality,* rather than the quantity of successful applications produced, whereas the agent is compensated based on *quantity* of production. The conflict between the two parties is more apparent than real. The agent's responsibilities include an initial screening of applicants. If the agent knows a company will not accept a certain class of business, such applications should not be submitted. The underwriter knows that the greater amount of business accepted, the better the law of large numbers will operate. Furthermore, the agent knows that, if the applications submitted consistently result in an above-average number of claims, the company may wish to terminate its relationship. Thus, while a potential for conflict appears because of the different objectives of the underwriter and the agent, in practice they are both working toward the same goal-producing a large group of properly classified insureds.

Purpose of Underwriting

The purpose of underwriting is to develop and maintain a profitable book of business for the insurer. A book of business is all of the policies that an insurer has in force or some subgroup of those policies. For example, a book of business can include all of an insurer's commercial policies or all of its commercial general liability policies. "Book of business" can also refer to business produced in a specific geographic area or by a particular branch office or agency.

For underwriting to achieve its purpose, insurers must minimize the effects of adverse selection. Adverse selection occurs because the individuals and businesses with the greatest probability of loss are those most likely to purchase insurance. For example, persons and businesses owning property in a flood plain are generally much more interested in buying flood insurance than applicants who do not own property in a flood

plain. Insurers, on the other hand, are not interested in selling insurance to applicants who expect frequent, severe losses. Underwriters minimize the effects of adverse selection by carefully selecting the applicants whose loss exposures they are willing to insure.

Underwriting Process

Underwriting has been defined as determining what loss exposures will be insured, for what amount of insurance, at what price, and under what conditions. To make an underwriting decision, there are six steps:

1. Evaluating loss exposures- the gathering of information about an applicant's loss exposures. There is a tradeoff between the need for information and the cost to obtain it.
2. Determining underwriting alternatives-
3. Selecting an underwriting alternative
4. Determining the appropriate premium
5. Implementing the underwriting decision
6. Monitoring the loss exposures

Although experienced underwriters do not always follow each of these steps in strict sequence, the sequence of steps provides a sound framework for underwriters to make decisions. For example, as each piece of information is received, the underwriter considers how that information will affect the available alternatives. Likewise, if the underwriter receives information clearly indicating that the applicant is unacceptable, he or she immediately "implements the decision" to reject the account.

1.) Evaluating Loss Exposures- In this step information is gathered about an applicant's loss exposures. Underwriters must understand the activities, operations, and character of every applicant. However, tradeoffs are necessary to control underwriting expenses and to handle a reasonable number of applications. Underwriters weigh the need for information against the cost to obtain it. For example, an underwriter is likely to thoroughly investigate a manufacturing facility whose raw material is petroleum products. Not quite so much information is needed for a retail facility in the local strip mall.

2.) Determining underwriting alternatives- Each alternative is carefully evaluated. The underwriter must choose the optimal one under the applicable circumstances. The three underwriting alternatives are:

- Accept the submission as is.
- Reject the submission.
- Make a counteroffer to accept the submission subject to certain modifications. Four major types of modifications, discussed next, are as follows:

  a.) Require loss control measures to reduce hazards- Some loss control measures are relatively inexpensive and simple to implement, while others, such as fire sprinklers, require considerable capital investment.

  b.) Change insurance rates, rating plans, or policy limits- A submission that is not acceptable at standard rates might be desirable if the underwriter can charge a different rate, use a different rating plan, or provide a different limit. A rate modification could either increase or decrease the premium. Smokers will not get the best life insurance rates while a preferred risk program might be presented to a

desirable applicant who applies for coverage at standard rates.

c.) Amend policy terms and conditions- A submission might become acceptable by modifying the policy to exclude certain causes of loss, add or increase a deductible, or make another coverage change.

d.) Use facultative reinsurance- If the applicant is in a class of business that is not covered by the underwriter's reinsurance treaty, or if the amount of insurance needed exceeds net treaty capacity, the underwriter might be able to transfer a portion of the liability for the applicant's loss exposure to a facultative reinsurer.

3.) Selecting an underwriting alternative- The underwriter must decide whether to accept the submission as offered, accept it with modifications, or reject it. Rejection is sometimes unavoidable; however, rejections produce neither premium nor commission, only expense. Therefore, underwriters try to make the submission acceptable because one of the insurer's goals is to produce profitable business.

4.) Determining the appropriate premium- Underwriters must ensure that each loss exposure is properly classified so that it is properly rated. Insurance loss costs are typically based on an elaborate classification system in which similar loss exposures are combined into the same rating classification. Combining loss exposures into rating classifications enables the insurer to appropriately match potential loss costs with an applicant's particular loss exposures. Consequently, the insurer can develop an adequate premium to pay losses and operating expenses and to produce a profit. Accurate classification ensures a pooling of loss exposures whose expected loss frequency and loss severity are similar. Misclassification can produce adverse results, including insufficient premium to cover losses and expenses, inability to sell policies because prices are higher than competitors' prices, and charges that the insurer has violated regulations prohibiting unfair trade practices.

5.) Implementing the underwriting decision- Implementing underwriting decisions generally involves three steps:

a.) Contact the producer (and others involved) with the decision, good or bad. If the decision is to accept the submission with modifications, the reasons must be clearly communicated to the producer or applicant, and the applicant must agree to accept or implement the modifications. If the application is rejected, a clear and logical reason why the particular applicant does not meet the insurer's underwriting requirements must be communicated.

b.) Put coverage into effect. Issue a binder, send a policy worksheet to the policy unit, or prepare certificates of insurance.

c.) Record the policy and the applicant information for accounting, statistical, and monitoring purposes. Data entry personnel enter essential information into the insurer's information system. It must be coded so that the insurer and the industry can evaluate and accumulate information on all accounts for ratemaking, statutory filing, and financial accounting.

6.) Monitoring the loss exposures- After an underwriting decision has been made on a new business submission or a renewal; the underwriter must monitor activity on the individual policies to ensure that satisfactory results are achieved.

Historical Development of Underwriting

The word "underwriter" stems from the manner in which the first contracts for insurance were written. Most experts agree that the first insurance contracts were property insurance covering sailing vessels and their contents. The typical maritime insurance contract insured against several perils-such as fire and storms-which could cause the ship's owner to lose the ship or its contents. These contracts also stipulated the amount that the owner would receive from the insurer as compensation in the event of such a loss. The first insurers were individuals who agreed to assume someone else's risk for a mutually agreed upon price. These individuals endorsed the contract under the signature of the party purchasing the insurance coverage and thus became known as "underwriters:' Life insurance underwriting also originated in connection with maritime insurance, when insurance coverage was purchased to cover the lives of merchants and captains traveling on insured ships.

Traditional Underwriting Practices

During most of insurance history, underwriting was an art which was passed down from one underwriter to another. In the process, a body of traditional practices developed based on experiences with claims. Losses of a certain type, even though infrequent, indicated patterns which needed careful attention. For example, over the years, the underwriter might notice accidents in automobiles which were caused by drivers with physical impairments. Perhaps they were driving cars without proper equipment to compensate for their impairments, or perhaps they were not trained to use the equipment which was installed.

From experiences such as these, the underwriter gradually developed guides to types of risks which presented more problems than normal. When a class of risks was identified through long experience as being somewhat of a problem, it was natural for the underwriter to place the class on an unacceptable list. Underwriters recognized that there probably were acceptable risks within each class, but they felt that the efforts required to identify those risks were not justified by the few additional policies which could be written. Investigation, which would be needed to find the acceptable risks, was expensive and there were pressures on the expense ratio. More importantly, underwriters were unsure how to identify the few desirable risks. It seemed more logical to refuse to write all members of the class than to spend money trying to find the few who might qualify. Exceptions were made, but they were relatively rare, and usually based on strong recommendations of the producer.

This is the way that class underwriting developed. Based largely on the accumulated experience of underwriters, class underwriting was supported by the few statistics which became available, such as those which showed that past accidents and citations were predictors of future accident involvement. Underwriters then prepared lists for the guidance of producers and new underwriters, showing the classes which were not desirable. Various names were used for these guide lists, such as prohibited list, non-binder list, restrictive list and ineligible list. (The latter was used before the development of the current distinction between "ineligible," meaning a risk which cannot be written under the company's filings, and "unacceptable," meaning a risk which the underwriter cannot find a way to write even though it is eligible. Today there are both ineligible and unacceptable lists, but the term "ineligible" formerly included both of them.)

Little Information Available

The first life insurers had very little information to support their assumptions regarding the possibility or probability of loss of life. They relied solely on their own judgment to determine both the standards of insurability used to evaluate proposed insureds and the price to charge for the risks they insured. If an individual did not meet an insurer's standards for insurability, the individual would not be granted coverage. Later, when small groups of entrepreneurs formed insurance companies, the consensus of the members of the life company's board of directors replaced the individual underwriter's judgment, although there was still no body of quantitative mortality experience to guide the directors in their decisions. In 1725, London Assurance took a significant step in the development of professional underwriting when it told its soliciting agents, "You are to learn, if possible, the reason why the assurance is [sought], for unless there are good reasons...the person assured may be in a worse state of health than you apprehend."

By the middle of the eighteenth century, insurance companies were using mortality statistics to establish more reliable premiums. At this time, actuaries, who had expertise in the statistical methods used to formulate mortality rates, usually performed the underwriting. However, since actuaries did not have sufficient medical experience to evaluate an individual's physical condition, many companies began to employ physicians to assess the health of proposed insureds. Since most reasons for declining a risk were medical, these physicians performed most of the underwriting, with the actuary handling only nonmedical factors, such as hazardous occupations. The mortality tables used by early life insurers reflected the mortality of both insured and uninsured individuals. These early tables were not really suitable for evaluating insurance risks, since insured and uninsured individuals experience different mortality rates. This difference is a result of the selection process performed by the insurance company. Persons in poor health usually are not granted coverage. Those granted coverage are healthier and, therefore, experience lower mortality rates.

Rating Process Systematized

With the advent of mortality tables based on the mortality of insured lives, companies realized that they were rejecting many people who could be insured if an extra premium were charged for certain impairments. As companies developed more experience at the practice of charging extra for certain impairments, the number of impaired individuals that could be insured with an extra premium charge increased. However, companies that adopted this approach found that they needed to account for varying degrees of mortality risk and to establish consistent standards for underwriting impaired applicants. Of the many methods developed to meet this need, the numerical rating system has been the most universally accepted and is the most widely used today.

In 1919, Arthur H. Hunter and Dr. Oscar H. Rogers, the actuary and medical director, respectively, of the New York Life Insurance Company, introduced the **numerical rating system.** Based on statistical studies of the mortality rates of groups of people with various conditions, Hunter and Rogers identified various characteristics that affected mortality and assigned each characteristic a positive or negative numerical value representing its favorable or unfavorable impact on mortality. Those characteristics which had a positive impact on mortality were termed credits, and those which had a negative impact were termed debits. The numerical rating system soon became firmly established and provided insurers with a standardized method for

charging adequate and equitable premiums to individuals who were believed to have a mortality rate higher than standard. The numerical rating system eliminated to a considerable extent the subjective underwriting judgment involved in the classification of both average and higher-than-average mortality risks. This system is still used today.

Use of the numerical rating system also led to the practice of using personnel who were neither actuaries nor physicians to evaluate applications for insurance. Initially, company doctors assigned the debits and credits. Companies learned, however, that much of this task could be performed just as easily and more economically by "lay underwriters" working from established rating guidelines. At the same time, the growth of the insurance industry presented the problem of how to handle an increasing volume of business. In addition, most applications were on individuals who were standard risks and who, therefore, did not require extensive evaluation. The use of a lay underwriter provided a solution to both problems: the evaluation of various nonmedical risk factors, which had been previously performed by the actuary, was also delegated to a lay underwriter, usually one of the underwriting department clerks.

This transition to having lay underwriters -rather than physicians and actuaries-evaluate proposed insurance risks was the beginning of the underwriting function as it exists today. Lay underwriters -who now performed many of the underwriting tasks which had previously been the responsibility of either the actuary or the company doctor-usually reported to the company doctor, who in turn reported to the actuary. This situation has continued to the present day with some modifications. Most applications now are evaluated by lay underwriters. However, great progress is being made in understanding the nature, treatment, and effect on mortality of many diseases. The effect of this progress is that the medical assessment of substandard mortality risks is more accurate and the underwriter may consult more often than before with the company's medical department.

Underwriter Responsibilities

Underwriters must review applications for insurance and then either accept at an appropriate rate or reject the application. This person makes a decision based on criteria established by the company's management (for example, no drivers accepted under age 21 or no insurance on commercial property) and on personal experience and judgment. In practice, the underwriter must be a skillful judge of people. He or she must judge the applicant for the insurance in every instance. If the morals of the applicant are open to question, the underwriter probably will decline the insurance, no matter how sound the property or how healthy the life.

The underwriter must be very alert to the possibility of adverse selection. Adverse selection, sometimes called "antiselection," describes the process whereby those individuals more than likely to experience loss try to purchase their insurance at average rates that do not truly reflect the above-average cost of their exposure. The underwriter who does not select applicants carefully will soon find the actual loss experience well above the expected experience based on predictions of insuring an average group. If there has been adverse selection, the group of insureds will no longer be average. People whose property is prone to fire, those who are more than likely to have automobile accidents, and people whose health is not good need the financial security that insurance can provide. In many instances, insurance companies

legitimately accept such exposures. But when such applicants are accepted they must be charged a premium that reflects the increased costs of such exposures. To accept such nonstandard risks at standard rates would mean that the standard risks are subsidizing the nonstandard risks. Such a situation can result in the collapse of the insurance company. Recognizing that the possibility of adverse selection is always present, the underwriter must carefully screen and rate all applications for insurance. Proper classification of risks, and dealing with potential adverse selection, is the essence of the underwriter's assignment.

Potential for Conflict

The potential for conflict between the underwriter and the insurance agent must be considered. The underwriter's performance is judged primarily on the *quality,* rather than the quantity of successful applications produced, whereas the agent is compensated based on *quantity* of production. The conflict between the two parties is more apparent than real. The agent's responsibilities include an initial screening of applicants. If the agent knows a company will not accept a certain class of business, such applications should not be submitted. The underwriter knows that the greater amount of business accepted, the better the law of large numbers will operate. Furthermore, the agent knows that, if the applications submitted consistently result in an above-average number of claims, the company may wish to terminate its relationship. Thus, while a potential for conflict appears because of the different objectives of the underwriter and the agent, in practice they are both working toward the same goal-producing a large group of properly classified insureds. In fact, experienced underwriters have frequently told me that in underwriting marginally acceptable exposures, it is the submitting agent's historical performance that may determine the acceptance of an application.

Types of Underwriters

Insurers commonly distinguish between line underwriters and staff underwriters.
Line underwriters are primarily responsible for implementing the steps in the underwriting process. Line underwriters are generally located in insurers' branch or regional offices.
Staff underwriters assist underwriting management with making and implementing underwriting policy. Staff underwriters are typically located in an insurer's home office.

Line and staff underwriting activities sometimes overlap. For example, staff underwriters might be directly involved in individual underwriting decisions for large or unusual accounts. Whether to accept a large or an unusual account, and on what terms, sometimes requires a decision by staff underwriters or top management about how that particular account fits with the insurer's overall underwriting goals.

Line Underwriters

In addition to their primary responsibilities in implementing the steps in the underwriting process, line underwriters also engage in the following activities:
Assisting with determining appropriate coverage
Providing service to producers and policyholders
Assisting With Determining Appropriate Coverage

An underwriter can offer valuable technical assistance to the insured's risk manager and the producer who is directly responsible for determining what coverage best meets the insured's needs. For simple or routine submissions, the underwriter verifies that the policy is issued with the appropriate forms and endorsements. For complex or unique submissions, the underwriter might draft manuscript policies and endorsements based on the characteristics of each submission.

An underwriter's knowledge of insurance policy forms and ability to relate policy provisions to the loss exposures of individual policyholders or applicants benefits producers and applicants. For example, suppose an applicant requested insurance on the loss exposures of a manufacturing location. While reviewing the applicant's operations as described in the inspection report, the underwriter discovers that the applicant has a loss exposure to property in transit that would not be covered adequately by the coverage forms. The underwriter discusses this loss exposure with the producer and offers to provide the coverage in an inland marine policy, thereby broadening the insured's coverage.

Sometimes an underwriter must narrow an insured's coverage. Producers often request broader coverage for the loss exposures of a particular applicant than the insurer is willing to provide. Rather than decline the application, the underwriter might offer a more limited form of coverage involving higher deductibles or covering fewer causes of loss. The producer has an opportunity to provide reduced coverage that might be acceptable to the applicant rather than reject the applicant altogether.

Providing Service to Producers and Policyholders

Line underwriters also provide services to both producers and policyholders. Line underwriters prepare premium quotations and assist producers with proposals. Once a quote has been accepted, the underwriter prepares the file for the policy writing or data entry department. Line underwriters also answer telephone calls, e-mails, and correspondence promptly; and process cancellations, endorsements, certificates, and renewals in a timely manner. The skill and efficiency with which line underwriters provide technical assistance, prepare quotations, issue policies, and perform routine services contribute to the insurer's success.

Staff Underwriters

Staff underwriters usually work at the insurer's home office, and they perform the following tasks:
Researching the market
Researching and developing coverages
Evaluating underwriting experience
Reviewing and revising rating plans
Formulating underwriting policy
Developing underwriting guides
Conducting underwriting audits
Assisting with education and training
Researching the Market

Insurers must continually research fundamental issues such as which markets the

insurer should target. Staff underwriters typically share these research responsibilities with actuarial and marketing departments. This research includes an ongoing evaluation of the following:
Effect of adding or deleting entire types of business
Effect of expanding into additional states or retiring from states presently serviced
Optimal product mix (the composition of the book of business, such as the percentage of premium generated by general liability or workers compensation policies)
Premium volume goals

Developing Coverages

Staff underwriters modify the insurer's preprinted policy forms and endorsements to reflect changes in market conditions or state regulations. Staff underwriters might also serve on industry or association committees that study standard policy forms and recommend changes.

Conducting Underwriting Audits

An underwriting audit is a management control tool used to determine whether line underwriters are properly implementing underwriting policy. Typically, a staff underwriter or a team of staff underwriters visits a branch or regional office and reviews individual underwriting files. The audit focuses on proper documentation; adherence to procedure, classification, and rating practices; and conformity of selection decisions to the underwriting guide and bulletins. Staff underwriters also monitor underwriting activity by analyzing statistical results by type of insurance, class of business, size of loss exposure, and territory. Statistical data show the extent to which underwriting goals are met, but they do not conclusively demonstrate whether the results are a product of implementing the insurer's underwriting guidelines. Staff under, writers also conduct field audits to ensure compliance with the insurer's underwriting guidelines.

Assisting With Education and Training

Staff underwriters are usually responsible for determining the educational needs of line underwriters. The training department implements the resulting training program and continuing educational activities. If an educational need involves a technical insurance area, staff underwriters often develop the course and serve as instructors.

Evaluating Underwriting Experience

To discern trends, staff underwriters analyze the loss and premium data of their own companies' books of business and of the insurance industry by type of insurance, class, size of loss exposure, and territory. That analysis is then used to determine whether changes must be made in the insurer's marketing or underwriting strategies. The necessary changes are usually communicated through the underwriting guide, but sometimes underwriting bulletins address special situations.

Reviewing and Revising Rating Plans

Rates and rating plans must be reviewed and updated continually-subject to regulatory constraints-to respond to changes in loss experience, competition, and inflation. The review and update must occur whether the insurer develops rates independently or uses the services of an advisory organization. Advisory organizations assist insurers with gathering the data necessary to calculate rates. Examples include Insurance

Services Office (ISO), the American Association of Insurance Services (AAIS), and the National Council on Compensation Insurance (NCCI). Most advisory organizations develop historical and prospective loss costs that they file with the appropriate regulatory authorities. Each insurer examines its own operational costs and profit requirements and combines them with loss costs to create its final insurance rates. For those coverages for which advisory organizations do not develop loss costs, the insurer must develop its own rates. In such situations, reviewing and revising rating plans become even more crucial.

Formulating Underwriting Policy

Staff underwriters try to formulate an underwriting policy that effectively translates the goals of an insurer's owners and management into rules and procedures that guide individual and aggregate underwriting decisions. Underwriting policy determines the composition of the insurer's book of business. Goals for an insurer's book of business might be established by types of insurance and classes of business to be written; territories to be developed; or forms, insurance rates, and rating plans to be used.

An insurer's underwriting policy is influenced by management's desired position in the insurance marketplace. Most insurers see their role as standard insurers-that is, they seek better-than-average accounts. Some insurers, however, see an opportunity to offer coverage in areas that are underserved by the standard market. These nonstandard or specialty insurers might use loss control, more restrictive coverage forms, or higher prices to make a profit insuring accounts considered marginal or unacceptable in the standard market. Underwriting policy is always being reviewed and it is subject to these limitations:

1. Financial capacity
2. Regulation
3. Personnel and physical resources
4. Reinsurance

The following sections describe each of these constraining factors and illustrate how they affect underwriting policy changes.

Financial Capacity

Insurers must prudently use their limited financial capacity to write business. Sometimes, the insurer might decide to stop writing a type of insurance or to add a type not previously written to optimize its allocation of scarce capacity. For example, a particular class of general liability insureds might be experiencing a level of losses that exceeds the level anticipated by the rate. Therefore, the insurer might decide to stop pursuing that class of business and, instead, use capacity to increase the volume of commercial property insurance. Alternatively, the insurer might decide to limit its writing of a given type of insurance in a particular territory. In the past, for example, inadequate rate levels and rising benefit levels for claimants in many states led some insurers to develop restrictive acceptance criteria for workers compensation submissions. In establishing underwriting policy, underwriters must also consider the possible effect of a catastrophic loss simultaneously affecting many types of insurance.

Regulation

The insurance industry is highly regulated, and insurance regulation constrains underwriting policy. Insurers must obtain licenses to write insurance by individual types of insurance within each state. They must file rates, rules, and forms with state regulators. Some states, such as Florida, specifically require underwriting guidelines to be filed. In response to consumer, group complaints, regulators sometimes focus their attention on insurance availability in geographic areas that consumer groups believe the insurance industry has not adequately served. Regulators perform market conduct examinations to determine whether insurers adhere to the classification and rating plans they have filed. When a market conduct examination discloses deviations from filed forms and rates or improper conduct, the insurer is subject to penalties. The effect of regulation on underwriting policy varies by state. In some states, insurers might be unable to get rate filings approved or approval might be granted so slowly that rate levels are inadequate in relation to rising claim costs. Insurers sometimes withdraw from jurisdictions where they believe regulation is too restrictive.

Personnel and Physical Resources

Personnel limitations can also constrain underwriting policy. An insurer must have enough properly trained underwriters to implement its underwriting policy. No insurer, for example, should pursue aviation, equipment breakdown, or ocean marine insurance unless it has enough underwriting specialists experienced in those types of insurance. In addition to having personnel with the necessary skills, the insurer must have the personnel *where* they are needed. All other things being equal, premiums should be obtained from a broad range of insureds to create the widest possible distribution of loss exposures. However, regulatory expenses and policyholder service requirements make it difficult for small insurers to efficiently handle a small volume of business in many widespread territories. Even if people are available, an insurer cannot handle business without the necessary physical resources.

Reinsurance

Reinsurance is an arrangement in which a company, the reinsurer, agrees to indemnify an insurance company, the ceding company, against all or a portion of the primary insurance risks underwritten by the ceding company under one or more insurance contracts. The reinsurance practice is close to the insurance practice. The main differences stem from a greater complexity due to a wider diversity of activities and from an international practice. Reinsurance can provide a ceding company with several benefits, including a reduction in net liability on individual risks and catastrophe protection from large or multiple losses. Reinsurance also provides a ceding company with additional underwriting capacity by permitting it to accept larger risks and write more business than would be possible without a concomitant increase in capital and surplus. Reinsurance, however, does not discharge the ceding company from its liability to policyholders. Reinsurers themselves may feel the need to transfer some of the risks concerned to other reinsurers, in a procedure known as retrocession.

Functions

Reinsurance provides three essential functions:

1. Reinsurance helps to stabilize direct insurers' earnings when unusual and major

events occur, by assuming the high layers of these risks or relieving them of accumulated individual exposures;
2. Reinsurance allows insurers to increase the maximum amount they can insure for a given loss or category of losses, by enabling them to underwrite a greater number of risks, or larger risks, without burdening their need to cover their solvency margin, and hence their capital base;
3. Reinsurance makes substantial quantities of liquidity available to insurers in the event of major loss events.

Types of Reinsurance

Contracts of reinsurance are described as being either treaties or facultative certificates. This, of course, is a simplistic view. Reinsurance agreements are difficult to categorize because reinsurance contracts become more complex depending on their use. The focus of this commentary is on more standard risk transfer reinsurance mechanisms and the terms used for these contracts.

In **treaty reinsurance**, the ceding company is contractually bound to cede and the reinsurer is bound to assume a specified portion of a type or category of risks insured by the ceding company. Treaty reinsurers, do not separately evaluate each of the individual risks assumed under their treaties and, consequently, after a review of the ceding company's underwriting practices, are dependent on the original risk underwriting decisions made by the ceding primary policy writers.
Such dependence subjects reinsurers in general, to the possibility that the ceding companies have not adequately evaluated the risks to be reinsured and, therefore, that the premiums ceded in connection therewith may not adequately compensate the reinsurer for the risk assumed. The reinsurer's evaluation of the ceding company's risk management and underwriting practices as well as claims settlement practices and procedures, therefore, will usually impact the pricing of the treaty.

In facultative reinsurance, the ceding company cedes and the reinsurer assumes all or part of the risk assumed by a particular specified insurance policy. Facultative reinsurance is negotiated separately for each insurance contract that is reinsured. Facultative reinsurance normally is purchased by ceding companies for individual risks not covered by their reinsurance treaties, for amounts in excess of the monetary limits of their reinsurance treaties and for unusual risks. Underwriting expenses and, in particular, personnel costs, are higher relative to premiums written on facultative business because each risk is individually underwritten and administered. The ability to separately evaluate each risk reinsured, however, increases the probability that the underwriter can price the contract to more accurately reflect the risks involved.

Proportional and Non-Proportional Reinsurance

Both treaty and facultative reinsurance can be written on a proportional, or pro rata, basis or a non-proportional, or excess of loss or stop loss, basis.

Proportional

Proportional reinsurance (mostly known as quota share reinsurance) is where the reinsurer takes a stated percent share of each policy the insurer writes and then shares in the premiums and losses in that same proportion. The size of the insurer might only allow it to write a risk with a policy limit of up to $1 million, but by purchasing proportional reinsurance it might double or triple that limit. Premiums and losses are then shared on a pro rata basis. For example an insurance company might purchase a 50% quota share treaty; in this case they would share half of all premium and losses with the reinsurer. In a 75% quota share, they would share (cede) 3/4th's of all premiums and losses. The reinsurance company usually pays a commission on the premiums back to the insurer in order to compensate them for costs incurred in sourcing and administering (e.g. retail brokerage, taxes, fees, home office expenses) the business (usually 20-30%) This is known as the ceding commission.

The other (lesser known) form of proportional reinsurance is surplus share. In this case, a “line” is defined as a certain policy limit - say $100,000. In a 9 line surplus share treaty the reinsurer could then accept up to $900,000 (9 lines). So if the Insurance Company issues a policy for $100,000, they would keep all of the premiums and losses from that policy. If they issue a $200,000 policy, they would give (cede) half of the premiums and losses to the reinsurer (1 line each). If they issue a $500,000 policy, they would cede 80% of the premiums and losses on that policy to the reinsurer (1 line to the company, 4 lines to the reinsurer 4/5 = 80%) If they issue the maximum policy limit of $1,000,000 the Reinsurer would then get 90% of all of the premiums and losses from that policy.

Non-proportional

In the case of reinsurance written on excess of loss basis or excess of loss, the reinsurer indemnifies the ceding company against all or a specified portion of losses and LAE, on a claim by claim basis or with respect to a line of business, in excess of a specified amount, known as the ceding company's retention or reinsurer's attachment point, and up to a negotiated reinsurance contract limit.

Although the frequency of losses under a pro rata reinsurance contract is usually greater than on an excess of loss contract, generally the loss experience is more predictable and the terms and conditions of a pro rata contract can be structured to limit aggregate losses from the contract. A pro rata reinsurance contract therefore does not necessarily require that a reinsurance company assumes greater risk exposure than on an excess of loss contract. In addition, the predictability of the loss experience may better enable underwriters and actuaries to price such business accurately in light of the risk assumed, therefore reducing the volatility of results.

Risk Sharing

Many reinsurance placements are not placed with a single reinsurer but are shared between a number of reinsurers. Excess of loss reinsurance is often written in layers. One or a group of reinsurers accepts the risk just above the ceding company's retention up to a specified amount, at which point another reinsurer or a group of reinsurers

accepts the excess liability up to a higher specified amount or such liability reverts to the ceding company. For example a $30,000,000 excess of $20,000,000 layer may be shared by 30 reinsurers with a $1,000,000 participation each) The reinsurer who sets the terms (premium and contract conditions) for the reinsurance contract is called the lead reinsurer; the other companies subscribing to the contract are called following reinsurers (they follow the lead).

The reinsurer taking on the risk just above the ceding company's retention layer is said to write working layer or low layer excess of loss reinsurance. A loss that reaches just beyond the ceding company's retention will create a loss for the lower layer reinsurer, but not for the reinsurers on the higher layers. Loss activity in lower layer reinsurance tends to be more predictable than that in higher layers due to a greater historical frequency, and therefore, like pro rata reinsurance, better enables underwriters and actuaries to more accurately price the underlying risks.

About half of all reinsurance is handled by Reinsurance Brokers who then place business with reinsurance companies. The other half is with “Direct Writing” Reinsurers who have their own production staff and thus reinsure insurance companies directly.

Premiums payable by the ceding company to a reinsurer for excess of loss reinsurance are not directly proportional to the premiums that the ceding company receives because the reinsurer does not assume a direct proportionate risk. In contrast, premiums that the ceding company pays to the reinsurer for pro rata reinsurance are proportional to the premiums that the ceding company receives, consistent with
the proportional sharing of risk. In addition, in pro rata reinsurance the reinsurer generally pays the ceding company a ceding commission. The ceding commission is usually based on the ceding company's cost of acquiring the business being reinsured (commissions, premium taxes, assessments and miscellaneous administrative expense) and also may include a profit factor for producing the business.

Retrocession

Reinsurance companies themselves also purchase reinsurance and this is known as a retrocession. They purchase this reinsurance from other reinsurance companies, who are then known as “retrocessionaires.” The reinsurance company that purchases the reinsurance is known as the “retrocedent.”

It is not unusual for a reinsurer to buy reinsurance protection from other reinsurers. For example, a reinsurer which provides proportional, reinsurance capacity to insurance companies may wish to protect its own exposure to catastrophes by buying excess of loss protection. Another situation would be that a reinsurer which provides excess of loss reinsurance protection may wish to protect itself against an accumulation of losses in different branches of business which may all become affected by the same catastrophe. This may happen when a windstorm causes damage to property, automobiles, boats, aircraft and loss of life.

This process can sometimes continue until the original reinsurance company unknowingly gets some of its own business (and therefore its own liabilities) back. This is known as a “spiral” and was common in some specialty lines of business such as marine and aviation. Sophisticated reinsurance companies are aware of this danger and through careful underwriting attempt to avoid it.

It is important to note that the insurance company is obliged to indemnify their policyholder for the loss under the insurance policy whether or not the Reinsurer actually reimburses the Insurer. Many insurance companies have gotten into trouble by purchasing reinsurance from reinsurance companies that did not or could not pay their share of the loss. This is a genuine concern when purchasing reinsurance from a reinsurer that is not domiciled in the same country as the insurer. Losses come after the premium, and for certain lines of casualty business (e.g. asbestos or pollution) the losses can come many, many years later.

Broker vs. Direct Reinsurance

Reinsurance can be written through professional reinsurance brokers or directly from ceding companies. From a ceding company's perspective, both the broker market and the direct market have advantages and disadvantages. A ceding company's selection of one market over the other will be influenced by its perception of such advantages and disadvantages relative to the reinsurance coverage being placed. For example, broker coverages usually involve a number of participating reinsurers that have been assembled by a broker, each assuming a specified portion of the risk being reinsured. A ceding company may find it easier to arrange such coverage in a difficult underwriting environment where risk capacity is constrained and reinsurers are seeking to limit their risk exposure. In contrast, direct coverage is usually structured by ceding companies directly with one or a limited number of reinsurers. The relative amount of brokered and direct business written varies according to local market practice.

Specialty Features of Reinsurance Contracts

It's not uncommon for captive reinsurance contracts to include specialty features such as contingent profit commissions and swing premium calculations. As their names imply, these contract features can enable a reinsurer to share profitability on a program back with the captive. Obviously, captive owners get excited about the possibility of sharing in the profitability of the business they generate, but the programs are also beneficial to the reinsurers in that they help promote long-term business partnerships. The advantage of contingent profit commissions is that they generally don't penalize the captive for a poor underwriting year. In an unprofitable year, the captive simply doesn't get a commission. However, for purposes of the calculation, the reinsurer may carry forward underwriting losses to a subsequent year pursuant to a "deficit carry forward" provision in the contract. Also, it's important to note that if loss experience (which includes the liability for incurred but not reported losses-IBNR) turns unfavorable in subsequent years, it is possible that a captive can record a loss relating to the contingent commission program as prior year profits generated are reversed from earnings. Lastly, accounting guidance requires that companies book anticipated earnings on profit commissions on a full accrual basis. Therefore, if the contract calls for

cash settlements at some future date-say in years three through eight after the close of the contract year-the earnings on the contingent commission may precede the cash receipts. If the captive is a tax payer, this may create a larger than expected tax bill.

Chapter 2 DEVELOPING UNDERWRITING CRITERIA

Staff underwriters communicate an insurer's underwriting policy to line underwriters and others by developing underwriting guides and related bulletins. Underwriting guides describe the practices necessary to implement underwriting policy. Staff underwriters periodically update the guides to reflect changes in policy. The underwriting guides that staff underwriters prepare identify the major elements that line underwriters should evaluate for each type of insurance.

Guideline Development

Underwriting guides help to ensure that underwriting policy-and therefore selection decisions-are made uniformly and consistently throughout all geographic regions. These guides also synthesize the insights and experience of seasoned underwriters and help the less experienced ones. Underwriting guides also distinguish routine from nonroutine decisions. Some underwriting guides include step-by-step instructions for handling particular classes of insureds. Such guides might identify specific hazards to evaluate, alternatives to consider, criteria to use when making the final decision, ways to implement the decision, and methods to monitor the decision. The guides might also provide pricing instructions and reinsurance-related information. Here are examples of underwriting guidelines for property/casualty insurance-

Underwriting Guideline Examples

21st Century Insurance Co. Commercial Auto Guidelines

No coverage is bound until you receive written confirmation from SAIS.
Please read and understand these guidelines. If you have any questions, please contact your underwriter.
Incomplete applications will be declined.

ACCEPTABILITY

Our Commercial Automobile Program prefers the service and retail business owners, artisans and service contractors, with light and medium vehicles. We will write any size account or any size vehicle.

We do not insure:

Taxis; buses; street rubbish trucks; ice cream vendors; pizza deliveries; ambulances; active police or fire vehicles; explosive, L.P.G. or nuclear waste haulers; Unless incidental to another business: tow trucks and limousines; General truckers hauling anything, anywhere, at any time for anyone; Limited production, kit, handcrafted autos or vehicles with an ACV over $ 100,000.

Underwriter approval is necessary to submit Sand & Gravel haulers, couriers, messenger services, security guards, catering hot trucks, steel haulers, express delivery businesses, hazardous material

handlers.
All other business types are eligible for consideration but may be declined for a combination of negative attributes.

ADDITIONAL INSUREDS

Additional Insureds: Must be requested on a separate memo. Do not request on a certificate. **You have no authority to issue additional insured endorsements.** We will issue upon request.
Additional insureds that may increase the Company's exposure may be surcharged, i.e., picking up a contractual liability exposure to the additional insured. Contractual Liability Endorsement request will result in a surcharge of 5% of the liability premium.
Adding additional insureds increases the cost of defense and exposure and takes processing time.
The charge for these endorsements will be as follows:

Additional Insured Endorsements Premium	
3 to 6	$ 50.00
7 to 10	$ 100.00
11 to 15	$ 200.00
16 +	$ 300.00

When a higher number is reached during the policy term, the difference will be added to the policy. i.e. goes from 6 to 7, + another $ 50.00.

APPLICATIONS

Please use the Acord Business Auto Application.
This application **MUST BE COMPLETE AND THE APPLICATION MUST HAVE:**
1) All drivers' names and license numbers;
2) A copy of the VEHICLE REGISTRATION FOR EACH VEHICLE (or complete VIN and license number);
3) Past Insurance Carrier and Policy # & Loss History;
4) **Description of the Business and USE OF THE VEHICLES;**
5) Insured's phone # and name of person to contact for inspection;
6) ESTIMATED ANNUAL MILEAGE; and
7) PAPER DOCUMENTATION FOR ANY CREDIT applied, (Credits are subject to our approval).
8) No application can be quoted with just a post office box.

AUDIT

The company has the option of auditing the insured's records to determine the correct premium.

AUTOS

Autos are rated as:
a) Work / Pleasure; b) Commuter; or c) Business. We will rate all autos as business autos unless we have a satisfactory explanation why they are a) or b).
Do not rate SUVs, Jeeps, Utility Type Vehicles, or Vans as Autos (THEY MUST BE RATED AS LIGHT TRUCKS.)
Target Autos: With a cost new of $60,000 + may not be bound for physical damage. Submit only.
Will not write: Limited production, kit, handcrafted, cost new $100,000+ autos.
Any vehicle considered high performance or exotic is not eligible without special consent by the underwriter.
Insurance Service Office (ISO) stopped using auto performance symbols i, h, s & p. They now use 1, 2, 3 & 4. Vehicles with these letters or numbers must be submitted to us for rating. They are considered target autos. Now i = 1, h = 2, s = 3, p = 4.

CANCELLATIONS

No flat cancellations (except where insured's check for the down payment is dishonored or proof of duplicate coverage is provided). Policies NOT accepted by the insured due to an uprate and returned to us postmarked within 15 days of the date of issuance will be canceled pro rata.
Return premiums, if any, will be canceled on a short-rate basis unless cancellation is by CNIC or a finance company. An insured's signed request or lost policy release is required.
All premiums for each coverage will be rounded to the nearest whole dollar.

CATERING

(*Special application required*)
Catering hot trucks must have workers' compensation coverage. However, if the insured is both cook and driver or there are no other drivers other than a husband and wife and both are named insureds, this requirement may be waived. Insured cannot require a driver, sub-leasee or cook to contribute to the payment of any worker's compensation insurance (violates the insurance code).
Maximum comp and collision coverage is $ 35,000 for catering trucks. Adjusted based on Actual Cash Value (ACV).
If more coverage is needed, proof of a higher value must be submitted by the insured or broker and there will be an increase in premium.

CLAIMS

Please report all losses the day you are notified and urge your insureds to contact us directly.
Brokers may not assign claims to adjusters.
Please call the Claims Department at 800-733-1980 or fax to 800-430-4221.
Claims reported by phone must be followed by written notice.
All claims correspondence requiring a reply must be immediately reported to Claims.

****$ 100.00 OFF COLLISION DEDUCTIBLE****
If the insured reports the claim to us in less than 4 hours after the accident, $ 100.00 will be deducted from their collision deductible.

COVERAGE

LIMITS AVAILABLE
Liability: Physical Damage:

Split Limits	Combined Single Limits	Deductible	Medical Payments	Uninsured Motorist Coverage
	50,000	***$250***	***$1,000***	***$15,000 / 30,000***
$50 / 100 / 25	***100,000***	***$500***	***$2,000***	***$25,000 / 50,000***
$100 / 300 / 50	***300,000***	***$1,000***	***$5,000***	***$30,000 / 60,000***
$250 / 500 / 100	***500,000***	***$2,500***		***$50,000***
	600,000	***$5,000***		***$60,000***
	750,000			***$50,000 / 100,000***
	1,000,000			***$100,000***

SURCHARGES

Surcharges may be applied up to 25% in addition to any other surcharges, in an additive manner, to one or more vehicles on the account. The surcharge may be applicable to the whole account or to individual vehicles, dependent upon applicability. Surcharges will apply only to Liability, Comprehensive and Collision coverage unless noted.

1) Owners of the business do not take an active part in management. Owners/managers have not previously been in this business.

2) Loading and unloading of the vehicle that creates an unusual exposure to parties other than insured drivers. Applied to liability premium only.

3) Vehicles have a dual purpose beyond the normal business use, i.e., used for desert recreation on weekends.

4)The operation of the vehicle while immobile creates additional risk not contemplated by ordinary road use,
i.e., cranes, cherry pickers, any other custom alteration that causes a stationary exposure. Using equipment
on the vehicle in an unusual manner that increases exposure, not contemplated in ordinary road use. Applied
to liability premium only.

5) Trailers or equipment hauled or pulled by a vehicle that insured wants covered that by its pulling or use,
creates additional exposure, i.e., trailer that pumps cement, or pulverizes tree limbs, carries hot tar or other
substance that may cause injury, or extraordinary clean-up costs, hauls unsafe loads or double or triple
trailers. This surcharge is applied to the liability premium of the trailer only.

6) Off-road use that creates additional exposure.

7) Trailer or vehicle that is used for office or other occupancy, i.e., mobile medical trailer, dog washing, library, anything where people may come and go to and from. Applies to liability premium only, of the unit
involved.

8) Deleting an exclusion on the policy at the request of the insured and on agreement by the Company. Not to
exceed one exclusion. Applicable only to the premium coverage affected.

OTHER SURCHARGES

New Venture Surcharge

Proprietors that have not been in the business described on the application for 6 months are classified as a new venture. New ventures will be surcharged 10% on ***Liability coverage***. At renewal, the surcharge will be dropped. If, on renewal, the account is not eligible for experience rating and the loss ratio exceeds ***50%***, the surcharge will remain for one more year, which will give the insured more business experience and time to control losses and refine their business practices. Lack of prior insurance can be an element of proof of a new venture. Insured must explain why they did not have prior insurance if they were in business, or they may be classified as a new venture.

MILEAGE

If the insured's stated estimated annual mileage exceeds (applied only to the vehicle designated):
50,000 10%
60,000 15%
70,000 20%

DEFINITIONS

Service Use: Vehicles used for transporting the insured's tools or equipment to a job location and remaining there for some period of time to do their work, i.e., artisans, backhoe operators, landscapers, etc.

Commercial Use: Everything not defined as service use is considered to be for commercial use except autos and certain special categories.

Weight Definitions:

Light Truck GVWR up to 10,000 lbs.

Medium Truck GVWR 10,001 to 20,000 lbs.

Heavy Truck I GVWR 20,001 to 25,000 lbs.

Heavy Truck II GVWR 25,001 to 30,000 lbs.

Heavy Truck III GVWR 30,001 to 45,000 lbs.

Extra Heavy Truck I GVWR 45,001 to 60,000 lbs.

Extra Heavy Truck II GVWR 60,001 to 80,000 lbs.

Extra Heavy Truck III GVWR 80,001 +

DRIVERS

There is a penalty for an unreported driver with 3 or more points that is involved in an accident. Reported or unreported drivers are covered for liability unless excluded.

All drivers of vehicles covered under this policy must be reported by the insured to the company, prior to inception of or renewal of the policy. If a person becomes a driver during the policy period, said driver must be reported to the company prior to driving a vehicle on this policy.

IMPORTANT!

If the insured **does not report a driver** as required above, and the unreported driver has ***3 to 5 points***
on his/her MVR **at the time of an accident, there will be a $1,000 Collision Deductible in addition to any other Collision Deductible.**
If there is no Collision Coverage on the vehicle involved, there will be a $1,000 Liability Deductible in addition to any other Liability Deductible.
If the insured does not report a driver as required above, and the unreported driver has *6 or more points* on his/her MVR at the time of an accident, the *Collision Deductible will be tripled*. If there is no Collision Coverage on the vehicle involved, there will be a $2,500 Liability Deductible in addition to any other Liability Deductible.

Insured acknowledges that it is in the best interest of the insured and the Company to hire good drivers
and will check the MVRs on any driver allowed to drive a vehicle insured with the company.
The above rules DO NOT APPY TO an infrequent driver of a PRIVATE PASSENGER AUTO, who
is not an insured employee or family member of an employee or insured.

EQUIPMENT ON VEHICLES

We must be advised of added equipment not original to the vehicle. **The value of the equipment must be stated separately** from the vehicle. If it is not, the added equipment IS NOT COVERED. A premium must be charged for added equipment or it is not covered. EACH ADDED EQUIPMENT VALUE MUST BE STATED SEPARATELY, BUT THE TOTAL VALUES WILL BE ADDED TOGETHER TO CALCULATE THE RATE. A clear description of the added equipment including value and serial numbers is to be provided. Coverage will be provided by separate endorsement.
The premium is 4% times the value of the equipment.
The loss will be adjusted on the separately stated values, at the actual cash value thereof, cost to repair or replace, or the stated amount whichever is LESS. IF NOT SEPARATELY STATED, IT IS NOT COVERED.
Remember, SERVICE BODIES are ADDED EQUIPMENT, also 4 x 4's, fancy painting, racks, shells, tool boxes, signs, stripes, winches, and ANYTHING NOT FACTORY ORIGINAL TO THE VEHICLE IS ADDED EQUIPMENT AND MUST BE SEPARATELY STATED TO BE COVERED.

EQUIPMENT NOT ON VEHICLES
(CN562)

Backhoes, Forklifts or similar equipment:
Maximum physical damage coverage: $10,000. Premium: 5% of stated value. Losses will be adjusted on
ACV. Stated value is just to establish premium.
Maximum liability coverage: $ 100,000.
Two types of coverage:
1) Operation on street only. Premium: 40% of service light truck rate.
2) All operations. Premium: 75% of the service light truck rate.

FILINGS

MCPA (DMV) filings, no surcharge.
The BIPD premium will be surcharged 5% for filings such as: form E, DTSC filing, or any existing or future filing with similar effect, language or exposure increase. Special applications must be completed before any of these filings may be made. When renewing policies with these filings, the renewal application must be received with sufficient time (at least 10 days before expiration) to allow sufficient time to renew the filing with the appropriate government entity. SR 22 filings should be placed with the insured's personal auto policy.

MOTOR CARRIER PROPERTY ACT filings (MCPA)
CALIFORNIA ONLY

Motor carriers of property need a minimal limit of $ 750,000.
Generally any vehicle over 10,000 GVWR
Vehicles less than 10,000 lbs. that fall under the MCPA need $ 300,000.
We must have the CA number before a filing can be made.
BROKER MAY NOT BIND TRUCKS FOR HIRE OR HEAVY TRUCKS WITHOUT UNDERWRITER APPROVAL, or make any filing. Submit only. Not ratable on FSC.
Trucks for hire are rated at the maximum established distance that they travel, (if we condescend to write them), generally 500 miles, unless it is documented that they have a route that is less than 500 miles.

INSPECTIONS

We inspect most accounts. Please advise your insured and request their cooperation with the inspection.
Applications must contain a name and phone number for the inspector to contact.

RADIUS

We prefer the local haul accounts that do not exceed 100 miles. However, rates are available for all distances. Any account that exceeds a 100-mile radius may be submitted but may not be bound. There is no coverage restriction for radius.

Other Types of Underwriting Guides

Other insurers use underwriting guides that are less comprehensive. For example, they might list all classes of business and indicate their acceptability by type of insurance. Codes are then assigned to indicate the desirability of the loss exposure and the level of authority required to write the class of business.

Life Insurance Underwriting Guidelines

This table provides general underwriting guidelines for term life insurance. **A rating class is determined through each individual companies underwriting process.**

Health Issue	Super Preferred	Preferred	Standard Plus	Standard
Family History	No cardiovascular disease or cancer in either parent or siblings prior to age 60.	No death from cardiovascular disease or cancer in either parent or siblings prior to age 60.	Not more than one parent death from cardiovascular disease or cancer prior to age 60.	Not more than one parent death from cardiovascular disease or cancer prior to age 60.
Cholesterol / HDL Ratio	May not exceed 5.0	May not exceed 6.0	May not exceed 7.0	May not exceed 8.0
Cholesterol Level	May not exceed 220	May not exceed 250	May not exceed 280	May not exceed 300
Blood Pressure	No history of treatment. May not exceed 140/85.	Currently controlled. Current and historic readings over last two years may not exceed 150/90	Currently controlled. Current and historic readings over last two years may not exceed 150/90	Currently controlled. Current and historic readings over last two years may not exceed 150/95
Alcohol / Substance Abuse	No history.	No history in the past 10 years.	No history in the past 7 years.	No history in the past 7 years.
Driving History	No DUI, DWI or reckless driving in the past 5 years. No more than 2 moving violations in the last 3 years.	No DUI, DWI or reckless driving in the past 5 years. No more than 3 moving violations in the last 3 years.	No DUI, DWI or reckless driving in the past 3 years. No more than 3 moving violations in the last 3 years.	No DUI, DWI or reckless driving in the past 2 years. No more than 3 moving violations in the last 3 years.
Aviation	Commercial airline pilots are allowed. Private pilots may be allowed with an exclusion rider.	Commercial airline pilots are allowed. Private pilots may be allowed with an exclusion rider or extra premium.	Commercial airline pilots are allowed. Private pilots may be allowed with an exclusion rider or extra premium.	Commercial airline pilots are allowed. Private pilots may be allowed with an exclusion rider or extra premium.
Hazardous Avocation	Not available.	May be available with extra premium.	May be available with extra premium.	May be available with extra premium.
Residence and / or Citizenship	Must be a U.S. resident for the past 3 years. Must be a US citizen or have permanent Visa.	Must be a U.S. resident for the past 3 years. Must be a US citizen or have permanent Visa.	Must be a U.S. resident for the past 3 years. Must be a US citizen or have permanent Visa.	Must be a U.S. resident for the past 3 years. Must be a US citizen or have permanent Visa.
Military	No active duty.	May be on active duty.	May be on active duty.	May be on active duty.
Foreign Travel	No travel to countries under State Department Advisory.	No travel to countries under State Department Advisory.	No travel to countries under State Department Advisory.	No travel to countries under State Department Advisory.

Underwriting worksheet

For a particular insurance case, a document that contains records of telephone calls and other communications, documentation of requests for reinsurance, underwriting requirements and other information requested, and other notations that explain clearly the manner in which the case has been handled from the time it was submitted to the insurer.

XYZ Insurance Underwriting Worksheet

General Information	
Company:	
Street Address:	
City:	
State:	Zip:
Web address:	
Your name:	
Phone:	
Email address:	
Products:	
Year founded:	
Prior losses:	

Financial Information	
Ownership:	☑ Public ☐ Private (if private, complete this section)
Money raised YTD:	
VC Firm(s) involved:	
Business plan:	☑ Available ☐ Unavailable

Exposure Information	
Number of employees:	
Est. domestic sales:	(or payroll)
Est. Foreign Sales:	(or payroll)
Operations type:	Office
Construction type:	Concrete T/U
Sprinklers:	☑ Yes ☐ No
Central Station:	☑ Yes ☐ No
Burglar Alarm:	☑ Yes ☐ No
Year built:	
Biohazard level:	☑ 1 ☐ 2 ☐ 3
Animal facility:	☑ Yes ☐ No

Est. downtime:	
Monthly burn rate:	
Property Limits	
Building:	
PP, EDP, PPO:	
BI:	
CBI:	
AOL:	
Transit:	
	Max/Avg values
	Number of trips
	Exhibition
	Annual number
R & D:	
Crime:	
Property deductible:	

Chapter 3 OVERVIEW OF LIFE/HEALTH UNDERWRITING

The acceptance of a proposed insured for either life or health insurance coverage involves a transfer of risk from the insured to the insurance company. By purchasing a life insurance policy, a person substitutes a small, certain loss -the life insurance premium -for a larger, uncertain loss -usually the beneficiary's loss of future economic support due to the early death of the insured. In this way, insurance coverage transfers the risk of financial loss due to the premature death of the insured individual from the policyowner or named beneficiary to the life insurance company. The process used to determine an individual's probable degree of risk of loss is called underwriting. In order to provide insurance coverage on an equitable basis, insurers charge each insured a premium rate that corresponds to the risk that person presents to the company. Thus, someone with a higher risk-for life insurance purposes, a higher risk of death, and for health insurance purposes, a higher risk of accident or illness -pays a higher premium than someone with a lower risk.

In order to control the risk assumed by the company and to provide insurance coverage on an equitable basis, insurance companies systematically select and classify individual applicants according to the degree of risk they represent. Underwriting is the process of assessing an individual's anticipated mortality -that is, the relative incidence of death among a given group of people -or morbidity -that is, the relative incidence of sickness or disease among a given group of people-in order to determine (1) whether to approve that person for insurance coverage and, if so, (2) the risk classification to which the proposed insured should be assigned. The home office underwriter decides whether

and on what basis a proposed insured is insurable according to the company's established underwriting standards.

The Underwriting Decision

In making risk assessments and assigning proposed insureds to the appropriate risk classes, the home office underwriter's objectives are to approve and issue a policy that is fair to the buyer, deliverable by the agent, and profitable to the company.

Equitable to the Client

One of the basic principles of insurance is that each individual insured should pay a premium that is proportionate to the amount of risk the company assumes for that person. As each application for insurance is received, the insurance company must determine the degree of risk and must charge a fair premium for this risk. Analysis of a group of individuals of a particular age and sex indicates a wide variation in physical condition, occupation, avocations, and other factors. For example, in a group of one hundred 35-year-old men applying for $50,000 of life insurance coverage, perhaps ninety-eight are in good health and two have a serious health impairment that is likely to increase their risk of early death. If all one hundred men paid the same amount for their insurance coverage, the ninety-eight healthy ones would be subsidizing the higher risk represented by the two men in poor health. Such an arrangement would not be equitable. Therefore, the men with a higher risk of early death should be charged a higher life insurance premium than the others. This principle holds true for any impairment that causes an individual to have a higher risk of loss than other individuals of the same sex and age. An understanding of how various factors influence mortality enables the underwriter to identify applicants who present comparable mortality risks and to classify these applicants accordingly. Classifying insureds in this way enables the insurance company to charge each individual policyowner an equitable premium proportionate to the degree of mortality risk he or she presents to the company.

Deliverable by the Agent

The buyer makes the ultimate decision as to whether a particular insurance policy is acceptable. If the buyer chooses not to accept the policy when the agent attempts to deliver it, that policy is said to be undeliverable, or not taken. One of many reasons a policy may be considered not taken is because of an unfavorable underwriting decision that results in a higher-than-anticipated premium charge. For example, if the underwriter has decided to charge a higher-than-normal premium for the coverage or to limit the amount or type of supplemental benefits or riders applied for, then the proposed insured may reject the policy. For a policy to be acceptable to the buyer, it must satisfy three basic requirements:

1. The policy must provide benefits that meet the buyer's needs.
2. The buyer must be able to afford the cost of coverage.
3. The premium to be charged for the coverage must be competitive in the marketplace.

The third requirement listed above is particularly important because the life insurance industry is very competitive, especially in the area of pricing. The price that agents quote to their clients is generally based on the company's standard premium rates. Agents may have difficulty delivering the issued policy to a client if the underwriter's decision has made the policy more expensive than the premium rate that the agent originally quoted to the buyer. When such is the case, agents may exert pressure on the underwriter or on company management to lower the price. If the company does not

yield, the agents may take their business to a competitor that offers a more deliverable product. When agents attempt to put pressure on an underwriter and no change in the decision is possible, the underwriter must be able to explain the reasons for his or her adverse decisions with enough credibility that the agent will continue to sell insurance for the company.

Profitable to the Company
Finally, an underwriter must make decisions which will be profitable to the company. All insurance companies, whether stock, mutual, or fraternal, require sound underwriting to assure favorable financial results. Stock companies pay dividends to stockholders and, in some cases, policyowners, while mutual and fraternal insurers pay dividends to policyowners. Surplus should grow in all companies if they are to continue to fulfill their economic role. The profitability of an insurer is, to a large extent, built into the rate structure established by its actuaries. Although underwriters are not directly involved in establishing a company's premium structure, underwriters' decisions are very important in producing actual mortality results that coincide with the actuaries' mortality projections.

Establishing Risk Classes

By using available statistics on mortality, a life company actuary establishes a number of different categories -known as risk classes -to accommodate the varying degrees of risk presented by groups of individual insureds. A **risk class** is a group of insureds who present an equivalent mortality risk to the insurance company. The underlying concept involved in pricing any insurance product is that past mortality experience can be used to predict future mortality experience-
If a large enough number of people apply for insurance, and
If these people can be placed within relatively homogeneous groupings for the purpose of developing a premium structure.

A schedule of premium rates for life and health insurance is based on the assumption that the future mortality and morbidity rates anticipated by the actuary and those rates actually experienced by the company will generally be comparable to past mortality and morbidity rates. This assumption will generally hold true if individuals who exhibit similar degrees of risk are grouped together in large enough numbers for the laws of probability to operate. The different risk classes used by life companies are the standard, substandard, preferred, and nonsmoker classes.
Standard- This class includes individuals whose anticipated mortality is regarded as average.
Substandard There are usually several of these classes in an insurer’s rating scheme. They include individuals with **impairments** -that is, any aspect of their health, occupation, activities, or lifestyle that can be expected to shorten their life spans.

Preferred- There may be some overlap between the preferred, or superstandard, class and the nonsmoker class. Both classes include individuals whose anticipated mortality is lower than standard mortality. The **nonsmoker** class, however, uses only one factor-whether an individual smokes, usually cigarettes-to determine .whether that individual is a better-than-average mortality risk. The **preferred** class, on the other hand, is based on many factors in addition to whether the proposed insured smokes. Many companies use nonsmoker risk classes; fewer use preferred risk classes. Most proposed insureds

are accepted for coverage; only about two percent of all applicants are declined for coverage.

Underwriting Guidelines

Important features of good underwriting is consistency. Consistency is necessary for two main reasons-

1.) Consistency in underwriting is necessary if the underwriter is to achieve the mortality results projected by the actuary.
2.) Members of the company's field force need consistent underwriting so they can predict to some degree the underwriting decision on individual applications, especially in cases involving impaired risks. Thus, the agent can take applications from proposed insureds with realistic expectations about the probable underwriting decision.

In order to assure consistent underwriting and to achieve the mortality results assumed in the actuary's premium calculations, underwriters follow guidelines based on the company's rate structure and financial objectives. These guidelines use the numerical rating system as the basis for suggested underwriting actions and are summarized in the company's underwriting manual.

The Numerical Rating System

The numerical rating system is a method of assigning numerical values to individual proposed insureds based on the degree of risk they present to the insurer. These numerical values are then used to determine the appropriate risk class in which to place each insured and the corresponding premium to charge. The numerical rating system assigns a positive or negative numerical value to a number of characteristics that have been determined to have a positive or negative impact on the mortality risk presented by individuals. The numerical value of the average, or standard, mortality risk is set at 100, indicating 100 percent of standard mortality. Those characteristics with a favorable effect on mortality have "minus" values and are called credits. Those characteristics with an unfavorable effect on mortality have "plus" values and are called debits. The sum of these debits and credits plus the basic standard value of 100 represents the numerical value of the risk presented by an individual applicant. The numerical rating an applicant receives determines his or her risk classification. The higher the numerical value, the higher the degree of risk presented by the proposed insured. For example, if a study of a certain group of overweight people showed the mortality rate for the group to be 150 percent of the mortality rate for average risks, or 50 percent higher than average, each member of this overweight group would be given a debit of +50.

The Underwriting Manual

The numerical rating system is a generalized method of assigning relative values to life insurance risks. The values individual companies assign to life insurance risks vary from company to company because of variations in expected mortality results. An **underwriting manual** in this context is a summary of the method used by a particular company to evaluate and rate risks. The underwriting manual provides background information on impairments and serves the underwriter as a guide to suggested underwriting action when various impairments are present. Most companies emphasize, however, that the suggested actions listed in their underwriting manuals are intended to

be flexible and may be modified by the underwriter according to individual circumstances. Because the preparation of underwriting manuals presupposes extensive experience with various types of risks and impairments, reinsurers and a few of the largest direct insurers were the first producers and users of underwriting manuals. Initially, reinsurers also supplied underwriters in their ceding companies with the manuals free of charge in an effort to assure that the ceding company's underwriters adhered to the reinsurer's underwriting standards. This arrangement provided the direct insurers with the benefit of a larger base from which to draw experience and spared them the cost of preparing, publishing, and updating the manuals.

The typical underwriting manual contains several sections. The major portion of the manual discusses common medical impairments. For each impairment listed, the manual provides descriptive material and suggested ratings. Each underwriting manual also includes an index, which lists synonyms and derivative terms for impairments and corresponding page references. Most manuals also include a laboratory section which lists basic laboratory test data and a "normal" range of values for the most commonly used laboratory tests. Many manuals also have additional sections which provide suggested ratings for nonphysical impairments, and include a glossary of symptoms and medical terms, as well as a list of medical and insurance abbreviations and definitions, to help the underwriter interpret medical information.

Rating Manuals

Underwriting manuals vary in comprehensiveness from encyclopedic manuals that include extensive background information on impairments as well as suggested ratings to more concise manuals that include only suggested ratings and a small amount of background information. The shorter type of manual is sometimes known as a **rating manual.** While the underwriting manual gives a thorough explanation of the nature and significance of each impairment considered, the rating manual provides basically the same information in a more concise form. Most companies have only one type of manual. Some companies, however, use their own rating manual as a guide to suggested underwriting action, but also have one or more comprehensive reinsurance manuals to use for background information on impairments. A prototype medical rating manual follows-

⮜⇔⮞

This Medical Underwriting Rating Manual contains representative health conditions and the anticipated underwriting actions that are used for these conditions. Conditions not covered by the Guide are reviewed by Underwriting to determine the appropriate underwriting action. This guide is not a complete underwriting manual.

XYZ Insurance offers two categories of anticipated health risk with appropriate premium rating assigned to each of these categories:

Preferred - Rates apply to applicants with medical conditions of minimal underwriting risk. There is a 25% rate variance from the preferred rates to the standard rates.

Standard - Rates apply to applicants with medical conditions of moderate risk or who fall within the Standard height/weight guideline. All tobacco users will be assigned standard rates.

Health Underwriting Guidelines

Height and Weight Table
Female

Height	Weight	
	Preferred	Standard
4'8"	76-128	129-157
4'9"	79-133	134-163
4'10"	81-137	138-169
4'11"	84-142	143-175
5'0"	87-147	148-181
5'1"	90-152	153-187
5'2"	93-157	158-193
5'3"	96-162	163-199
5'4"	99-167	168-206
5'5"	102-173	174-212
5'6"	105-178	179-219
5'7"	109-184	185-226
5'8"	112-189	190-232
5'9"	115-195	196-239
5'10"	118-200	201-246
5'11"	122-206	207-254
6'0"	125-212	213-261
6'1"	129-218	219-268
6'2"	132-224	225-275
6'3"	136-230	231-283
6'4"	104-236	237-291
6'5"	143-243	244-298
6'6"	147-249	250-306
6'7"	151-256	257-314
6'8"	155-262	263-322

Height and Weight Table
Male

Height	Weight	
	Preferred	Standard
4'8"	78-130	131-166
4'9"	80-135	136-172
4'10"	83-140	141-178
4'11"	86-145	146-184
5'0"	89-150	151-191
5'1"	92-155	156-197
5'2"	95-160	161-204
5'3"	98-165	166-210
5'4"	101-170	171-217
5'5"	105-176	177-224
5'6"	108-181	182-231
5'7"	111-187	188-238
5'8"	115-193	194-245
5'9"	118-198	199-252
5'10"	121-204	205-260
5'11"	125-210	211-267
6'0"	129-216	217-275
6'1"	132-222	223-283
6'2"	136-228	229-291
6'3"	140-235	236-299
6'4"	143-241	242-307
6'5"	147-247	248-315
6'6"	151-254	255-323
6'7"	155-260	261-331
6'8"	159-267	268-340

Riders/Waivers may be applied to either risk category. Some applicants may have conditions for which XYZ Insurance can apply waivers or riders to the contract rather than decline the applicant (not applicable for Life coverage). BCBSTX guidelines allow a maximum of three riders per applicant. Riders can be permanent or temporary and cannot be removed without Underwriting approval.

When coverage is approved with a rider, the applicant is notified in writing. Following this notification, a contract is issued with the rider(s) attached. If the applicant chooses not to accept the contract with the rider(s), the contract must be returned within ten days and any premium submitted will be refunded. Please remember that the application fee is non-refundable.

INELIGIBLE OCCUPATIONS	
Active Military Personnel	Offshore Drillers/Workers
Aviation & Air Transportation	Oil and Gas Exploration and Drilling (including offshore)
Crop Dusters	Professional Athletes
Instructors	Baseball
Stunt Pilots	Hockey
Test Pilots	Basketball
Other Pilots(Individually considered)	Soccer
Air Traffic Controllers	Football
Blasters or Explosive Handlers	Jockeys
Bodyguards	Wrestling
Firefighters/EMT's with Fire Dept.	Racers (all kinds) - Professional and Amateur
Hazardous Materials Transporters or Handlers*	Rodeo Performers - Professional and Amateur
Law Enforcement Officers/Private Detectives	Steel/Metal Workers
Loggers/Sawmill Operators	Steeplejacks
Meat Packers/Processors	Iron Workers
Mining (all kinds)	Security Guards (employed by Security Company)
Nuclear Industry Workers	Taxicab Drivers
	Window Washers (over 2 stories)

* Includes, but is not limited to oil, gas, petroleum products, bleach, fertilizer, nuclear waste, toxic/flammable chemicals, propane, paint, paint thinner, Asbestos.

UNACCEPTABLE MEDICAL CONDITIONS		
Addison's Disease	Colostomy/ileostomy (if present)	Myasthenia Gravis
Adrenal Insufficiency	Congestive Heart Failure	Narcolepsy
AIDS, ARC,HIV, or HTLV Positive	Coronary Artery Disease	Nephritis (chronic)
Alcoholism(within 5 years)	Crohn's Disease (Regional Ileitis)	Obesity Surgery
Alzheimer's Disease	Cushing's Disease	Paralysis
Amyotrophic Lateral Sclerosis	Diabetes	Paraplegia/Quadraplegia
Aneurism	Down's Syndrome	Parkinson's Disease
Angina Pectoris	Drug Abuse (within 5 years)	Peripheral-Vascular Disease
Anorexia Nervosa (within 10 years)	Emphysema	Polycystic Kidney Disease
Aortic (Regurgitation/ Insufficiency/ Coarctation)	Epilepsy (within 10 years)	Pregnancy
Atrial Fibrillation/ Flutter	Heart Disease/ Attack/ Bypass/ Angioplasty/ Pacemaker	Psychosis
Bright's Disease	Hemophilia	Raynaud's Disease
Buerger's Disease	Hepatitis (chronic)	Renal Failure
Bulimia (within 10 years)	Hodgkin's Disease (within 15 years)	Rheumatoid Arthritis
Cancer (within 10 years; certain Skin Cancers may	Hydrocephalus	Sarcoma
	Intestinal Bypass	Schizophrenia

be covered)	Kidney Dialysis/Transplant	Scleroderma
Cerebral Embolism or Thrombosis	Leukemia (within 15 years)	Serious Congenital Abnormalities
Cerebral Palsy	Lupus Erythematous	Sickle Cell Anemia
Chronic Obstructive Pulmonary Disease (COPD)	Lymphoma	Stroke
	Melanoma (within 7 years)	Transplants
Cirrhosis	Mitral Insufficiency/Stenosis/Regurgitation	Ulcerative Colitis
	Multiple Sclerosis	Wilson's Disease
	Muscular Atrophy/Dystrophy	

MEDICAL UNDERWRITING GUIDE Underwriting Guidelines are updated periodically to reflect changes in the health care industry. The Underwriting Actions given below are examples of usual Underwriting practices.

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

		Usual Underwriting Action			
Condition	**Underwriting Focus**	**Preferred**	**Standard**	**Decline**	**Rider**
Acne	Severity? Treatment? Recovered?	X			
Addison's Disease				X	
Adenocarcinoma	See 'Cancer other than skin'				
Adenoiditis	See 'Tonsillitis'				
Adhesions	Number of episodes? Operated? Recovered? When	X			X
Adrenal Insufficiency				X	
AIDS/HIV Positive				X	
Alcoholism (APS) Without Drug Abuse	Consider after 5 years	X		X	
Alcoholism (APS) With Drug Abuse	Consider after 10 years Treatment? Hospitalization? Relapse? Current Liver	X		X	

	Function test results					
Allergy	Frequency? Severity? Seasonal? Medications?	X				
Alzheimer's Disease					X	
Amputations	Individual Consideration: Cause? Symptoms? When? Which limb? Recovery?					
Anal Fissure	Cause? Operated? When?	X				X
Anal Fistula	Cause? Operated? When?	X				X
Anemia (APS)	Individual Consideration: Cause? Type? May require physician examination and lab results	X			X	
Aneurysm					X	
Angina Pectoris					X	
Angioplasty					X	
Anorexia Nervosa (APS)	Consider after 10 years			X	X	
Anxiety (APS)	Severity? When? Medications? Recurrence?					
Aortic Coarctation					X	
Aortic Insufficiency					X	
Aortic Regurgitation					X	
Appendicitis	Surgery? When? Complications?	X				
Arrhythmia (APS)	Individual Consideration: Type? Frequency? Severity? ECG required. Current physical exam	X			X	
Arteriosclerosis					X	

(APS)					
Arteriosclertoic Heart Disease				X	
Arthritis (may require APS)	Specific type? Severity? Exact location? Degree of limitation? Medication?	X		X	X
Asthma	Severity? Hospitalization? Frequency of attacks? Medications? Smoker?	X	X	X	X
Atrial Fibrillation				X	
Attention Deficit Hyperactivity Disorder (ADD or ADHD)	Age? Severity? Medications? Counseling?				

.....And so on, for many conditions, from A-Z.

Limitations of Underwriting Manuals

Although the underwriting manual has a significant place in the underwriting function, the manual should not be used as an absolute authority for several reasons. First, the information provided in many manuals is reliable only for frequently occurring, single impairments and frequently encountered combinations of a few impairments. Thus, many possible combinations of impairments are not listed. Further, the less common diseases included in the manuals are assigned ratings based on very sparse data.

Second, although the numerical rating method is a very precise mechanism for assessing anticipated extra mortality, it does have some limitations. Consequently, the suggested underwriting actions listed in the underwriting manual share the same limitations since they are based on the numerical rating method. For instance, the numerical method assumes a mortality rate that is higher than normal and that rises with age for the impairment in question, with the increase paralleling the normal increase in standard mortality at each age. This assumption may be true for overweight, diabetes, and some other impairments, but it is probably not true for many of the diseases shown in the underwriting manual. Even with its shortcomings, however, the numerical rating system is the most practical method yet devised for assessing anticipated extra mortality.

Third, because the task of keeping an underwriting manual up-to-date is formidable and time-consuming, especially in light of the rapid pace of medical advances, the information in such manuals is often dated and at best reflects experience from risks accepted at least five years earlier.

Finally, manuals generally reflect the anticipated extra mortality for prime ages only. Most manuals provide information for ages 25 or 30 through 55 or 60. Thus, to assess a risk on either side of these age limits requires some modification of the manual's suggested actions.

Deviation from Underwriting Guidelines

Insurers emphasize that the actions recommended in their underwriting manuals are suggested actions that may be modified according to the underwriter's own analysis of each case. Although an underwriter always strives for consistency in following the company's underwriting guidelines, special circumstances surrounding a case sometimes justify a change in the decision recommended in the underwriting manual based on the underwriter's interpretation of the facts or method of handling a particular situation. Such a change is sometimes justified for one of the following reasons:

1) a decision can be made without waiting to receive additional information that has been requested
2) a risk is accepted on an experimental basis
3) underwriting guidelines need to be modified to give an appropriate mortality appraisal
4) underwriters deviate from underwriting guidelines for business reasons unconnected with mortality appraisal.

Immediate Decision

In some cases, the proposed insured appears to be eligible for coverage, even though there may not be enough information in the application and supporting materials to present a perfectly clear picture of the risk. At this point, the cost of gathering more information should be considered as well as the likelihood that the underwriter can obtain the information within a reasonable amount of time. A decision is often made, especially with applications for small amounts, to approve a policy without requesting further information.

Experimental Underwriting

This is the practice of cautiously accepting specific types of risk at premium rates lower than those that would normally be charged according to the company's underwriting guidelines. Experimental underwriting is done by some reinsurers and large direct insurers in order to gain mortality experience for future statistical analysis. Direct insurers performing experimental underwriting frequently reinsure, either fully or partially, each unfamiliar risk assumed in experimental underwriting in order to protect themselves from the substantial extra risk involved in accepting such business. Experimental underwriting is practiced because life insurance companies want to grant insurance to as many people as possible while adhering to sound business judgment and company policy. However, companies refuse to accept some types of risk -such as an organ transplant or a very serious disease like cancer -not because past experience indicates that the case should be declined, but because the insurance company lacks experience insuring that particular type of risk. A certain amount of experience insuring a given risk is necessary in order to develop statistical mortality information and reliable underwriting guidelines. Usually, if a company lacks experience with a particular type of risk, the company will not issue coverage. However, if the company always declines

such risks, it will never get the needed experience. Under these circumstances, some companies choose to gain the needed experience by experimental underwriting.

Experimental underwriting should not be confused with what is sometimes called "speculative underwriting." **Speculative underwriting** occurs when an underwriter knowingly accepts a risk at an inadequate premium rate, attempting to obtain business by undercutting the market price for similar coverage. Speculative underwriting is dangerous since it disrupts the actuary's premium structure and can have an unfavorable effect on the company's mortality results. Unfortunately, the distinction between experimental and speculative underwriting has become blurred. The term, "experimental underwriting" is sometimes used to justify underwriting that is actually speculative.

Modification for Mortality Reasons

Sometimes, the unique circumstances of a particular case call for deviation from the company's established underwriting guidelines in order to make an appropriate mortality assessment. For example, suppose an applicant lists his or her occupation as "bartender:' Mortality studies clearly show that there is extra mortality risk associated with this occupation. Therefore, the question arises: Should insurers charge all bartenders more for their insurance than they charge other applicants? Based on available statistics and according to the numerical rating system, all bartenders are engaged in an occupation which calls for a higher premium in order to compensate for their increased mortality rate.

However, consider the cases of two different bartenders. Bartender A is a 45-year-old man, married, with three children, one of whom is in college. He has been employed in the same first-class hotel bar from noon to 8:00 p.m. for ten years, and information on the applicant indicates there is no drinking criticism -an underwriting term for evidence of alcohol abuse or alcoholism. Should this person be charged extra for insurance? Although mortality statistics and the numerical rating system say he should be charged a higher premium, underwriting judgment says probably not. As evidenced by the information presented in the case of this particular bartender, his work should not produce any appreciable extra mortality. Therefore, it would be unfair to charge him extra for life insurance solely because of his occupation. In contrast, Bartender B is a 27-year-old single man. He has been working 8:00 p.m. to 2:00 a.m. for two months in a small bar in New York. Prior to that, he worked comparable hours at a similar establishment in San Francisco for three months and before that at a pub in New Orleans for four months. Should he be charged the premium rate set by the actuaries? Again, underwriting judgment says *"no"* because the statistically determined extra premium probably would not be adequate to cover the extra mortality risk associated with this bartender's unstable work history. Consequently, this bartender should be charged an even higher premium for insurance coverage if insured. In each instance, therefore, the underwriter's own analysis can justify a deviation from the action recommended by the company's underwriting guidelines.

Decision-making Latitude

When developing its underwriting guidelines, management must decide how much latitude the company's underwriters should have in accepting or rejecting applications. For instance, in a given situation, will the underwriters be allowed to make exceptions to underwriting guidelines, or will the company require that its underwriters follow underwriting guidelines fairly rigidly? Although consistent underwriting is necessary in all companies, more experienced underwriters are often given more leeway to deviate from

the company's guidelines according to their own assessment of the situation. Large companies with sizable underwriting staffs may find it impractical to allow the majority of their underwriters much independence in this while a more flexible approach might be found in a small company staffed with only a few underwriters, all of whom are experienced. The more communication there is between the underwriter and agent, the more likely it is that a decision other than a strict classification will be made. This is the case, not because of agent pressure, but rather because the agent is in a better position to clarify or amplify the facts in the case
file.

Other Factors Taken into Account

A company's underwriting guidelines also take into account several other factors, including (1) the liberality of the company's insurability standards, (2) the degree of risk the company will accept, and (3) the extent to which reinsurance will be used. The liberality of a company's insurability standards is a question of the range of mortality risk that will be accepted in each of the company's risk classes. The higher the range of mortality a company accepts in a given risk class, the more liberal that company's insurability standards would be considered. For example, suppose three insurers each established a different range of mortality for their standard risk classes. Company A accepts 75 to 125 percent of standard mortality, Company B accepts 75 to 140 percent of standard mortality, and Company C accepts 75 to 160 percent of standard mortality. Because Company C accepts the highest range of mortality risk, this company would be said to have the most liberal insurability standards of the three companies, Company B's standards would be considered moderate, and Company A's standards would be considered conservative. A new, small company may adopt an aggressively liberal underwriting policy in order to compete in the marketplace with larger, well established companies. Once such a company has become established, however, it may move toward a more moderate, or conservative, underwriting policy.

Another question related to establishing a company's underwriting guidelines is the degree of risk the company will accept, that is, whether the company will work primarily within the standard risk area, specialize in substandard business, or steer a middle course between the two. An established company might not feel the need to be extremely competitive as far as special risks are concerned. A new company, however, might feel that aggressively pursuing substandard business is a necessary step in getting started and also in attracting brokers who could eventually become fulltime producers for the company.

Another important question is to what extent reinsurance will be utilized and what the company's retention limit will be. (Reinsurance is discussed in Chapter 1) The term *retention limit* refers to the maximum amount of insurance a company will carry at its own risk. To protect themselves from excessive losses due to unusually large claims or due to unusual fluctuations in the total number of claims, insurance companies generally reinsure risks for amounts higher than their retention limits. By using reinsurance, companies can safely accept applications for very large amounts of coverage or for highly substandard risks which would otherwise have been rejected or insured only for an amount equal to the company's retention limit. A company can purchase reinsurance for the entire amount of insurance an individual applies for or can purchase reinsurance for only that portion of the risk that exceeds the company's retention limits.

Chapter 4 UNDERWRITING STEPS

For each application submitted to an insurer, a case file is established that includes information needed by the underwriter in order to evaluate and classify the risk. Case files are systematically distributed to underwriters, who sometimes request additional information to facilitate their decision making. Applications are generally underwritten by one underwriter, whose decision may be subject to approval by a more experienced underwriter. In some cases, however, alternative underwriting approaches may be used.

Preliminary Processing

An application that is received at the home office underwriting department normally goes through several stages of preliminary processing before it is reviewed by an underwriter-
1) some form of preliminary review before files are sent to underwriters
2) verification of the status of the submitting agent
3) a search of existing records for any information about the proposed insured, and
4) a request for information from the Medical Information Bureau (MIB).

The steps included in this processing vary from company to company, but the following procedures are representative of the activities performed in many companies at this stage in the underwriting process. Generally, the application is assigned an identification number to be used first for control purposes and later as the policy number if a policy is issued. Various forms are prepared to control the file's progress through the underwriting process. In many companies, some type of preliminary review process is performed before case files are sent to underwriters to assure that the application and supporting materials are complete and in order. The process typically addresses the following types of questions-

- Does the applicant's age meet the criteria for the type of plan requested?
- Do the company's underwriting guidelines ask for any additional information requirements that have not yet been ordered?
- Does the file show that proper Fair Credit Reporting Act (FCRA) pre-notification has been given?

If any information is missing or if any aspect of the application process has not been carried out properly, the underwriting department clerical staff will notify either the underwriter or the submitting agency, depending on the nature of the missing information. In addition, the status of the submitting agent must be verified. In verifying the agent's status, either the clerical staff or a computer program will answer the following types of questions-

- Is the agent licensed to sell the type of policy for which application was made?
- What type of license does the agent hold?
- Is he or she a full-time company agent or a broker?

Identification of the soliciting agent is important to the underwriter, because it tells whether the agent is qualified to write the type of application submitted. For example, if the agent is not licensed to sell variable life insurance, an application for such a policy will be declined or approval and issue will be withheld until the agent's licensing

requirements are met. If necessary, further information regarding an agent is requested from the agency department, and the case is flagged to alert the underwriter that such information is yet to come.

Information for Current Files

Generally, company records are searched for information regarding the proposed insured. Depending on company procedures, some or all existing information may be attached to the current application file. Some company procedures require that only previous insurability information be included in current files. Other companies' procedures call for previous application files to be made available so that the underwriter can compare older insurability information on the proposed insured against current information. All previous applications may be attached to the current application, although some companies require only those applications submitted within a certain period -such as three years before the current application -plus any prior declined applications or substandard issues. Information may also be requested concerning the status of any policies previously issued to the applicant. Such information tells the underwriter the total amount of coverage the applicant already has through the company, so that the underwriter can determine whether additional evidence of insurability is necessary. If the applicant is covered by one of the company's health insurance policies, the processing clerk may request from the company's claims department any existing record of the applicant's claims experience as well. Information from even the oldest files has been digitized these days and relevant information from old files can be summarized in a computer generated report.

Depending on departmental procedures, a report from the Medical Information Bureau (MIB) may be requested during this preliminary stage if the insurance company is an MIB member. The MIB, a United States and Canadian non-profit organization, receives and stores in coded form certain specified impairment information from applications for insurance received by member companies. When a properly authorized member company requests an MIB report on an applicant, the MIB transmits to the company any information it has in its database. The information is sent in the form of numerical codes. Although the MIB codes themselves may not be used as the basis for any unfavorable underwriting action, except under clearly defined and limited conditions, these MIB codes can alert the underwriter to investigate certain unrevealed insurability problems. All of this information, plus the application and a worksheet -sometimes referred to as a data sheet -make up the application case file. The worksheet contains basic information concerning the proposed insured and identifies the branch office and agent who submitted the application. The underwriter uses the worksheet to document every step of that file's evaluation.

Case Assignment Systems

When a completed case file is ready to be underwritten, it will be assigned to a particular underwriter according to an established case assignment system. The method used to assign case files to underwriters varies depending upon the size of the company and the number of applications usually received. Within any underwriting department, however, there must be a system that ensures a fair distribution of files among underwriters. The four most common case assignment systems call for distribution of case files using one of these criteria-

1) the face amount requested
2) the type of application
3) the geographic origin of the application
4) the last name of the applicant.

Some companies assign cases to underwriters based on the face amount of the coverage requested. In this type of case assignment system, underwriters generally will be assigned only cases for amounts that the underwriter is authorized to approve. If cases are assigned based on the type of application, certain underwriters may be assigned only applications requiring a medical examination report, only nonmedical applications, or only combination business -that is, concurrent applications for life and health coverage on the same person. Other underwriters may handle only policy changes and reinstatements. If the geographic origin of the application is the basis of a company's case assignment system, then the underwriting department is divided into regional underwriting sections, with each section handling all the business from agencies within a specific geographic area. Alternatively, some companies prefer to assign specific agencies to specific underwriters, regardless of the geographic location of each agency. A geographic distribution gives the underwriter a better opportunity to become familiar with the quality of agents' business and to develop a good working relationship with the agents, two important considerations in underwriting. This approach also allows underwriters to become more knowledgeable about problems peculiar to an assigned area which might be related to environment or occupation and about legislative and regulatory differences among various jurisdictions. One disadvantage to the geographic approach is that vacations and absences may result in a different underwriter's having to work temporarily in "unfamiliar" territory. This problem can be solved, however, by periodic rotation of assignments and by the keeping of notes or manuals regarding the differences among various areas.

Underwriting the Case

After preliminary processing, the application for insurance coverage goes to the underwriting staff. The underwriting staff usually consists of one or more underwriters who have the following responsibilities:

- Evaluating and taking action to approve as written, rate, or decline applications for insurance
- Evaluating policy reinstatements and policy changes that involve an increase in risk
- Maintaining close communication with agents, making periodic visits to agency offices, and conducting underwriting seminars for agents
- Keeping abreast of medical, regulatory, and industry developments (a) by maintaining comprehensive files on assigned underwriting topics -for use both in research and in revisions of underwriting manuals and underwriting standards- and (b) by attending local, regional, and national underwriting professional meetings

Information Sources

The case file given to an underwriter for evaluation contains information from various sources. Some of the information sources found in any given case file are included or ordered by the field agent based on the company's underwriting requirements and vary

depending on the age of the proposed insured and the face amount of the policy. Information sources include the following:
1. Part I of the application for insurance, which identifies the proposed insured, specifies the coverage requested, and gives basic insurability information
2. Part II of the application, which consists of medical information regarding the proposed insured-this information may be either (a) the report of a physical examination conducted by a physician or paramedical technician, or (b) the answers to medical questions that either the field agent or the examiner has asked the proposed insured
3. The agent's statement, in which the submitting agent reports any knowledge he or she may have regarding the proposed insured that was not included in the application
4. A report from the Medical Information Bureau (MIB) regarding underwriting information reported to the MIB by other insurance companIes
5. An Attending Physician's Statement (APS), which is a statement from one or more of the proposed insured's personal physicians regarding his or her treatment of that individual
6. A report concerning the proposed insured's background, business activities, financial standing, mode of living, and other information- this information may be gathered from many sources, including public records, interviews with people who know the proposed insured, and an interview with the proposed insured

Property Casualty Underwriting Development

The underwriter compiles information from a number of sources to develop a profile of loss exposures including the applicant's business operations, financial condition, and other characteristics. The underwriter pays close attention to information about hazards, which are conditions that increase the frequency or severity of a loss. Underwriters identify four hazard categories, as follows:
Physical hazards
Moral hazards
Morale hazards
Legal hazards

A **physical hazard** is a tangible condition of property, persons, or operations to be insured that increases the frequency or severity of loss. An untrained driver, damageability of cargo being shipped, and the quality of public fire protection are all examples of physical hazards.

A **moral hazard** is a condition that increases the likelihood that a person will of intentionally cause or exaggerate a loss. Underwriters try to recognize symptoms of moral hazard, such as property that is grossly overinsured. An insured facing serious financial difficulty might present a moral hazard because such difficulty might present an incentive to commit insurance fraud.

An **attitudinal hazard**, traditionally called morale hazard, is a condition of carelessness or indifference that increases the frequency or severity of loss. Careless driving, failure to lock an unattended building, or failing to clear an icy sidewalk to protect pedestrians are examples of attitudinal hazards.

A **legal hazard** is a condition of the legal environment that increases loss frequency or severity. For example, people in some geographic areas are much more litigious-likely

to initiate a lawsuit-than those elsewhere.

The principal sources of underwriting information are the producer, the application, loss control or independent inspection reports, government records, financial rating services, loss data, field marketing personnel, premium auditors, claim files, and production records.

Producers

The producer can be an excellent source of underwriting information about the loss exposures of an insurance applicant. Typically, the producer has personal contact with the applicant, has firsthand knowledge of the applicant's business operations, and knows the applicant's reputation in the community. The producer usually determines the applicant's coverage needs and "pre-qualifies" or field underwrites applicants.

The degree to which an insurer depends on the producer to evaluate the applicant varies by producer and type of business and might differ based on the insurer's marketing system. Direct writing and exclusive agency insurers are explicit about the characteristics of the ideal applicant. Producers for these insurers screen applicants knowing the criteria that their insurers' underwriters use.

Producers for independent agency insurers face a more complex task, because they must understand the marketing goals and underwriting guidelines of the various insurers they represent. Independent agents must also try to balance the placement of their business among their insurers to maintain good relations and to meet the obligations of their various agency contracts. The ability to match each applicant with an appropriate insurer is an essential skill for independent producers.

Applications

Insurance applications provide general information required to process, rate, and underwrite loss exposures of the applicant. Usually, a different application form exists for each type of insurance. The application requires specific information necessary to evaluate the acceptability of an applicant's loss exposures for that type of insurance. Each insurer develops its own application or uses standard ACORD applications. Industry committees developed ACORD applications to reduce the amount of paperwork producers must handle when working with several insurers.

Even when an application is completed properly, the underwriter usually finds it necessary to obtain additional information about the applicant's loss exposures. This information can be categorized as internal or external and objective or subjective. Internal information, which comes from the insurer's in-house sources, can usually be accessed quickly and economically. External information, which comes from outside sources, might be expensive to obtain and might delay the processing of the application.

Objective information consists of recorded facts that can be verified. Subjective information consists of opinions or personal impressions. The underwriter must identify subjective information that could influence objective information. For example, a published article about a business applying for insurance might reflect the author's bias.

The applicant's product brochure probably emphasizes the product's positive features and minimizes any shortcomings.

Inspection Reports

Independent inspection or loss control reports provide underwriting information about the property's physical condition, the business operations' safety record, and the insured's management.

Most inspection reports in commercial insurance contain mandatory and suggested recommendations. The underwriter could follow up to determine the degree of compliance, which provides insight into management's attitude toward safety.

Government Records

Government records that provide underwriting information include motor vehicle reports; criminal court records; and civil court records, including records of suits filed, mortgages and liens, business licenses, property tax records, and bankruptcy filings.

Motor vehicle records (MVRs) are a fundamental information source for auto underwriting. Some states require insurers to obtain MVRs each year so that drivers' convictions for traffic violations and/or accidents can be incorporated into each policy's rating scheme. Most underwriters use independent services to obtain civil and criminal information even though they can obtain that information directly from court records. Civil and criminal reports show any previous bankruptcies or judgments that are on record.

Financial Rating Services

An applicant's financial status provides important underwriting information. Dun & Bradstreet (D&B), Standard & Poor's, and TRW are some of the major financial rating services that underwriters use. These services provide data on the credit ratings of individual businesses, together with industry averages for comparison. Using a financial rating service is almost universal in surety bond underwriting, and the services are also used with many other types of commercial insurance. Services can verify an applicant's financial statements and can provide an overall picture of the applicant's financial status. A financially weak business might present an unacceptable hazard. To understand financial rating service data, the underwriter should be familiar with financial ratios used to evaluate a firm's liquidity, profitability, and debt structure. In addition, the 10K form filed with the Securities and Exchange Commission (SEC) contains a wealth of information on public companies.

Loss Data

Underwriters usually have access to aggregate loss experience by class, type of insurance, and territory, both for the insurer and the industry, as well as loss experience on individual policyholders and producers. Aggregate data might indicate insurance rate inadequacy, causing a modification of underwriting policy pending approval of higher rate levels. The loss experience of a commercial policyholder might be extensive enough to be statistically significant on its own, while the loss experience for the class

or territory has more significance in personal insurance.

Loss frequency, loss severity, and the type of loss are all important when analyzing loss data and evaluating loss exposures. Hazards might be reduced through loss control measures, or insured losses might be reduced by adding or increasing a deductible. The cause and date of loss provide further insights into loss exposures. For example, the date of loss provides information on possible seasonality or trends in loss experience.

Field Marketing Personnel
In most insurers, field marketing personnel (such as marketing representatives or special agents) can provide both specific and general underwriting information. Field marketing personnel often obtain information that a producer omitted from an application. In sparsely populated areas or other situations in which qualified loss control personnel are not available, many insurers use field marketing personnel to make simplified inspection reports. The field marketing person can also provide detailed background information on the producer and sometimes on the applicant. Sales managers, MGAs, or the producer might also provide this type of information.

Premium Auditors
The premium auditor can gather information about the policyholders' operations that might have underwriting implications, including moral and morale hazards. The premium auditor examines the policyholders' operations, records, and books of account to determine the actual loss exposure for the coverage already provided.

Claim Files
When renewing existing policies, an underwriter can obtain insights into the policyholder's character by reviewing the policyholder's claim files. Claim adjusters typically accumulate a significant amount of underwriting information during their investigations. For example, an adjuster investigating a small fire loss at a machine shop might uncover evidence of poor housekeeping and the policyholder's disregard for loss control. Some insurers have a formal system for claim adjusters to notify underwriters about pertinent information on hazards.

For personal insurance policies, a claim file review can identify insureds who are making many small claims that most people attribute to normal wear and tear. For a workers compensation policy, a claim file review might help the underwriter identify dangerous conditions requiring loss control attention. The claim adjuster is one of the few insurer employees who get a firsthand view of the insured locations. The adjuster's observations are valuable, and every effort should be made to gain them.

Production Records
Records on individual producers, indicating loss ratio, premium volume, mix of business, amount of supporting business, length of service, and industry experience, help underwriters make decisions about the quality of the applicants that the producer is submitting. In personal auto underwriting, for example, the mix of business indicates whether a particular producer is submitting an inordinately large percentage of young drivers or drivers with poor driving records. In commercial insurance, production records indicate the producer's familiarity with complex or unusual classes of business. For example, the producer's background and experience might be a concern to the

underwriter evaluating a complex manufacturing submission. If the producer's business involves mostly personal insurance, the underwriter might question the producer's familiarity with commercial coverages and his or her ability to service those accounts properly. With an independent agent, the number and identity of other insurers represented by the agency are also relevant. In all marketing systems, producer results over time (usually three to five years) are a good measure of the producer's capability as a field underwriter.

Underwriting, Pricing and the Actuary

Somebody gave the life underwriter the idea that, if the company insured a large enough number of healthy 35-year-old males, the death rate would be 2.51 per 1,000. Somebody gave the property underwriter the idea that, if the company insured enough brick buildings located no more than 5 miles from a fire station, the loss rate would be 1 percent of the value of the insured property. That "somebody" is called an actuary[1]. All insurance companies rely on actuarial mathematicians to compile statistics of losses, to develop insurance rates, to calculate dividends, and to evaluate the financial standing of the insurance company. Actuaries review past statistics and project future results to develop rates. In insurance, the price of the policy must be determined before the costs are known, and it is the challenge of actuarial science to predict these costs before the losses occur.

Part of the difficulty of the actuary's job is to develop rates that are fair to all insureds. Wooden houses are more loss prone than are brick houses, so the two must be charged different rates. Females aged 21 have lower mortality rates than do females aged 65, so they are charged different life insurance rates. But as the actuary tries to draw finer and finer distinctions, say, between houses 10 miles from a fire station and houses 13 miles away, or between a person 25 pounds overweight and one 35 pounds overweight, the challenge becomes much greater. It should be remembered that the law of large numbers operates when the number is "large," and if the actuary and his or her partner, the underwriter, try to draw distinctions that are too fine, they will lose the predictability provided by the law of large numbers. Thus, the actuary's task is to develop distinctions that treat all members of the insurance pool fairly, yet at the same time preserve the predictability provided by the law of large numbers.

In addition to developing rates, insurance companies need actuaries to calculate and analyze operating results or profits, to calculate dividends, and to develop scientific loss reserves, all calculations involving estimates of unknown factors. The actuary is a skilled mathematician who applies his or her knowledge to solving insurance problems. Actuaries have professional societies that award designations to members that pass a rigorous series of examinations. The F.S.A. (Fellow of the Society of Actuaries) designation is earned by those working primarily in the life insurance area; those actuaries working primarily in the nonlife insurance area pass the examinations leading to the F.C.A.S. (Fellow of the Casualty Actuary Society) designation. These designations can be earned only after attaining a college degree, several years of practical experience, and many hours of study in areas such as mathematics and accounting.

[1] An actuary is a person trained in applying mathematical techniques to insurer operations.

The demand for the services of actuaries is strong. Not only do insurance companies need actuaries, but consulting companies working in the area of pension plans and other employee benefits, and regulatory agencies require actuarial services.

Actuary and Reserving

The actuary estimates the current financial impact of future contingent events and uses mathematical and statistical techniques to solve business related problems.
The life actuary specializes in the statistical nature of life products such as term and whole life policies and pensions. A casualty actuary specializes in property and liability lines of insurance, such as automobile insurance. Basic tasks of an actuary include-
Ratemaking- Establishing the correct rate to charge for an insurance product
Reserving- Determining the value of a company's loss and expense liability

The Field of Insurance Is Different From Other Businesses

	Cost of Production	**Valuation of Assets**	**Valuation of Liabilities**
Insurance	Even though customers pay for insurance today, the final cost of the product may not be known for many years.	Regulation of investments makes it easier to value an insurer's assets.	Liabilities such as unpaid losses and expenses are more difficult to value.
Other Businesses	Known at time of production	Assets are more difficult to value (e.g. value of bonds).	Amounts are more explicit and more easily quantifiable

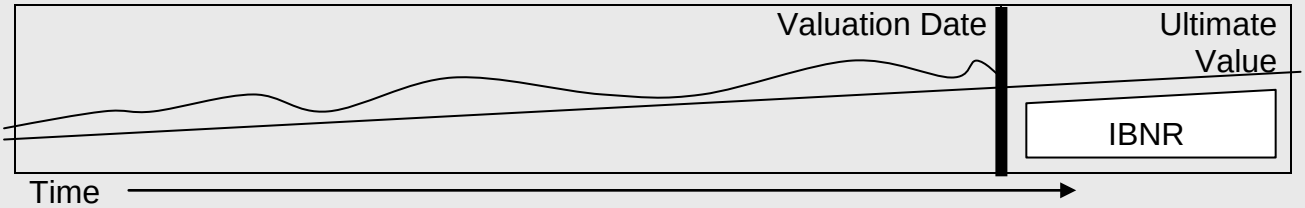
It is the actuary's job to determine the value of the unpaid losses and loss expenses for which a company is liable at any point in time. This is done in bulk to reflect payments on cases not yet reported IBNR (Incurred But Not Reported) and adjustments to case reserves established by the claims examiners IBNE (Incurred But Not Enough). A value can a value can be placed on accidents which have happened but have not yet been reported to the claims department.

Required Steps on the Way to Establishing the Value of Reserves
To conduct a study of an insurer's claim information, the actuary first needs to analyze and evaluate the following within the company's various departments.

- Claims Department
- Payment records
- Case reserves
- Reserving practices
- Data Processing
- Claims data
- The quantity and nature of any data backlog
- The impact of changes in data processing operations
- Accounting and Underwriting
- The company's draft financial statement and underwriting guidelines

Having collected and studied insurance company data, the actuary can estimate the value of reserves required to pay all claims for the period under study with the following process.

Process for Establishing the Value of Reserves
First the underwriter compiles information recorded in the claim system through the valuation date. Then the data view is adjusted to correct for historical inconsistencies by studying settlement and reporting patterns and company reserving practices. Using a number of reserving methods, a determination is made as to the method to employ to correct total reserves required to pay unsettled reported claims (IBNE) and unreported claims which have already occurred (IBNR).



In order to make this process run smoothly from an actuarial standpoint, it is important that claims examiners consistently establish case reserves in accordance with company policy. This includes adjusting the case reserve on a claim to reflect payments as they are made and make sure the reserve is "0" when the final payment is made. The claims examiners contribution to the actuary's efforts is important because ultimately reserve estimates that are established reflect on the company's surplus (net worth).

Methods of Determination
These are a few of the methods that the actuary uses to determine the value of reserves. A variety of methods are used because certain methods perform better than others under different statistical circumstances.

Incurred Loss Development Method: Step 1
Establish aging ratios based on known incurred losses for each year of coverage. Bold type ratios with subscript in the second table are created from the known losses in the first table which are bolded with corresponding subscript. This process is continued to create the whole table of Time to Time ratios.

Average Ratio- Use average ratio to project ultimate incurred loss on all written insurance.

	Months of Development						
Accident Year	12	24	36	48	60	72	84
20x0	**58,641$_a$**	**74,804$_a$**	77,323	77,890	80,728	82,280	82,372
20x1	**63,732$_b$**	**79,512$_b$**	83,680	85,366	88,152	87,413	
20x2	51,799	**68,175$_c$**	**69,802$_c$**	69,694	70,041		
20x3	40,143	67,978	75,144	77,947			
20x4	55,665	80,296	87,961				
20x5	43,401	57,547					
20x6	28,800						

Time To Time Ratios

Accident Year	**1-2**	**2-3**	**3-4**	**4-5**	**5-6**	**6-7**
20x0	**1.276$_a$**	1.034	1.007	1.036	1.019	1.001
20x1	**1.248$_b$**	1.052	1.020	1.033	0.992	
20x2	1.317	**1.024$_c$**	0.998	1.005		
20x3	1.693	1.105	1.037			
20x4	1.443	1.095				
20x5	1.326					
20x6						

Incurred Loss Development Method: Step 2

Establish aging ratios based on known incurred losses for each year of coverage.
Calculate the average ratio for each period
Use average ratio to project ultimate incurred loss on all written insurance.

Months of Development

Accident Year	12	24	36	48	60	72	84
20x0	58,641	74,804	77,323	77,890	80,728	82,280	82,372
20x1	63,732	79,512	83,680	85,366	88,152	87,413	
20x2	51,799	68,175	69,802	69,694	70,041		
20x3	40,143	67,978	75,144	77,947			
20x4	55,665	80,296	87,961				
20x5	43,401	57,547					
20x6	28,800						

Time To Time Ratios

Accident Year	**12:24**	**24:36**	**36:48**	**48:60**	**60:72**	**72:84**	**84:Ultimate**
20x0	1.276	1.034	1.007	1.036	1.019	1.001	
20x1	1.248	1.052	1.020	1.033	0.992		
20x2	1.317	1.024	0.998	1.005			
20x3	1.693	1.105	1.037				
20x4	1.443	1.095					
20x5	1.326						
20x6							
Average	**1.384**	**1.062**	1.016	1.025	1.006	1.001	1.000

Incurred Loss Development Method: Step 3

Establish aging ratios based on known incurred losses for each year of coverage.
Calculate the average ratio for each period
Use average ratio to project ultimate incurred loss on all written insurance. Remaining unknown losses (bold type) in first table are determined using the known losses and the average ratios. Subscripts correspond to show how known losses multiplied by the

average ratio determines unknown losses (bold). Remaining unknown losses (black bold type) are determined in the same way.

	Months of Development						
Accident Year	12	24	36	48	60	72	84
20x0	58,641	74,804	77,323	77,890	80,728	82,280	82,372
20x1	63,732	79,512	83,680	85,366	88,152	$87,413_{f}$	**$87,500_{f}$**
20x2	51,799	68,175	69,802	69,694	$70,041_{e}$	**$70,461_{e}$**	**70,531**
20x3	40,143	67,978	75,144	$77,947_{d}$	**$79,896_{d}$**	**80,375**	**80,857**
20x4	55,665	80,296	$87,961_{c}$	**$89,368_{c}$**	**91,602**	**92,152**	**92,224**
20x5	43,401	$57,547_{b}$	**$61,115_{b}$**	**62,093**	**63,645**	**64,027**	**64,091**
20x6	$28,800_{a}$	**$39,859_{a}$**	**42,330**	**43,007**	**44,082**	**44,346**	**44,390**

	Time To Time Ratios						
Accident Year	12:24	24:36	36:48	48:60	60:72	72:84	84:Ultimate
20x0	1.276	1.034	1.007	1.036	1.019	1.001	
20x1	1.248	1.052	1.020	1.033	0.992		
20x2	1.317	1.024	0.998	1.005			
20x3	1.693	1.105	1.037				
20x4	1.443	1.095					
20x5	1.326						
20x6							
Average	**1.384_{a}**	**1.062_{b}**	**1.016_{c}**	**1.025_{d}**	**1.006_{e}**	**1.001_{f}**	**1.000**

Paid Loss Development Method

With this method, the actuary uses the record of actual loss payments and disregards the case reserves on a group of claims in order to project the ultimate cost of those claims.

Expected Loss Ratio Method

EXPECTED LOSS RATIO METHOD

Policy Year	Earned Premium	Expected Loss Ratio	Ultimate Incurred Losses
20x0	117,647	70%	82,372
20x1	125,000	70%	87,500
20x2	100,759	70%	70,531
20x3	115,510	70%	80,857
20x4	131,749	70%	92,224
20x5	91,559	70%	64,091
20x6	63,414	70%	44,390

Borheutter Method

This technique can be used to project ultimate losses with pure premiums, average claim size, or expected loss ratio. One of these values is selected for each year by reviewing the results from other methods, and analyzing company and industry trends. To use the method with pure premium, expected losses are derived as the product of the exposures, the selected pure premium, and the loss emergence factor. The loss emergence factor is the complement of the reciprocal of the cumulative development factor selected in the paid loss development method. The resulting expected losses are added to losses paid to date to calculate ultimate incurred losses. This method may be appropriate in situations where-

- The application of a multiplicative development factor can have a distorting effect on ultimate incurred loss projections.
- Data is too inconsistent to build a pure premium. In these cases, the results from the incurred loss and paid loss development methods are used to select an expected pure premium in each year and then a traditional application of the Bornhuetter Ferguson technique is used.
- An adjustment is required when the development methods produce distorted results.

Incurred losses and paid losses use a traditional Bornhuetter/Ferguson approach. The expected loss ratios used in this projection are developed from a review of the results of other methods of estimating losses and cost.. This method combines expected losses with losses reported to date. Only the method using incurred losses is used in the final projection of ultimate loss. The paid projection is only used in selecting the average claim size. This method assumes that the emergence of reported losses (or paid losses) after any evaluation date is not a function of losses reported as of that date, but depends on an independent measure of expected losses. Thus this method works well for immature policy years.

Loss Reserving Standards

A set of standards must be observed by C.A.S. licensed actuaries when conducting actuarial studies. These standards are from the Casualty Actuarial Society.

Data Organization- *Accident Date*: Date that a loss occurred or is deemed by claims personnel to have occurred; *Report Date*: Date that a claim is first reported to the insurer; or *Valuation Date*: Date through which transactions may be included in the evaluation of the liability.

Data Availability- Enough data must be made available in a enough detail so that the actuary can properly assess reserves.

Emergence Patterns- The delay between the occurrence and recording of the claim

Settlement Patterns- The length of time that it takes for reported claims to settle

Development Patterns- It is important for there to be consistency in the settlement and reserving of claims.

Frequency and Severity- A high frequency of claim occurrences along with a low average claim size make reserve estimates more reliable.

Reopened Claims Potential- The inclination of closed claims to reopen varies significantly from one line of business to the next and is effected substantially by claims department practices.

Operational Changes- Changes in computer systems or accounting, claims handling, or underwriting procedures can have an impact on loss experience.

Reasonableness- The actuary should consider the relationship (ratio) between the loss estimate and some other loss independent measure such as premiums, exposures, or claims counts.

Loss Reserving Methods- An actuary will usually look at the results of more than one

loss reserving method when estimating the loss and loss adjustment expense liability for a specific group of claims. Though they may not be exact, case reserves must be established through the consistent application of claims department policy. Case reserves must be kept current so that the actuary is working with as much "real" information as possible.

Summary of Actuarial Principles

A succinct statement on the subject of underwriting and risk classification for insurance is set forth in ASOP 12 (Actuarial Standards of Practice Statement 12, “Concerning Risk Classification”), first issued by the Actuarial Standards Board (ASB) in 1989 with a revision in 2004. ASOP 12 is a highly condensed summary of actuarial principles and practice guidance bearing on the subjects of risk classification and underwriting.
In relevant part, ASOP 12 provides actuarial guidance on:
Selection of risk characteristics to be used in classifications:
(1) risk characteristics should be objective and related to expected outcomes (e.g. differences in cost)
(2) the relationship may be established by a correlation between risk characteristics and outcomes
(3) a causal relationship need not be demonstrated, and
(4) state law may constrain the selection of risk characteristics.
Sources of information and acceptable methods of demonstrating a relationship between risk characteristics and outcomes include:
(1) relevant information from any reliable source including analysis of any available data; the reliability of externally-supplied data falls upon the supplier
(2) expert opinion and clinical experience
(3) inferences without specific empirical demonstration
(4) statistical methods subject to the individual judgment of the actuary.
Constraints and limitations: the level of analytic detail provided should be weighed against practical considerations of time, cost and effort. The analysis should be consistent with industry and business practices.
In terms of supporting empirical evidence, industry practice varies. Some insurers study their own databases for information about risk characteristics and claim costs. Depending on their size and sophistication, these insurers may be able to capture relationships between risk and cost which are most relevant to the population(s) subject to classification. Other insurers probably rely more extensively on proprietary underwriting guidelines generated by actuarial consulting firms. Actuaries and other policy makers in the insurance industry consider the following questions when applying ASOP 12 as a part of an insurer’s underwriting and risk classification guidelines-
1.) Are the elements of the classification (e.g. medical condition, current treatments, history of prior treatment) sufficiently correlated with the relevant outcome measure (e.g. an elevated level of cost) for all members of the defined policyholder class? And, to what should costs be compared? What is the appropriate benchmark comparison group or class?
2.) Is any element of the classification superfluous? Does each element make a statistically significant contribution to the outcome?
3.) Is the correlation between classification and the outcome (cost) bona fide? Is it clear that the correlation is not an artifact of one or more unmeasured variables (i.e. statistically spurious)?
4.) Is it clear that an otherwise lawful classification is not operating as a surrogate for one which is impermissible, e.g. medical condition as a surrogate for race?

5.) Are the data used to establish the correlation between classification and outcome drawn from actuarial cost experience of people who are substantially similar to those subject to the classification?
6.) Are the data sufficient to ensure a high degree of accuracy (actuarial credibility)?
7.) Are members of the class similar and consistent with one another in terms of risk profiles ("homogeneity")?. Do members of one class have risk/cost profiles which are distinct from members of other classes ("separation")?
8.) Where the insurer's underwriting action is to decline a category of risks outright, can the insurer demonstrate that excess costs are not transitory and cannot be mitigated with less severe underwriting actions, e.g. a time-limited exclusionary rider?

Must Know Whereof They Speak

The final evaluative question falls into a zone which actuaries might view as being discretionary. In effect, it recognizes that target insurance sets (and subsets) often incur initial costs in excess of "standard" populations but that this cost differential narrows over time. The term of art for this phenomenon is "underwriting wear-off". In lieu of classifying a risk as uninsurable and denying coverage outright, an insurer has the option of offering coverages having time-limited restrictions. These could be in the nature of waiting periods or exclusionary riders which would allow the policyholder to attain standard coverage at the conclusion of the "wear-off" period. This raises a possible question whether the classification and underwriting plan fairly recognizes the actuarial probability that individuals with elevated costs in some initial time period will subsequently have costs which fall into the standard cost level.

Chapter 5 PRICING INSURANCE PRODUCTS

As stated at the beginning of the text, part of the underwriting process is assessing risk. Another part is pricing product based on that risk assessment. This chapter begins by describing ratemaking goals from the perspective of both insurers and regulators. Next, it briefly describes the persons or organizations that are responsible for ratemaking. The ratemaking process and terms are introduced using an auto insurance example, and factors that affect ratemaking are examined. Next three different ratemaking methods are examined: the pure premium method, the loss ratio method, and the judgment method.

Ratemaking involves how past loss statistics are used to develop future rates. No matter how complete and accurate these statistics might be, they can only tell what has happened in the past. Insurance pricing promulgators cannot foretell the future, and they cannot guarantee that the future will resemble the past. They can only use their best judgment in interpreting developments and trends in order to anticipate what is most likely to occur in the future.

Pricing Objectives

Insurance ratemaking is challenging, because future losses and expenses are unknown when rates are developed. In light of this uncertainty, insurers try to develop rates that meet their goals as well as regulatory goals.
The primary goal of ratemaking is to develop a rate structure that enables the insurer to

compete effectively while earning a reasonable profit on its operations. To accomplish this, the insurer must develop rates that adequately cover all losses and expenses and leave a reasonable amount for profits and contingencies.
This ratemaking goal complements the underwriting goal, which is to develop and maintain a profitable book of business. To maintain its book of business, the insurer must have competitive rates.

Adequate Rates

To be profitable, the insurer must have adequate rates. To enable an insurer to be competitive and profitable, rates should ideally have five characteristics. Rates should:
1. Be stable.
2. Be responsive.
3. Provide for contingencies
4. Promote loss control
5. Be simple.

Rates do not always have all of these characteristics. Also, some characteristics conflict with others, and compromises are often necessary. Stable rates are highly desirable because changing rates is expensive. Additionally, sudden, large rate changes cause dissatisfaction among customers and sometimes lead to regulatory or legislative actions. However, rate stability could conflict with the responsiveness characteristic, which suggests that rates should change promptly in response to external factors that affect losses. Rate stability might :also conflict with the characteristic that rates should provide for contingencies, such as unexpected variations in losses and expenses. Ratemaking systems should address the fourth characteristic, promote loss control, by providing lower rates for policyholders who exercise sound loss control. For example, policyholders who install burglar alarm systems receive a reduction in their crime insurance rates. Lower fire insurance rates are charged to policyholders who install automatic sprinkler systems at their premises. On the other hand, policyholders who engage in activities that tend to result in more losses, such as persons who use their cars for business, generally pay higher rates.

Ratemaking systems should also be simple enough for producers, underwriters, and even policyholders to understand. Policyholders range from naive personal insurance customers to sophisticated corporate risk managers with advanced designations and degrees. The level of insurance expertise is generally much lower for personal insurance customers than for commercial insurance customers. Insurance rates must also meet regulatory requirements, including goals that rates be adequate, not be excessive, and not be unfairly discriminatory.

Ratemaking Responsibility

Actuaries usually supervise ratemaking activities. An actuary is a person trained in applying mathematical techniques to insurer operations. Many large insurers employ one or more staff actuaries, whereas small insurers tend to rely on actuarial consultants. Insurers with staff actuaries might also retain actuarial consultants, either because their staff actuaries lack adequate expertise in specific areas or because insurers believe that an outside consultant will provide more objectivity. Regulatory authorities and reinsurers sometimes require insurers to provide a consulting actuary's opinion verifying the

accuracy and reasonableness of the staff actuaries' work.

Some actuarial services can also be obtained from advisory organizations, which collect ratemaking data and calculate loss costs for various types of insurance. Advisory organizations supply prospective loss cost information to insurers. Each insurer must then add its own expense factors to determine its final rates, which might differ from the rates used by other insurers who use the same loss costs. The four principal advisory organizations are the following:
1. Insurance Services Office (ISO)
2. American Association of Insurance Services (AAIS)
3. National Council on Compensation Insurance (NCCI)
4. Surety Association of America
A few other specialized advisory organizations exist. Advisory organizations maintain contact with regulatory authorities to facilitate approval of rate filings. Advisory organizations also provide some services that are not actuarial, such as drafting insurance policies.

Ratemaking Process and Terms

This section uses vehicle insurance to illustrate basic insurance ratemaking concepts. Initially, a base insurance rate is established. A base rate is the benchmark price per exposure unit.

Ratemaking Process

Establishing a base insurance rate is a process that involves the following three steps:
1. Calculate the amount needed to pay future claims.
2. Calculate the amount needed to pay future expenses.
3. Add (1) and (2) to determine the insurance rate.

The process sounds simple, but it does present challenges that must be overcome. Determining past claims and expenses is relatively easy, but projecting future claims and expenses is complicated. The following illustration overlooks the complications involved in projecting future claims and expenses and assumes that the future will be exactly like the past.

Ratemaking Illustration

An actuary has been commissioned to calculate the base vehicle insurance rate for the Mas Wholesale Store chain. There are big stores and then there is Mas, so big that everyone drives a self-propelled cart (vehicle) around the store in search of bargains.

Mas Wholesale drivers are exactly alike in driving ability, temperament, and the number of miles they drive when in for a shopping spree. Mas Wholesale has exactly 100,000 self-propelled grocery carts, and they are all exactly alike. The self-propelled carts (vehicles) are insured for exactly the same coverages and limits, which never change. A condition of membership in Mas Wholesale is that each participant purchase insurance on their vehicle.

Driving conditions are uniform throughout the store and never change. Laws governing compensation for vehicle accidents are uniform throughout the chain of Mas Wholesale stores and never change. No economic inflation occurs. The insurers in Mas Wholesale

land have paid exactly $10 million in claims each year for the past ten years. All motor vehicle insurance claims in Mas Wholesale are paid within an hour after the accident.

Step l-Calculate Amount Needed To Pay Future Claims
The first step in the ratemaking process is to calculate the amount needed to pay claims. In the world of Mas Wholesale, the calculations are simple.
Mas Wholesaler's insurers have paid an average of $100 in claims each year for each vehicle insured. Future claims are calculated by dividing the $10 million in annual claims by the 100,000 autos ($10,000,000/100,000 = $100). Because nothing ever changes in Mas Wholesale land, the same claim amounts paid in the past will be paid next year and in every future year. Therefore, to pay future claims, the insurers will need $100 each year for each vehicle insured.

Step 2-Calculate Amount Needed To Pay Future Expenses
The insurers' accountants tell the actuary that they have incurred the following expenses each year for the past ten years:

Loss adjustment expenses	$1,000,000
Acquisition expenses	1,500,000
General administrative expenses	800,000
Premium taxes	200,000
Total expenses	$3,500,000

Dividing the $3.5 million expenses by 100,000 (the number of vehicles) yields a total of $35 in expenses for each auto insured ($3,500,000/100,000 = $35). Therefore, to pay future expenses, the insurers will need $35 each year for each vehicle insured.

Step 3-Add Future Claims and Expense Costs To Determine the Base Rate
The amount needed to pay future claims is $100; the amount needed to pay future expenses is $35. Therefore, the base rate to insure each auto for one year is $100 to pay losses plus $35 to pay expenses ($100 + $35 = $135). The base rate per vehicle is $135.

Ratemaking Factors

Unlike Mas Wholesale, the real world is subject to change. Factors that affect ratemaking include loss reserves estimation, delays in data collection and use, and investment income. All exposure units are not the same. Applicants for auto insurance drive different types of cars. Also, applicants request different policy limits and drive in different geographic areas. So, once the base rate has been determined, insurers evaluate the losses and expenses associated with numerous variables, such as deductible level, policy limits, type of car, and driving record, among others. In evaluating the losses and expenses associated with a particular variable- different deductible levels, for example-the insurer might determine that losses and expenses are greater at one deductible level than at another and adjust the base rate accordingly. Similar evaluations and adjustments can occur for other relevant variables.

These evaluations and adjustments, in addition to allowances for contingencies and profit, allow insurers to determine the appropriate premium for each particular exposure unit. Insurers add loading for contingencies and profit. Charging for contingencies protects the insurer against the possibility that actual claims or expenses will exceed the

projected claims and expenses used in calculating the base rates. If excessive losses or expenses are not incurred, the funds generated by the loading produce additional profit for the insurer.

Ratemaking Terms

Here is a description of basic ratemaking terms as well as covering the ratemaking process used to determine base rates,.
The **pure premium** is the base rate amount required to pay losses. In the example, the pure premium is the $100 per auto needed to pay claims during a given year.
The **expense loading** is the amount added to the base rate required to pay expenses. In the example, the expense loading is the $35 per auto needed to pay the insurer's expenses in providing coverage for one year.
Loss adjustment expenses are the expenses associated with adjusting claims and are examined elsewhere. In the example, loss adjustment expenses are included in the expense loading. Sometimes loss adjustment expenses are included in the pure premium instead; consequently, they are not also included in the expense loading.
The **earned exposure unit** is the exposure unit for which the insurer has provided a full year of coverage. In the example, insurers provide a full year of coverage for 100,000 vehicles each year, so the number of earned exposure units is 100,000.
The **gross rate** is the sum of the pure premium and the expense loading for each exposure unit. In the example, each vehicle is an exposure unit.

Loss Reserves Estimation

Few insurance losses are paid immediately. At any point in time, many losses have been incurred but not yet paid. This section explains how loss reserves are estimated and why it is difficult to estimate incurred losses accurately for any given time period. Insurance rates are based partly on incurred losses. Incurred losses include both paid losses and outstanding loss reserves. Loss reserves are estimates of future payments for losses that have already occurred, whether the losses are reported or not reported. Insurers are legally required to show loss reserves on their balance sheets. Because loss reserves are estimates, they are somewhat imprecise. Nonetheless, rates are based partly on such estimates. So, if loss reserve estimates are too low, rates will probably be too low. If loss reserves are too high, rates will probably be too high.

Assume that rates for auto liability insurance are calculated based on losses that occurred in the most recent three-year period. The insurer's past experience indicates that 25 percent of losses are paid in the year the accident occurs, 50 percent are paid in the second year, and 25 percent are paid in the third year. Chart 5-1 shows the losses for each year in the three-year period, with Year 1 being the earliest year and Year 3, the most recent year.
The information in Chart 6-1 can be interpreted as follows:
The *paid losses* in Column (1) are the amounts paid from January 1 of Year 1 up to and including December 31 of Year 3. The insurer has already paid this money to claimants.
The *loss reserves* shown in Column (2) are the insurer's best estimates, as of December 31 of Year 3, of the amounts it will pay in the future for losses that occurred during each one-year period. Because all losses that occurred in Year 1 have been paid, no loss reserve exists for Year 1. Column (3), which is incurred losses for a given period, is the sum of Columns (1) and (2).

Chart 5-1

Paid Losses, Loss Reserves, and Incurred Losses for 'Mas' Vehicle Liability Insurance- End of Year 3			
Year	Paid Losses	Loss Reserves	Incurred Losses
1	$10,000,000	$ 0	$10,000,000
2	7,500,000	2,500,000	10,000,000
3	2,500,000	7,500,000	10,000,000
Total	$20,000,000	$10,000,000	$30,000,,000

If the insurer in Chart 5-1 insured 100,000 vehicles each year during this three-year period, it provided 300,000 *vehicle-years* of protection. A vehicle-year represents the loss exposure of one vehicle insured for one year. In this case, each vehicle-year for which the insurer has provided coverage represents one earned exposure unit. If the 300,000 vehicle-years are divided into the $30 million of incurred losses, the insurer needs a pure premium-the amount needed to pay losses--of $100 per vehicle per year ($30,000,000/300,000 = $100) to pay its losses during this past three-year period. Unlike the Mas Wholesale example, this example includes not only paid losses but also loss reserves.

If the pure premium indicated by this experience period were used to develop rates for a future year, any inadequacy in past loss reserves would also make future rates inadequate. In theory, an insurer could avoid this problem by waiting for all claims to be paid before using loss data to calculate rates. When all claims incurred during a given period have been paid, loss reserves for that period no longer exist. In practice, however, waiting would create problems. If the rate filing were delayed for several years to permit all claims to be settled, then factors like inflation, changes in traffic conditions, and so forth would have a greater chance of changing the loss exposure. The effects of these factors might be greater than the effects of errors in estimating loss reserves. Chart 5~2 shows the payout pattern reported by one insurer for vehicle liability insurance. In Chart 6-2, Year 1 is the year in which the accidents occurred, Year 2 is the following year, and so forth.

Chart 5-2

Payout Pattern for Vehicle Liability Insurance Year 1 Losses				
End of Year -	Paid Losses to Date	Unpaid Losses Reported	Unpaid Losses IBNR	Estimated Losses for Year 1
1	$5,051,145	$13,837,205	$9,592,239	$28,480,589
2	10,780,845	12,906,866	4,187,646	27,875,357
3	16,036,708	9,058,737	2,036,246	27,131,691
4	19,667,531	6,782,231	79,247	26,529,009
5	22,268,032	4,308,212	0	26,576,244
6	24,714,163	3,136,059	0	27,850,222
7	25,088,249	860,395	0	25,948,644

Paid Losses

The second column of Chart 5-2 shows the actual amount the insurer paid to the end of the year for losses arising from insured events that occurred during Year 1. There were $5,051,145 in losses paid in Year 1 itself. In Year 2, the insurer paid an additional

$5,729,700 for these insured events, bringing total loss payments to $10,780,845. By the end of Year 7, the insurer paid a total of $25,088,249 in losses for insured events that occurred in Year 1.

Reported But Not Paid Losses

The third column of Chart 5-2 shows the insurer's annual year-end estimates of the amounts it will pay for losses for insured events that occurred in Year 1 that have been reported but not yet paid. This amount decreases each year as claims are settled, becoming a relatively small amount of $860,395 at the end of Year 7.

Incurred But Not Reported (IBNR) Losses

The fourth column shows the insurer's *estimates* of future payments to pay losses for insured events that occurred in Year 1 but that have not yet been reported. These estimates are known as incurred but not reported (IBNR) losses. The insurer assumed that all vehicle insurance losses incurred in Year 1 had been reported by the end of Year 5, so the IBNR figure is zero for Year 5 and later. The amounts in the third and fourth columns are estimates of future payments. The amounts in column three are usually based on estimates by claim department personnel of the amounts to be paid on individual claims. The amounts in column 4 (IBNR) are usually calculated by actuaries based on historical data. The amounts ultimately paid seldom, if ever, equal the estimates, and the differences are sometimes substantial.

Incurred Loss Estimate

The fifth column of Chart 5-2 shows the insurer's estimate of the losses incurred during Year 1 as of year's end.. Incurred losses include both paid and unpaid losses. The unpaid losses include both reported and IBNR losses. Therefore, column 5 is the sum of the amounts in columns 2-4.

The fifth column shows that the insurer estimated that at the end of Year 1, it would pay a total of $28,480,589 to settle all of the vehicle liability losses for Year 1. By the end of Year 7, the insurer had reduced that estimate to $25,948,644. With only $860,395 of outstanding losses at the end of Year 7, the estimate in the last line of the exhibit is a more accurate estimate of the loss amounts ultimately payable for Year 1 than the estimate made at the end of Year 1. If the insurer in Chart 5-2 had used its estimated incurred losses at the end of Year 1 for ratemaking purposes, the resulting rates would have been too high by approximately 10 percent:

$$\frac{\$28,480,589-\$25,948,644}{\$25,948,644} = 9.8\%$$

On the other hand, rates based on underestimated losses could lead to inadequate rates, underwriting losses, and possibly even insolvency. Actuaries have methods for correcting consistent errors in estimating future losses. These mathematical iterations are beyond the scope of this book.

Delay in Data Collection and Use

As mentioned, responsiveness is a desirable ratemaking characteristic. Because conditions are constantly changing, any delay between when data are collected and when they are used tends to reduce rate accuracy. A delay inevitably occurs between

when losses are incurred and when those losses are reflected in rates charged to customers. The delay can span several years. During this period, economic or other factors can increase or decrease the rates the insurer should charge if the premium is to reflect the expected losses.

The delay in reflecting loss experience in rates stems from several sources, including the following:

- Delays by policyholders in reporting losses to insurers
- Time required to analyze data and prepare a rate filing
- Delays in obtaining state approval of filed rates
- Time required to implement new rates
- Time period during which rates are in effect, usually a full year

When a rate is in effect for a full year, the last policy issued under that rate could be issued 365 days (one year) after the effective date of the rate filing, and the policy's coverage under that rate continues until policy expiration, yet another year later-

1/1/Yr. 1	12/31/Yr. 1	12/31/Yr 2
Policies first Issued	Last Policy Issue, Yr 1	Expiration, Last Policy Using Yr. 1 Rates

Shown below is a typical schedule for developing, approving, and implementing new rates for auto insurance. The Filing Schedule assumes that the insurer is basing its new rates on its loss experience for a prior three-year period, called the experience period. Data from the experience period are collected and analyzed in the ratemaking process. The experience period in the Filing Schedule begins on January 1 of Year 1. Data are collected for the three-year period beginning on that date and ending on December 31 of Year 3.

Rate Filing Schedule

1/1/Yr. 1	Start of experience period, potential for first loss to be incurred
12/31/Yr.1	Experience Period
12/31/Yr. 2	Experience Period
12/31/Yr. 3	End of experience period
3/31/Yr. 4	Start of data collection and analysis
7/1/Yr. 4	Rates filed with regulators
9/1/Yr. 4	Approval of rates received
1/1/Yr. 5	New rates first used
12/31/Yr.5	These rates no longer used
12/31/Yr. 6	Expiration of last policy using this rate filing

In the Schedule, the analysis phase of the ratemaking process begins only three months after the end of the experience period. Some insurers wait longer to start the ratemaking process in order to permit loss data to mature. Many losses incurred during the experience period would not yet have been reported to the insurer. This Filing Schedule assumes that the new rates will become effective on January 1 of Year 5, one year after the end of the experience period. They will remain in effect until December 31 of Year 5, two years after the end of the experience period. However, the policies issued on December 31 of Year 5 will remain in force until December 31 of Year 6. Thus, the last loss under these rates will be incurred three years after the end of the experience period and six years after the beginning of the experience period, when the

first losses occurred on which the rate calculation was based. Some insurers shorten this process slightly by filing new rates every six months or issuing six-month policies. Others follow a longer cycle.

Investment Income

A property/casualty insurer consists of two distinct operations: insurance operations and investment operations. The insurance operations write policies, collect premiums, and pay losses. The investment operations use the funds generated by the insurance operations to buy bonds, stocks; and other investments to earn an investment profit. Today, insurers commonly consider investment results explicitly in their rate calculations. Some states even require that investment income be considered explicitly. The investment profit earned on a type of insurance depends largely on the loss reserves and unearned premiums reserves. Property losses are usually paid relatively quickly, while liability losses often are not paid until years after losses occur. Consequently, an insurer's loss reserves for liability insurance are usually much greater than its loss reserves for an equivalent amount of property insurance. Because loss reserves are invested to produce income for the insurer, investment profits are more likely to affect liability insurance rates than property insurance rates.

Other Factors

Both loss severity and loss frequency affect an insurer's loss experience during any given period. Economic inflation or deflation during the inevitable delay previously discussed also affects the average cost of a loss (severity). Finally, legislative or regulatory changes such as modification in rules governing claim settlement can affect the number of losses (frequency). Rates calculated without regard to these factors could prove to be grossly inadequate or grossly excessive. These factors are difficult to quantify, but they clearly affect losses. Some factors that affect the size and frequency of losses cannot be identified or measured directly, but their aggregate effect on losses can be determined with reasonable accuracy other actuarial techniques. Insurance rates are also based on the insurer's projected expenses. Like losses, expenses can change over time, and any projected changes must be considered in the ratemaking process. Rather than using past expenses, it is sometimes more relevant to use judgment or budgeted expenses, especially when conditions change dramatically. Ratemakers must also try and allocate general administrative expenses properly among different types of insurance.

Chapter 6 RATEMAKING METHODS

Ratemaking is a process by which an insurance company sets the price it will charge its customers for the insurance it provides. Rates are reviewed and updated periodically in order to sustain competitiveness and remain solvent. Sufficient premium must be collected to pay losses and expenses, and to earn a profit.

There are several steps to the ratemaking process. Pulsar Medical is the name of the insurer in this example. The company has calculated a rate level change starting on January 1, 20x4.

Loss Adjustment Expense and Ultimate Loss

The first step is to estimate the anticipated "ultimate loss and loss adjustment expense ratio" for the year for which premiums are being established. Loss adjustment expenses (LAE) are those expenses that are related to the handling of claims. Claim adjusters' salaries are considered to be loss adjustment expenses. LAE does not include general company-wide expenses that are not claim-related. Sales commissions, taxes, or energy bills at headquarters are not part of LAE. An ultimate loss and LAE ratio is the ratio of ultimate losses and LAE divided by premium. Because it is in the form of a fraction of losses to premium (usually expressed as a percentage), it clearly illustrates the amount of premium "available" to pay the ultimate losses and LAE. Assume that Pulsar Medical estimates an ultimate loss and LAE ratio of 90%. This indicates that for every dollar of premium collected, Pulsar Medical expects 90 cents to go toward paying losses and LAE. Because the 90 cents is not expected to be paid out immediately, but rather over several years in the future, the insurer can earn interest during that time. To account for the investment income that is expected to be earned, Pulsar Medical "discounts" the 90 cents to a "present-day" value of 80.6 cents. If Pulsar Medical sets asides 80.6 cents today, then by the time Pulsar Medical pays its losses and LAE, that 80.6 cents collected in premium will have grown to the 90 cents that Pulsar Medical expects it will need to pay for losses. The process gives us-

$$\frac{\text{Discounted Ultimate Loss and LAE}}{\text{Premium}} = 80.6\%$$

Provision for Expense and Profit

In addition to estimating the ultimate loss and LAE ratio, it is also necessary to estimate what the cost of Pulsar Medical's general, non-claim-related expenses will be. These expenses do include commissions, taxes, utility bills, and other direct and indirect expenses. Historical cost, what these amounts have been in recent years, are used as a basis for determining these expenses. Below is an example of how historical expenses are reviewed in order to select a future expense provision. As with the ultimate loss and LAE ratio, the expenses are displayed as a percent of premium.

Table 7-1

Year	Commissions	General Expenses	Taxes, Licenses and Fees	Total
20x4	10.1%	13.5%	3.1%	26.7%
20x5	10.5%	13.0%	3.1%	26.6%
20x6	11.0%	13.7%	3.0%	27.7%
Averages	10.5%	13.4%	3.1%	27.0%

The table above shows that out of all the premium Pulsar Medical collects for selling medical malpractice liability insurance, 27.0% of it is expected to be spent on non-claim related expenses like commissions, taxes, and rent. Next, Pulsar Medical includes a profit and contingency provision (often, a 5% profit and contingency load). Like the other components, the profit and contingency load is displayed as a percent of premium. A profit and contingency provision is selected in order to recognize a need for profitability, solvency, and a cushion for unforeseen adverse events. Adding the expense ratio of 27% to the profit and contingency load of 5%, Pulsar Medical estimates an expense and profit provision of 32%.

Expenses / Premium	= 27.0%

Profit & Contingency / Premium	= 5%

To this point in the exercise; The first step in determining a rate change indication is to estimate the ultimate loss and LAE ratio. This indicates what percent of premium needs to be collected to pay for losses and LAE. Then, the non-claim-related expense ratio is selected based on a review of historical expense payments. In the above example, the non-claim-related expenses (27% of premium) and the profit and contingency load (5% of premium) sum to 32% of premium. If the non-claim-related expenses and the profit and contingency load add up to 32.0% of the premium, then 68$ is left to pay for losses and LAE after Pulsar Medical has paid its nonclaim- related expenses and accounted for profit and contingency. This 68% is often referred to as the “expected” loss and LAE ratio, or the “permissible” loss and LAE ratio, because it is the percentage of premium that Pulsar Medical expects to have available to “permit” it to pay losses.

Using the information above, if Pulsar Medical collected $1,000 in medical malpractice premium, and had a selected 27% non-claim-related expense ratio and a 5% profit and contingency provision, then $270 would go towards covering expenses, $50 would be set aside for profit and contingencies, and $680 would be leftover to pay for losses and LAE resulting from the insurance sold.

Expected Loss & LAE = 68.0% Premium

Combining the Concepts

The percentage of premium available to pay losses and LAE has been calculated as 68%. Note that at the beginning of this illustration the ultimate loss and LAE ratio was estimated to be 80.6% of premium. What this means is, for every dollar of premium, 68 cents is available to spend on losses and LAE, but that 80.6 cents of loss and LAE will be manifested. Some means must be discovered to put the company into profitability.

The problem is solved by changing the rates to collect more premium to cover the additional loss and LAE that the company expects to experience. In this case, the company would need an 18.5% increase, because 80.6 cents is 18.5% greater than 68 cents. Does Pulsar Medical automatically increase its rates by 18.5%?

Current Rates		**Expected Experience**		
Premium	$1,000	Premiums	$1,000	Rate Increase of 18.5% required (806/680) – 1.0
Profit & Contingency	(50)	Needed to Pay Losses	(806)	
General Expenses	(270)	Total for Profit & Expense	$194	
Total	$320			
Available to Pay Losses	$680			

General Expense Needs	$379
Needed to Pay Losses	806
Premium-	$1,185

Not necessarily. It is common to change the rates by less than the indicated amount, depending on what Pulsar Medical’s competition is doing so that the insurer can keep its customers and remain in business. In this example, rather than an 18.5% increase, Pulsar Medical asks regulators for a 15% rate increase. The data used to estimate a future indicated rate level change is reviewed here. Several concepts are used in the

calculation.

Loss Ratios- First, an estimate of the ultimate loss and loss adjustment ratios (LAE) were made. Components of ultimate loss and LAE ratio are ultimate loss and LAE figures; and premium. Premium is based on Pulsar Medical's data. Ultimate loss and LAE is a bit more complicated and may be based on several different data sources.

Loss and LAE are made up of losses, which are those amounts paid to a claimant; and LAE, which are loss adjustment expenses related to the handling of claims. LAE is itself divided into allocated LAE ("ALAE"); those amounts that can be attributed to a specific claim; and unallocated LAE ("ULAE"), which are amounts that cannot be allocated to a specific claim. An example of ALAE would be the attorney's fees paid to defend a specific claim. An example of ULAE would be claim adjusters' salaries. The development factors that bring the loss and LAE to an ultimate basis are based on Pulsar Medical's company-wide date. A factor also is used to bring ultimate losses to a current basis in "today's dollars." This factor is based on industry-wide data, not Pulsar Medical's data.

Discount Rate- The discount rate is calculated using a selected payout pattern and an interest rate. Pulsar Medical in this case expects to pay its claims over the next eight years. This payment pattern is based on Pulsar Medical's countrywide data. The interest rate used for discounting is selected by Pulsar Medical.

C. *Non-Claim-Related Expenses*
Other expenses that are not related to claims handling such as overhead, taxes, and commissions, can be based on a combination of Pulsar Medical's state-specific countrywide, or industry data. For example, taxes, licenses, fees, commissions, and brokerage expenses may be state specific. General expenses and other production costs factors can be nationwide or industry standards. The same is true of the profit and contingency load of 5% of premium selected by Pulsar.

LAE and Ultimate Loss Estimates

The estimate of all payments that will ever be paid out on that claim is the ultimate loss value. The ultimate loss value of a claim cannot be known for certain until all payments have been made on that claim and the claim is closed. It is difficult to determine when a claim is closed for good. This can take several years for certain claims like medical malpractice claims. The ultimate loss for a *group* of claims is an estimate of all payments that will be made on that entire group of claims. Two types of policies often are offered for medical malpractice exposures

- Occurrence policies
- Claims made policies

Occurrence polices cover all loss occurrences or accidents for a group of policyholders during a year. Claims made policies only cover the losses that are reported to the insurance company for a group of policyholders during a particular year. Occurrence policies usually use accident year loss data (which captures the loss experience associated with all accidents that occurred during a year). Claims made coverage usually use report year loss data (which captures the loss experience associated with all claims reported to the insurance company during a year). The final amount of payments for either group of policies (occurrence or claims made) takes several years before

being known for certain.

Addressing Reserves

Reserves play an important function in the underwriting process. They are estimates of future payments set aside each year and reevaluated over time until the actual payments are made. A key assumption in most actuarial analyses is that past patterns demonstrated in the data will repeat themselves in the future, absent a material change in the associated risk factors discussed below. To the extent a material change affecting the ultimate claim liability is known, such change is quantified to the extent possible through an analysis of internal company data and, if available and when appropriate, external data. Such a measurement is specific to the facts and circumstances of the particular claim portfolio and the known change being evaluated. The process for estimating loss reserves begins by assessing risks and exposures. Data on individual reported claims, both current and historical, is collected including paid amounts and individual claim adjuster estimates, and this data is grouped by common characteristics and evaluated in the analyses of ultimate claim liabilities by product line. Such data is occasionally supplemented with external data such as industry development factors as available and when appropriate. The process of analyzing reserves is undertaken on a regular basis, generally quarterly, in light of continually updated information.

Multiple estimation methods are available for the analysis of ultimate claim liabilities. Each estimation method has its own advantages and disadvantages, with no single estimation method being better than the others in all situations. Generally more methods are used for long-tail product lines because of the difficulty in estimating reserves for these lines. Also, more methods are generally used for recent accident years compared to older accident years because the data available for recent accident years is less mature. The relative strengths and weaknesses of the particular estimation methods when applied to a particular group of claims can also change over time based on the available facts and circumstances. Therefore, the actual choice of estimation methods can change with each evaluation. The estimation methods chosen are those that are believed to produce the most reliable indication at that particular evaluation date for the claim liabilities being evaluated.
Examples of reserving methods utilized the following-

- Paid loss development -payment patterns of prior claims are used to estimate future payment patterns which are applied to current payments to derive an estimate of ultimate losses.
- Incurred loss development -case incurred patterns of prior claims are used to estimate future incurred patterns which are applied to current incurred losses to derive an estimate of ultimate losses.
- Expected loss ratio -loss ratios are determined for recent accident years based on historical accident year loss ratios, recent economic trends and changes in the book of business, including rate levels. The expected loss ratio for each accident year is then applied to the actual earned premiums to calculate ultimate losses.
- Bornhuetter-Ferguson estimates -blends the expected loss ratio method with either the paid or incurred loss development method using weights based on the maturity of the accident year. It combines the completion factor and incurred claims methods by multiplying an *a priori* estimate of total incurred claims by the complement of the reciprocal of the completion factor. What this means is that if X is the completion factor, the incurred claims estimate is multiplied by 1-1/X.

- Claim count and severity estimates -ultimate claim counts and average claim severities are developed separately and then multiplied to derive an estimate of ultimate losses.

For short-tail lines, the paid loss and incurred loss development methods are generally relied on for all accident years, and the Bornhuetter-Ferguson method is also relied on for the most recent accident year. For long-tail lines, all of the above methods may be used for the most recent accident years, and as accident years mature, reliance is shifted to the paid and incurred loss development methods. The merits of each method are evaluated given the facts at hand. An estimate of the ultimate losses is then made based upon the particular method or combination of methods that is deemed most appropriate. In some cases the methodologies produce a cluster of estimates with a tight band of indicated possible outcomes. In other cases, the methodologies produce conflicting results and wider bands of indicated possible outcomes. Management does not believe that such bands constitute a range of outcomes, nor does management determine a range of outcomes.
Reserves for losses and allocated LAE for such exposures as asbestos and environmental issues are especially difficult to determine because of the high amount of legal costs and the extended period of time required to settle these claims. Methods used to estimate these loss reserves can include survival ratio estimates, curve fitting applied to both paid and case incurred losses and allocated LAE, and frequency and severity estimates, which are beyond the scope of this book.

Estimate of losses

The example used will be the paid loss development method. Payment patterns of prior claims are used to estimate future payment patterns. These are applied to current payments to derive an estimate of ultimate losses. The actuary reviews the history of payments that are made on claims that have occurred in a given accident year. The table gives the detail of payments made on accidents that occurred in accident years one through five.

Accident Year	Year 1	Year 2	Year 3	Year 4	Year 5
Year 1	1,900	2,200	2,400	2,600	2,700
Year 2	2,100	2,400	2,500	2,600	
Year 3	2,200	2,600	2,700		
Year 4	2,300	2,700			
Year 5	2,300				

1. *Calculating Age-to-Age Loss Development Factors*
By examining the Year 1 accident year more closely, the following can be seen. At “Year 1 (i.e., as of 12/31/Yr 1), it can be seen that a total of $1,900 has been paid for incidents that occurred in Year 1. At “Year 2” (i.e., as of 12/31/Yr 2), shows that a total of $2,200 has been paid for incidents that occurred in Year 1. The chart continues along continue this way “Year 5”, which is December 31, Year 5 – the latest evaluation. As of 12/31/Yr 5, a total of $2,700 has been paid for incidents occurring in Year 1. The table indicates that between the first and the second year, payments made for Year 1 accidents increased 15.8%, because $2,200 is 15.8% greater than $1,900. It also shows that between the second and the third year, payments made for Year 1 accidents increased 9.1%, because $2,400 is 9.1% greater than $2,200. And so on.

The amount of increase in payments between each age is called “development.” The next table shows this paid development over time for accident year Year 1, and similarly for the other accident years.

Accident Year	Yr 1-2	Yr 2-3	Yr 3-4	Yr 4-5	Yr 5 +
Year 1	1.158	1.091	1.083	1.038	
Year 2	1.143	1.042	1.040		
Year 3	1.182	1.038			
Year 4	1.174				
Year 5					

Each of these factors illustrates how payments develop from Year 1 to Year 2 to Year 3 and so forth, they are commonly referred to as “loss development factors,” or “LDFs.” They are calculated simply by going across the row for a given accident year and dividing the payments made in one year by the payments made in the preceding year Note that there is no way to calculate the last “Yr 5 +” Column. In order to do this calculation, you would need to know the ultimate payments made and all claims are closed with finality. Because there is no way to calculate the last loss development factor, actuaries estimate the additional amount of development that will happen very late in the life of the claims. Typically, this additional development is very small; sometimes, the actuary will expect little or no future development at all. The factor in Year 5 + above may be 1.005, for example

Reviewing the triangle-shaped display of loss development factors above, it can be seen how every accident year developed between 12 months and 24 months, and between 24 and 36 months, and so on. Let’s look, for example, at the development between 12 and 24 months (i.e., between the first and second year). For accident year Year 1, payments grew 15.8%. For accident year Year 2, payments grew 14.3%. For accident year Year 3, payments grew 18.2%. For accident year Year 4, payments grew 17.4%. On average, for all four of these accident years, payments grew by 1.164, or 16.4%.

A reasonable pattern of future development can be extracted by viewing the payments in this way. Look at the estimate of the payments that will be made at “Year 2” for the Year 5 accident year. This would be when the accident year Year 5 is two years old, so it is as of 12/31/Year 6. As such, it is in the future and the payments are as yet unknown. However, based on the other accident years, it might reasonably be expected that payments made on incidents occurring in Year 5 might increase by 16.4% between 12/31/Year 5 and 12/31/Year 6. That is, focusing in on the Year 5 accident year, it is known that $2,300 worth of payments were made in its first year, as of December 31, Year 5. It is also known that the average paid development for the other accident years between Year 1 and Year 2 is 16.4%. As a result it can be expected that by the end of 20x4, payments would increase by 16.4% to a total of $2,677.

Cumulative Loss Development Estimates

These age-to-age loss development factors indicate how many additional payments to expect between ages. They are therefore known as “age-to-age” factors. That is, they will assist in estimating how many dollars will be paid at the end of 24 months, given the dollars that are known to have been paid at the end of 12 months. At some point the company needs to know how many dollars will be paid at the *very* end for all the claims

for a year – three, four, five, ten, or fifty years down the road. There needs to be an estimate of the ultimate value of the total payments made after all the claims that occurred in accident years Year 1-Year 5 have closed with finality.

The age-to-age loss development factors are used directly to calculate the cumulative loss development factors that will estimate the final, ultimate losses. In order to estimate the final ultimate value of a group of claims, the age-to-age loss development factors are each multiplied by the factor immediately after. Successive multiplication by age-to-age loss development factors will estimate accident year ultimate paid losses. In the example above the average age-to-age loss development factors were these-

	Yr 1-2	Yr 2-3	Yr 3-4	Yr 4-5	Yr 5 +
Age-to-Age Factors	1.164	1.057	1.062	1.038	1.005

The cumulative factors, which will bring the paid losses from their estimated amount at any given age to their ultimate value, are shown here-

	Yr 1-Ult	Yr 2-Ult	Yr 3-Ult	Yr 4-Ult	Yr 5-Ult
Ultimate Factors	1.363	1.171	1.108	1.043	1.005

The “Yr 4-Ult.” is the product of the age-to-age factor of Yr 4-5 and the Yr 5-Ult. Factor. That is, the Yr 4- factor is 1.038 times 1.005, which is 1.043. The “Yr 3-Ult.” Is the product of 1.043 (Yr 4-Ult.) times 1.062 (Yrs 3-4), which is 1.108. The “Yr 2-Ult.” is the product of 1.108 (Yr 3-Ult.) times 1.057 (Yrs 2-3), which is 1.171. Finally, the “Yr 1-Ult.” factor is 1.171 (Yr 2-Ult.) times 1.164 (Yr 1-2), or 1.363.

Ultimate Losses Estimate

Designed to take the paid loss amounts for each accident year, these cumulative loss development factors bring those paid amounts to an ultimate basis by factoring in the future as-yet-unpaid amounts. The following table displays the paid losses as of the latest evaluation date – which in this example is as of 12/31/Yr 5 – and the corresponding age-to-ultimate loss development factors

Accident Year	Paid Loss as of 12/31/Yr 5	Cumulative LDF	Estimated Ultimate Loss
Year 1	2,700	1.005	2,714
Year 2	2,600	1.043	2,712
Year 3	2,700	1.108	2,992
Year 4	2,700	1.171	3,162
Year 5	2,300	1.363	3,135

. Again, multiplying the paid losses by the ultimate factors is one way to estimate the total amount of payments that will be made on this group of claims. This includes payments already made, payments that will be made on claims that are known and reported, and claims that have not even been reported yet.

Apply Trending

Trending cam be defined as analyzing past data trends and using actuarial judgment about the future. Loss trending is necessary to project past experience to what it would be during the period in which the proposed rates will be in effect. Inflation typically has the largest impact on severity trend, while changing demographic patterns can also have a significant influence on loss. Changes in technology can affect trending. Examples would include changes weather patterns, extended life spans, technology and its effect on automobiles, building construction, healthcare, and so on. Loss trend can be developed from either actual severity, frequency or pure premium data, or an external index. The actual data, either company data or that of an outside source like the ISO, is better because it reflects what is happening in a particular set of circumstances.

Adjust Levels

When calculating an indicated rate level change, care must be taken so that ultimate losses are stated at the current value that corresponds to the date that the rate change is to take effect. This is trending. For example, if calculating a rate level indication for rates effective on 1/1/04, then it must be assured that the ultimate losses are brought onto the 1/1/Year 6 basis. The Year 1 losses, for example, would have to be inflation adjusted forward so that they are stated in Year 6 dollars. The cumulative loss development factors take into account development on known and unknown claims, but they do not take into account this inflationary factor. After estimating the ultimate losses for each accident year, they need to be trended to a 1/1/Yr 6 basis. Oftentimes, the trend factor to be used is selected based on industry data, not on company data, perhaps even Bureau of Labor Statistics inflation figures. The final result is a trended, inflation adjusted ultimate loss amount for each accident year. When divided by the premium, this yields an “ultimate loss ratio.”

Determining Auto and Homeowners Rates

Calculating a premium for auto and homeowners insurance is a similar but two-part process. First, the underwriting process determines the base rate for the coverage. The base rate for each company will differ, as will the base rate for the different insurers within the company group. Thus, the base rates between Company X and Y will differ, but the base rates between Company X’s preferred and substandard companies will also differ.

Second, the premium calculation involves the application of a series of rating factors to the rate base. Rating factors are the factors that change the base rate because the insurer or state has determined that the factor represents a difference in risk. For instance, a brick home represents a lower risk for fire than a wood frame house, so a discount factor is applied to the base rate for brick homes. Rating factors can cause the rate to increase (surcharges) or decrease (discounts). Rating factors differ by state and by insurer. Common rating factors for auto insurance include coverage amount, territory (usually county of residence), use of car (pleasure only, business use), age of drivers, type of car, amount of deductibles, at-fault accidents, car symbol, surcharges, and various discounts. Common rating factors for homeowners insurance include coverage amount, territory (usually county), type (brick or frame), amount of deductibles, and various discounts.

Double Standard

Rates are developed to meet both legal and actuarial standards. In some instances, the legal and actuarial standards differ. When that occurs, the legal standards take precedence. The common legal standard is that rates must be just, reasonable, adequate, not excessive and not unfairly discriminatory for the risks to which they apply. Rates satisfy that standard if the rate is a sound estimate of future costs of coverage offered and if consumers of the same class and essentially the same hazard are offered the same rates. Rates are generally developed by actuaries working for, or on behalf of, insurance companies. A certified actuary is a person who is a member of the Casualty Actuary Society, but membership is usually not mandatory. Membership in the CAS is based upon passing a series of tests. Ratemaking is a complex subject and activity. Two actuaries analyzing the same data can, and often do, come up with different rate results. Generally, for auto and homeowner insurance ratemaking, the ratemaking analysis is performed by coverage by state. That is, a rate filing contains a number of ratemaking analyses; there is an analysis of the average statewide rate change for each major coverage. The process of estimating future costs generally starts with historical experience. Historical premium, loss, and expense experience are adjusted and projected into the future. Projected premium is then compared to projected costs. If projected premium exceeds projected costs, a rate decrease is indicated. If projected costs exceed projected premium, a rate increase is indicated.

Written premium is the total premium generated from the sale of policies during a given time period. Earned premium is the amount of premium booked by an insurance company due to the passage of time and that would not be returned if the policy is cancelled. For instance, assume that a company sells a one-year homeowners policy for $100 on July 1, Year 6. For Year 6, its written premium would be $100 and its earned premium would be $50. For Year 7, its written premium would be $0 and its earned premium would be $50. Historical premiums are adjusted to future premium in two steps: adjusting to current rate levels and premium trend. The first step is to bring historical premiums to current rate levels. For example, if the rates for a particular coverage increased by 10% on January 1, Year 6, then the historical Year 5 premium must be increased by 10% to reflect the premium that would have been collected at current rate levels. This is important because any rate change indication is applied to current rate levels. The estimation of future premiums may also require the application of a premium trend factor. Average premium per exposure may change for a variety of reasons, most of which affect physical damage coverages. Physical damage coverages are related to the value of the vehicle being insured because the coverage is for the actual cash value, not the replacement value, of the vehicle. As consumers trade in older cars for newer cars, insurance companies gain more premium, all other factors constant. Many insurers increase the amount of coverage in residential property policies automatically each year to reflect inflation in construction costs. Another factor affecting auto physical damage and residential property premiums is changes in deductibles chosen by consumers. As consumers move to higher deductibles, insurance companies collect less premium, all other factors constant. A factor affecting auto liability coverages is changing increased limits selected by consumers or required by law. A shift by consumers to higher limits means additional premium for the insurance company (as well as additional exposure). Factors affecting all coverages are shifts in the distribution of consumers among risk classifications, such as increasing or decreasing numbers of consumers in higher-rate rating territories or higher-rate driver classifications. To

account for expected changes in average premium per exposure, a premium trend factor may be applied to historical premium. Expected future premium is generally the result of premium trend factors applied to historical premiums at current rate levels.

Using Historic Cost

Paid losses are dollars actually paid out for claims during a particular calendar period. Incurred losses are paid losses plus changes in reserves. Loss reserves are estimates of future anticipated payouts for claims. Paid losses are typically paired with written premiums to provide a cash-flow picture of the insurance company's operations. Incurred losses are typically paired with earned premiums to provide a more accurate estimate of the insurance company's results for policies issued during a particular calendar period. Insurance company-specific incurred and paid losses and written and earned premiums by line of insurance are readily available and can give an indication of the insurance company's historical profitability. Additional information is needed to perform the prospective ratemaking analysis. For ratemaking analyses, loss data are organized in three different ways with tradeoffs between the timeliness of the data (i.e., how quickly the data are available after a particular experience period) and how well the losses are matched to the premium and policies under which the losses were paid.

Calendar year data typically represents incurred losses (paid losses and changes in reserves) regardless of when the claim occurred or when the policy was issued. Calendar year data are typically financial data and generally do not effectively match losses with the premium and exposure of the policies under which the losses were paid. Calendar year data are generally not used for ratemaking analyses, but are sometimes used for certain short-tailed lines because the calendar year data may not be significantly different from accident year data. The benefit of calendar year data is that the data are available quickly after the end of the particular time period. A short-tailed line is one in which claims arise and are paid soon after the policy is issued. A long-tailed line is one which claims may arise long after the policy is issued. Examples of short-tailed lines are dwelling coverage and automobile physical damage coverage. Examples of longer-tailed lines are auto bodily injury liability and medical malpractice. The longer the "tail," the longer the insurance company holds the policyholder's money in reserves and the greater the amount of investment income earned by the insurance company.

Accident year data track claims paid and reserves on accidents occurring within a particular year, regardless of when the claim occurred or when the policy was issued. Accident year data do a better job at matching losses with the premium of the policies under which the losses were paid. Accident year data are not available as quickly as calendar year data because time is needed for the accident year data to develop, i.e., time for claims occurring within a particular period to be reported and settled. Policy year data track claims arising from policies issued in the year, regardless of when the accident occurred or when the claim was reported. Policy year data does the best job of matching losses with the premium and exposures of the policies under which the losses were paid. Policy year data take the longest time to develop. Fiscal Accident versus Calendar Accident Years - Calendar accident year data refer to accident year data for a given calendar year, i.e., the accident year from January 1 through December 31. Fiscal Accident year data refer to accident year data for a twelve-month period other than from January 1 through December 31. For example, a fiscal accident year may be the accident year data for the period July 1 through June 30.

Loss Development Factors

Past losses are subject to several adjustments to create ultimate projected losses. The pattern of claim occurrence, reporting and payment - loss development - occurs differently for different coverages. For property coverages, losses are generally reported and settled relatively soon after the accident occurs - short-tailed coverages. For other coverages, such as bodily injury liability, claims may not be made quickly after an accident and claims may take years to settle - long-tailed coverages. The most recent year of loss experience, for example, may not fully reflect the number of claims and amount of losses the insurer will eventually pay for coverage in a particular year. The loss development analysis adjusts historical losses for future development. Note that loss development will be minimal for older historical experience; however, that older experience will not be as reflective of current circumstances as more current experience which may not be fully developed.

As illustrated in previous sections, loss trend attempts to capture past and prospective changes in claim costs, claim frequencies, and pure premium (average loss per exposure). Loss trends may also capture many of the same changes in an insurer's risk profile that are reflected in premium trend. Loss trend data typically consist of earned exposures, paid losses, and paid claims by calendar quarter. These data are all easily obtained quickly after the end of the calendar quarter. However, the paid losses and paid claims are likely to be associated with policies (and earned premium) from earlier periods. If there are no significant changes in the volume of an insurance company's business, then the use of paid losses and paid claims matched to earned premiums will reasonably approximate the actual relationship of losses associated with policies in force during a particular calendar period. The loss trend data is analyzed to determine if changes in claim frequency (the number of claims per exposure) and/or claim severity (the average claim size) are occurring. These historical changes are typically applied to the historical loss data to not only adjust historical loss levels to estimated present loss levels, but also to adjust to estimated levels in the future.

Rate Analysis

The ratemaking analysis first produces average statewide rate change indications by coverage. For example, the ratemaking analysis may initially produce a 5% average statewide increase for bodily injury liability. The insurer then selects the average statewide rate change by coverage it will use or proposes to use. It is common for insurance companies to select rate changes significantly different from the actuarially indicated rate changes. The statewide average rate change is then distributed to the various risk classifications, such as different driver classes, increased limits factors and rating territories. If some parts of the state (rating territories) have better than average loss experience for a particular coverage, these rating territories should get a lower rate change than the statewide average for that coverage. Of course, if one rating territory gets a lower than average rate change, another rating territory must get a higher-than-average rate change. Failure to reflect differences in costs among risk classifications, as well as attempting to charge different rates based upon a rating factor that is unrelated to differences in costs, is unfair discrimination. However, it is important to point out that an actuarially sound rate must be legal. For example, insurance companies are prohibited from discriminating on the basis of race, religion, or national origin. Thus,

even if cost differences based upon these characteristics could be demonstrated, it would be illegal and actuarially improper to treat consumers differently based upon any of these prohibited characteristics. State legislatures routinely pass laws expressing public policy regarding the nature of insurance risk classification. It is important to mention this because risk classifications are not natural or pre-ordained; rather, there are many ways of grouping consumers for the purposes of ratemaking that are fair.

Ratemaking Components

Insurance pricing analysis includes the determination of outstanding charges for all incurred claims. This accountability is a key component of the steps associated with ratemaking. In a competitive insurance market, insurers have little room for error on the premium charged for an insurance contract. This fact makes the steps in the ratemaking process important. Insurers commonly use the following ratemaking steps

Class Rating- This means exposures with similar characteristics are placed in the same underwriting class, and each is charged the same rate. The rate charged reflects the average loss experience for the class as a whole. Class rating is based on the assumption that future loss to insureds will be determined largely by the same set of factors. Major classification factors in life insurance, for example, include age, sex, health, and smoker/nonsmoker. This way, healthy persons who are of the same age and sex and do not smoke are placed in the same underwriting class and charged the same rate for life insurance. Smokers are placed in a different underwriting class and charged higher rates. A major advantage of class rating is that it is simple to apply. Class rating is also called manual rating, since the various rates are published in a rating manual. Class rating is widely used in homeowners insurance, auto insurance, workers compensation, and life and health insurance. There are two basic methods for determining class rates;

1. **Pure premium method** Data Required: Incurred losses, Earned exposure units, Expense Loading. This method is used to develop rates from past experience. It cannot be used without past experience
2. **Loss ratio method** Data Required: Actual loss ratio (calculated from incurred losses and earned premiums) and Expected Loss Ratio (calculated from 100% expense loading percentage. This method is used to modify existing rates It cannot be used without existing rates nor can it be used to determine rates for a new type of insurance.

Judgment Rating- This form of rating means that each exposure is individually evaluated, and that the rate is determined by the underwriter's judgment. This method is used when the loss exposures are so diverse that a class rate cannot be calculated, or when credible loss statistics are not available.
Rates based on experience and judgment. This method is used to develop rates when data are limited. It requires skill and judgment.

Mechanics of Class Rating

Pure Premium Ratemaking Method

The first ratemaking method is the pure: premium method. It can be determined by dividing the dollar amount of incurred losses and loss-adjustment expenses by the

number of exposure units. Incurred losses include all losses paid during the accounting period, plus amounts held as reserves for the future payment of losses that have already occurred during the same period. This way, incurred losses include all losses that occur during the accounting period whether or not they have been paid by the end of the period.

It involves the following three steps:
1. Calculate the pure premium.
2. Calculate the expense loading.
3. Add the pure premium and the expense loading to produce the gross rate.

Step 1 in the pure premium method is to calculate the pure premium. The *.pure premium* (the amount needed to pay losses) is calculated by dividing the dollar amount of incurred losses by the number of earned exposure units.

Assume that in auto collision insurance, 500,000 autos in a given underwriting class generate incurred losses and loss-adjustment expenses of $50 million over a one-year period. The pure premium is determined as follows-

Pure Premium =	$\frac{\text{Incurred losses and loss-adjustment expenses}}{\text{Number of exposure units}}$
=	$\frac{\$50,000,000}{500,000}$
=	$100

Step 2 in the pure premium method is to calculate the expense loading. The *expense loading,* which usually includes a factor for profits and contingencies, is based on the insurer's past expenses, except investment expenses and possibly loss adjustment expenses. If loss adjustment expenses are included in the pure premium, then they are excluded from the expense loading. Investment expenses are not directly reflected in rate calculations.

Step 3 in the pure premium method is to add the pure premium and the expense loading to produce the gross rate. Traditionally, the expense loading for property-casualty insurance has been stated not as a dollar amount but as a percentage of the gross rate. In the example above, the pure premium is $100. Assume the expense ratio is 40%. It would give the following-

Gross rate =	$\frac{\text{Pure premium}}{1 - \text{Expense Ratio}}$
=	$\frac{\$100}{1 - 0.40}$
=	$166.67

Some insurers separate their expense loadings into two components: fixed expenses and variable expenses. Fixed expenses are stated as a dollar amount per exposure unit. Variable expenses are stated as a percentage of the gross rate. For example, the insurer in the preceding illustration might decide that its cost for issuing a policy and collecting the premium is $2.50 per car-year, regardless of premium size, the rating

class, or the rating territory. Its other underwriting expenses vary with premium size, and the total of such expenses equals 15 percent of the gross rate.
The pure premium method can be used to develop rates based on past experience. An insurer that needs to modify its current rates could apply the pure premium method, or it could use the loss ratio method.

Loss Ratio Ratemaking Method

The second of the class rating methods is the loss ratio method. Under this method, the actual loss ratio as compared with the expected loss ratio, and the rate is adjusted accordingly.
The **actual loss ratio** is the ratio of incurred losses and loss-adjustment expenses to earned premiums.
The **expected loss ratio** is the percentage of the premiums that is expected to be used to pay losses.
For example, assume that a line of insurance has incurred losses and loss-adjustment expenses in the amount of $1,700,000 and earned premiums are $2,000,000. The actual loss ratio is .85, or 85%. If the expected loss ratio were .75 or 75%, the rate must be increased 13.3%, as shown by the following-

	Rate Change =	$\frac{A - E}{E}$
Where	A =	Actual loss ratio
	E =	Expected loss ratio
	=	$\frac{.85 - .75}{.70}$
	=	0.133 or 13.3%

If the equation gave a negative number, it indicates that the insurer could lower its rates and still make the desired profit on business subject to these rates. Lower rates would probably also attract additional business that, in turn, would produce greater profits.
The loss ratio ratemaking method cannot be used to calculate rates for a new type of insurance, because neither an actual loss ratio for the calculation nor an old rate to adjust is available. For a new type of insurance, either the pure premium method or the judgment method must be used.

Other Types of Rating

Merit Rating

The purpose of Merit Rating is to provide a pricing mechanism for risks too small to qualify for experience rating to share in the loss experience that they generate. It is a rating plan by which class rates (manual rates) are adjusted upward or downward based on individual loss experience. Merit rating is based on the assumption the loss experience of a particular insured will differ substantially from the loss experience of other insured. Thus, class rates are modified depending on individual loss experience. For example, with workers compensation, merit rating could adjust the premium of qualified insureds based on the number of lost-time claims experienced over the three most recent policy years. There are several other types of what is essentially merit rating in different guises.

Retrospective Rating

Retrospective Rating is a type of individual risk rating system that utilizes the risk's actual losses incurred during the current policy period as the basis for determining its final premium. The plan provides an incentive to the insured to control and reduce losses because the retrospective premium will be the result of losses during the rating period. To the extent that the insured controls losses, there is a reward through lower premiums.

Experience Rating

Experience Rating is a prospective type of individual risk rating system that considers the risk's actual historical loss experience during the preceding policy years. It's foundation is that, when properly adjusted for current and anticipated future conditions, the past is a good predictor of the future. Actual historical loss experience is compared to expected experience for the policy period, with a minimum and a maximum premium charge.

As an example, assume that a manufacturing firm has a general liability insurance policy that is experienced rated. Annual premiums are $55,000 and the expected loss ratio is 40%. If the actual loss ratio over the past three years is 32%, and the credibility factor (C) is .31. The experience rating formula includes a credibility factor, which reflects the degree of confidence placed in the insured's past experience as a predictor of future experience. The greater the employer's past exposures, the more credible the experience and the greater the impact past experience will have in raising or lowering the experience modification.

The firm will receive a premium reduction as follows-

Premium change =	$\frac{A - E}{E}$	x C
=	$\frac{0.32 - 0.40}{0.32}$	x .31
Experience Modification Factor =	-7.75%	

In the example the firm qualifies for a reduced premium for the next policy period. The premium of $50,737.50 ($55,000 x .9225) demonstrates that experience rating provides a financial incentive to reduce losses, since premiums can be reduced by favorable loss experience.

Schedule Rating

Schedule Rating is a type of individual risk rating system that considers characteristics of the insured that are expected to impact future losses, but which have not been incorporated into the experience data, for purposes of determining premium. The characteristics reflect things such as a fundamental change in the exposure to risk, loss control programs, or for risks that are too small to qualify for experience rating. Schedule rating is used in commercial property insurance for large complex buildings such as an industrial plant.

Life Insurance Ratemaking

Life insurers generally develop their own mortality data. For illustration sake, this ratemaking example will use the 1980 Commissioners Standard Ordinary (CSO) Mortality Table as shown in Table 6-1

Adoption of 2001 Mortality Table

Mortality tables of one form or another have been around as long as the life insurance industry itself. They have historically been used in establishing premiums, calculating dividends, calculating reserves, and determining life expectancies and probabilities of survival. The American Experience table was published in 1868 and was in widespread use throughout the life insurance industry until the CSO tables were established. The 1941 CSO table (which was actually introduced in 1948) was the introductory table; the 1958 CSO table, the 1980 CSO table, and now the 2001 CSO table are its successors. While the American Experience table and the early versions of the CSO table were used for many actuarial purposes, the recent versions of the CSO table have become less far-reaching.

Over the last several decades, companies have relied on their own experience or that of reinsurers for the purpose of pricing and actuarial activities. Today, the CSO tables are primarily used for statutory regulation and federal taxation purposes. The tables are used to establish statutory reserves, minimum cash-surrender values, and the maximum mortality rate that can be levied within a universal life policy. Within the tax arena, the tables are used to establish the maximum level of funding permissible in order to qualify as life insurance, and they are used to establish the funding threshold for modified endowment contracts.

The 2001 CSO table will set the standard for calculating statutory and tax reserves, minimum nonforfeiture values, maximum allowable surrender charges and life insurance premium limitations. The new mortality tables generally result in an improvement of 10 percent - 50 percent from comparable rates under the 1980 CSO. Mortality improvement is the largest for nonsmoking males while the rates for female smokers actually increase in the 57 - 73 age group. The 2001 CSO tables display greater mortality improvement at younger ages and have a steeper slope at older ages. This results in larger declines in reserves at younger ages and greater percentage declines in reserves for policies at shorter durations. Accounting for insurance reserves and taxes is discussed in Chapter 13 of this book.

After at least 26 states adopt the CSO table, companies will have up to three full calendar years to implement the mortality standard for tax purposes. From a tax planning standpoint, companies may delay the implementation of new term or whole life products that have lower basic reserves with similar levels of deficiency reserves. Such products may accelerate taxes while contributing strain in the early policy durations. Similarly, asset accumulation products should leverage the maximum funding levels before transitioning to the 2001 CSO for tax purposes.

NSP as Example Base

Life insurance policies can be purchased with a single premium, or with annual, semiannual, quarterly, or monthly premiums. Although most policies are not purchased with a single premium, the net single premium forms the foundation for the calculation of all life insurance premiums. The net single premium (NSP) is the present value of the future death benefit. It is that sum that, together with compound interest, will be sufficient to pay all death claims. In calculating the NSP, only mortality and investment income are considered. Insurance company expenses or the loading element are considered later, when the gross premium is calculated.

The NSP is based on the following assumptions-

- Premiums are paid at the beginning of the policy year
- Death claims are paid at the end of the policy year
- Death rate is uniform throughout the year.

Certain assumptions must also be made concerning the probability of death at each attained age.

Also, since the assumption is made that premiums are paid in advance, and that death claims are paid at the end of the policy year, the amount needed to pay death benefits is discounted for compound interest. It is assumed that the amounts needed for death claims can be discounted annually at 4% compound interest.

Term Insurance The NSP for term insurance is the first (and relatively simple) calculation. The period of protection is only for a specified period or to a stated age. The face amount is paid if the insured dies within the specified period, but nothing is paid if the insured dies after the period of protection expires. The NSP for yearly renewable term insurance is considered first. Assume that a $1000 yearly renewable term insurance policy is issued to a male age 47. The cost of each year's insurance is determined by multiplying the probability of death by the amount of insurance multiplied by the present value of $1 for the time period the funds are held. The 1980 CSO mortality table as shown above indicates that out of males alive at age zero, 9,123,274 are still alive at the beginning of age 47. Of this number, 48,536 persons will die during the year. Therefore, the probability that a person age 47 will die during the year is 48,536/9,123,274. This fraction is then multiplied by $1000 to determine the amount of money the insurer must have on hand from each policyowner at the end of the year to pay death claims. However, since premiums are paid in advance, and death claims are paid at the end of the year, the amount needed can be discounted for one year of interest.

Table 6-1

1980 Commissioners Standard Ordinary Table Male Lives

Age at Beginning of Year	# Living at the Beginning of Year	# Dying During 12-Month Period
0	10,000,000	41,800
1	9,958,200	10,655
2	9,947,545	9,848
3	9,937,697	9,739
4	9,927,958	9,432
5	9,918,526	8,927
6	9,909,599	8,522
7	9,901,077	7,921
8	9,893,156	7,519
9	9,885,637	7,315
10	9,878,322	7,211
11	9,871,111	7,601
12	9,863,510	8,384
13	9,855,126	9,757
14	9,845,369	11,322
15	9,834,047	13,079
16	9,820,968	14,830
17	9,806,138	16,376
18	9,789,762	17,426
19	9,772,336	18,177
20	9,754,159	18,533
21	9,735,626	18,595
22	9,717,031	18,365
23	9,698,666	18,040
24	9,680,626	17,619
25	9,663,007	17,104
26	9,645,903	16,687
27	9,629,216	16,466
28	9,612,750	16,342
29	9,596,408	16,410
30	9,579,998	16,573
31	9,563,425	17,023
32	9,546,402	17,470
33	9,528,932	18,200
34	9,510,732	19,021
35	9,491,711	20,028
36	9,471,683	21,217
37	9,450,466	22,681
38	9,427,785	24,324
39	9,403,461	26,236
30	9,377,225	28,319
41	9,348,906	30,758
42	9,318,148	33,173
43	9,284,975	35,933
44	9,249,042	38,753
45	9,210,289	41,907
46	9,168,382	45,108
47	9,123,274	48,536
48	9,074,738	52,089
49	9,022,649	56,031
50	8,966,618	60,166
51	8,906,452	65,017
52	8,841,435	70,378
53	8,771,057	76,396
54	8,694,661	83,121
55	8,611,540	90,163
56	8,521,377	97,655
57	8,423,722	105,212
58	8,318,510	113,049
59	8,205,461	121,195
60	8,084,266	129,995
61	7,954,271	139,518
62	7,814,753	149,965
63	7,664,788	161,420
64	7,503,368	173,628
65	7,329,740	186,322
66	7,143,418	198,944
67	6,944,474	211,390
68	6,733,084	223,471
69	6,509,613	235,453
70	6,274,160	247,892
71	6,026,268	260,937
72	5,765,331	274,718
73	5,490,613	289,026
74	5,201,587	302,680
75	4,898,907	314,461
76	4,584,446	323,341
77	4,261,105	328,616
78	3,932,489	329,936
79	3,602,553	328,012
80	3,274,541	323,656
81	2,950,885	317,161
82	2,633,724	308,804
83	2,324,920	298,194
84	2,026,726	284,248
85	1,742,478	266,512
86	1,475,966	245,143
87	1,230,823	220,994
88	1,009,829	195,170
89	814,659	168,871
90	645,788	143,216
91	502,572	119,100
92	383,472	97,191
93	286,281	77,900
94	208,381	61,660
95	146,721	48,412
96	98,309	37,805
97	60,504	29,054
98	31,450	20,693
99	10,757	10,757

A present value table or calculation indicates that the present value of $1 at 4% percent interest is 0.96154. Thus, if the probability of death at age 47 is multiplied by $1000, and the sum is discounted for one year's interest, the resulting net single premium is $5.11. This calculation is summarized as follows:

Age 47, NSP

$\frac{48,536}{9,123,274}$	X $1,000	X 0.96154	= $5.11

If $5.11 is collected in advance from each of the 9,123,274 men who are alive at age 47, this amount together with compound interest will be sufficient to pay all death claims.
If the policy is renewed for another year, the NSP at age 48 would be calculated as follows:

Age 48, NSP

$\frac{52,089}{9,074,738}$	X $1,000	X 0.96154	= $5.52

The NSP for a yearly renewable term insurance policy issued at age 48 is $5.52. Premiums for subsequent years are calculated in the same manner. :

Now consider the NSP for a five-year term insurance policy in the amount of $1000 issued to a person age 47. In this case, the company must pay the death claim if the insured dies any time within the five-year period. However, any death claims are paid at the end of the year in which they occur, not at the end of the five-year period. Consequently, the cost of each year's mortality must be computed separately and then added together to determine the net single premium. The cost of insurance for the first year is determined exactly as before, when the net single premium is calculated for yearly renewable term insurance-

Age 47, NSP

$\frac{48,536}{9,123,274}$	X $1,000	X 0.96154	= $5.11

The next step is to determine the cost of insurance for the second year. Referring back to Table 6-1, it can be seen that at age 48, there will be 52,089 dying during the year. Thus, for the 9,123,274 men who are alive at age 47, the probability of dying during age 48 is 52,089/9,123,274. Note that the denominator does not change but remains the same for each probability fraction. Since the amount needed to pay second-year death claims will not be needed for two years, it can be discounted for two years at 5 percent interest. For the second year the following calculation applies:

Age 48, NSP

$\frac{52,089}{9,123,274}$	X $1,000	X 0.92456	= $5.28

For each of the remaining three years the same procedure applies-

Age	Chance of Dying	Insured Amount	PV of $1 at 4%	Insurance Cost
47	$\frac{48,536}{9,123,274}$	X $1,000	.96154	= $5.11
48	$\frac{52,089}{9,123,274}$	X $1,000	.92456	= $5.28
49	$\frac{56,032}{9,123,274}$	X $1,000	.88900	= $5.46
50	$\frac{60,166}{9,123,274}$	X $1,000	.85480	= $5.64
51	$\frac{65,017}{9,123,274}$	X $1,000	.82193	= $5.86
			NSP =	$27.35

If the insurer collects $27.35 in a single premium from each of the 9,123,274 persons who are alive at age 47, that sum together with compound interest will be sufficient to pay all death claims during the five-year period.

Ordinary Life Insurance In calculating the NSP for an ordinary life policy, the same method described for the five-year term policy is used except that the calculations are carried out to the end of the mortality table (age 99). In this example, the NSP for a $1000 ordinary life insurance policy issued at age 47 would be $362.19
.

Net Level Premium

Most life insurance policies are not purchased with a single premium because of the large amount of cash that is required. Consumers generally find it more convenient to pay for their insurance in installment payments. If premiums are paid annually, the net single premium must be convened into a net annual level premium, which must be the mathematical equivalent of the net single premium. The net annual level premium cannot be determined by simply dividing the net single premium by the number of years over which the premiums are to be paid. Such a division would produce an insufficient premium, for two reasons. First, the net single premium is based on the assumption that the entire premium is paid in advance at the beginning of the period. If premiums are paid in installments, and some persons die prematurely, the insurer would suffer the loss of future premiums.

Second, installment payments result in the loss of interest income because of the smaller amounts that are invested. Thus, the mathematical adjustment for the loss of premiums and interest is accomplished by dividing the net single premium by the present value of an appropriate life annuity due of $1. To be more precise, the net annual level premium (NALP) is determined by dividing the net single premium by the present value of a life annuity due (PVLAD) of $1 for the premium-paying period.

$$\text{NALP} = \frac{\text{NSP}}{\text{PVLAD of \$1 for the premium-paying period}}$$

The concept of a life annuity due requires a brief explanation. The annual premium payments can be viewed as being similar to a life annuity, except that the payments flow from the insured to the insurer. Both life annuity payments and premium payments are similar in that both are paid during the lifetime of a specified individual, or for a stated period of time. Both cease on death (unless the annuity has a refund feature), and both are discounted for compound interest. The major exception is that the first premium is due immediately (since premiums are paid in advance), while the first annuity payment is due one payment interval from the date of purchase. For example, if an immediate life annuity is purchased with annual payments, the first payment would be due one year from the purchase date. The annual payments are the equivalent of a regular life annuity plus one payment that is made immediately. However, in order to distinguish the premium payments from the annuity payments, the series of premium payments are referred to as a life annuity due. If the annual level premiums are to be paid for life, such as in an ordinary life policy, the premium is called a whole life annuity due. If the annual premiums are to be paid for only a temporary period, such as in the case of term insurance or limited payment policies, the premium is called a temporary life annuity due.

Term Insurance Consider the net annual level premium for a five-year term insurance policy in the amount of $1000 issued at age 47. Recall that the net single premium for a five-year term insurance policy at age 47 is $27.35. This sum must be divided by the present value of a five-year temporary life annuity due of $1. For the first year, a $1 payment is due immediately. For the second year, the probability that a person age 47 will still be alive at age 48 to make the second payment of $1 must be determined. Table 6-1, indicates that 9,123,274 men are alive at age 47. Of this number, 9,074,738 are still alive at age 48. Thus, the probability of survival is 9,123,274/9,074,738. This fraction is multiplied by $1, and the resulting sum is then discounted for one year's interest (4% in the example). Thus, the present value of the second payment is $0.948. Similar calculations are performed for the remaining three years. The various calculations are summarized as follows:

Age 47	$1 due immediately		= $1.00
Age 48	$\frac{9,074,738}{9,123,274}$	x $1 x .96154	= 0.956
Age 49	$\frac{9,022,649}{9,123,274}$	x $1 x .92456	= 0.914
Age 50	$\frac{8,966,618}{9,123,274}$	x $1 x .88900	= 0.874
Age 51	$\frac{8,906,452}{9,123,274}$	x $1 x .85480	= 0.834
Age 52	$\frac{8,841,435}{9,123,274}$	x $1 x .82193	= 0.796
		PVLAD of $1.00 =	$5.37

The present value of a five-year temporary life annuity due of $1 at age 47 is $5.37. If the net single premium of $27.35 is divided by $5.37, the net annual level premium is

NALP =	$\frac{\text{NSP}}{\text{PVLAD of \$1}}$	$\frac{\$27.35}{\$5.37}$	= $5.09

Ordinary Life Insurance The net annual level premium for a $1000 ordinary life insurance policy issued at age 47 is calculated in a similar manner. The same procedure is used except that the calculations are extended to the end of the mortality table. Thus, the present value of a whole life annuity due of $1 for ages 47 through 99 must be calculated. If the calculations are performed, the present value of a whole life annuity due of $1 at age 47 is $16.95. The net single premium ($362.19) is then divided by the present value of a whole life annuity due of $1 at age 47 ($16.95), and the net annual level premium is $21.37. See the Chart 11-1 for a graphic representation of this interface.

Ratemaking Varies

Ratemaking can vary widely by type of insurance. These variations can result from the characteristics of loss exposures, regulatory requirements, political considerations, and other factors.

Some types of insurance use all ratemaking methods to some degree. In workers compensation, for example, the loss ratio ratemaking method is used to determine the statewide average rate increase or decrease, while the pure premium ratemaking method is used to determine class relativities. Judgment is also used in trending and developing credibility factors.

Chapter 7 LEGAL ISSUES AFFECTING UNDERWRITING

Although the law of large numbers is the ultimate arbiter of underwriting concerns, the law, courts, and lawyers are major components in cases concerning the interpretation of underwriting. In underwriting of insurance, a basic principle is that similar risks should be identified and classified together. The same premium is charged for the level of risk to be assumed by the insurer for each risk. The underwriter must categorize risks based on a number of different characteristics. This discrimination among risks has to be based on recognized actuarial principles or on actual or reasonably anticipated experience. Attempts at social legislation which restricts or prohibits certain types of underwriting/actuarial categorization is an issue for underwriters and the insurance industry. Two issues, privacy and genetics, have been given space elsewhere in the text. There are several other legal issues affecting the underwriting process which will be discussed here.

As stated before, the main idea of this book is that no two tasks are more fundamental to the insurance businesses than the evaluation of risk and the pricing of risk protection. The principal problems of risk from the insurer's standpoint are competitive and financial. The insurer faces the possibility of enrolling a disproportionate share of people who are or will file claims and therefore be costly to insure. The problem then is prices must be adjusted upwards, which is a problem from a competitive standpoint. On the financial side, the insurer runs the risk of underestimating the cost of claims filed by policyholders. This hurts cash flow and the bottom line, bringing on reserve issues and courting the possibility of insolvency. To mitigate these potential threats, insurers work to identify risk-related characteristics of insurance applicants and policyholders and to manage enrollment in a disciplined fashion. This is the basis of underwriting. Health-related risk characteristics such as current and past medical conditions and utilization experience are thought to be well correlated with expected claims' costs and are thus commonly used by insurance companies in the medical underwriting process to define eligibility criteria, separate policyholders into risk-related categories and set premiums corresponding to risk levels. Because the application of risk-related underwriting and classification guidelines almost always results in some policyholders enjoying greater access to insurance coverage, more comprehensive benefits and/or lower premiums than others, they engender concerns about basic fairness and discrimination.

Title V of ADA

The **Americans with Disabilities Act of 1990** (ADA) is a wide-ranging civil rights law that prohibits discrimination based on disability. It affords similar protections against discrimination to Americans with disabilities as the Civil Rights Act of 1964, which made discrimination based on race, religion, sex, national origin, and other characteristics illegal. Disability is defined "a physical or mental impairment that substantially limits a major life activity." The determination of whether a particular condition is a disability is made on a case by case basis. Certain specific conditions are excluded as disabilities, such as current substance abusers and transsexuality.

Title V – Insurance Underwriting

This section of the Americans with Disabilities Act addresses a number of separate issues, including insurance underwriting, ADA coverage of Congress, obtaining attorney fees, and exclusions from the definition of disability.

Title V addresses insurance underwriting practices and has been the subject of litigation. It states that the ADA is not intended to change insurance underwriting practices; however, such practices cannot be used to evade the protections of the ADA. Employers cannot use it to deny a person with disabilities a job because their disability would not be covered or because the cost on insurance would increase. Insurance plans cannot charge different rates, limit coverage available or refuse to insure individuals unless they can prove their actions are justified by sound actuarial principles or based on actual experience. In 1993, the EEOC issued Interim Guidance on American's with Disabilities Act & Health Insurance, covering the EEOC's position on the application of the ADA to disability-based distinctions in employer provided health insurance.

Court Decisions

Appeals Court Says Title III May Cover Contents of Insurance Policy- The U. S. Court of Appeals for the Second Circuit ruled in Pallozzi v. Allstate Life Insurance Co. that the ADA may prohibit disability-based discrimination in insurance underwriting practices. Plaintiffs alleged that Allstate refused to sell them a life insurance policy because they have mental disabilities. Both Mr. & Mrs. Pallozzi were documented as suffering from depression. The district court dismissed the case because the plaintiffs did not say in their complaint that Allstate acted without an actuarial basis in refusing to sell them a policy. On appeal the Second Circuit agreed with a Department of Justice amicus brief in ruling that Title III does not only cover physical access to places of public accommodation but also may cover the decision not to sell a policy. It also ruled that other Federal law does not prevent Title III from covering insurance underwriting, because the ADA specifically relates to the business of insurance. The Second Circuit also ruled on who has the burden of proof under the ADA's limited insurance exemption. To show that an insurance practice is not entitled to the exemption, the plaintiff has the burden of proving that the practice either is inconsistent with State law or is being used as a subterfuge to evade the purposes of the ADA. However, the court ruled that under New York insurance law there was no basis for putting the burden on plaintiffs to prove that the challenged practice lacked an actuarial justification.

Appeals also indicates that ADA's Insurance Exemption has Broad Scope- In Leonard F. v. Israel Discount Bank of New York, the U.S. Court of Appeals for the Second Circuit sharply limited the circumstances in which insurance actions can be challenged under the ADA. Plaintiff sued his employer and an insurance company, challenging a long-term disability insurance plan under which employees can receive benefits until age 65 if they become totally disabled due to physical impairments but for only two years if the disability results from mental impairments. The district court dismissed the Title III claims, holding that the distinction between mental and physical conditions was exempt from challenge under the ADA's limited insurance exemption. The Department of Justice filed an amicus brief on appeal arguing that Title III's coverage is not limited to physical access to places of public accommodation and that it prohibits unjustified discrimination in the terms and conditions of insurance coverage.

The Second Circuit overturned the district court's dismissal of the case but did not specifically address the coverage issue raised in the Department's brief or whether the insurance policy was discriminatory. It did, however, rule that an insurance practice will be protected by the ADA's insurance exemption, whether or not the practice has an actuarial justification, as long as it complies with State law and is not a subterfuge to evade the purposes of the ADA. The court further ruled that an insurance practice cannot qualify as a subterfuge unless it was adopted after the enactment of the ADA.

Functions and Impact of Underwriting and Risk Classification

Disability-based underwriting and risk classifications are employed by insurance companies issuing coverage in both the individual and group segments of the market. Carriers will apply underwriting guidelines and risk classification plans differently in the several business segments they serve. The purpose is to help insurers make eligibility, coverage and rating decisions and to safeguard their competitiveness and solvency. Carriers use underwriting and risk classification to help guide their enrollment, coverage and pricing decisions. In general, carriers apply underwriting and risk classification algorithms as part of their decisions whether to do one of the following-

- accept applicants
- reject applicants
- write comprehensive vs. limited coverage for applicants
- exclude some or all covered benefits
- manage benefits liberally or more restrictively via utilization rules and conditions or financial terms, and/or
- apply a range of risk-related classifications and rate schedules.

Insurers are free to establish their own underwriting guidelines in keeping with their business game plan. As a result, underwriting determinations tend to be subjective and inconsistent on an industry-wide basis. From the policyholder’s perspective, the impact of an insurer’s underwriting and classification determinations can have a tremendous economic effect. Medical underwriting can render an individual uninsurable in the private insurance market or it can drastically limit the scope and depth of benefits an insurer is willing to offer. Viewed from a different perspective, the underwriting process assigns people to progressively higher risk-graded premium categories. The higher premiums lead to the political football of affordability.

Underwriter Binds the Insurer- Waiver and Estoppel

What an underwriter does (or does not do) while underwriting a risk can legally bind an insurer. If an underwriter overlooks or knowingly accepts unanswered questions on a proposed insured’s application, the legal principles of waiver and estoppel could apply. Under these legal principles, the insurer might be held to have waived its right to obtain answers to any unanswered questions on the application. The insurer may also be prevented from using answers obtained later.

Estoppel

Estoppel is defined as a restraint or a bar. It arises where a person has done some act that the policy of the law will not permit him to deny, or where circumstances are such that the law will not permit a certain argument because it would lead to an unjust result.

Estoppel does not require any actual surrender of a known right. Rather, it implies some misleading act, conduct, or inaction on the part of the insurer upon which the insured detrimentally relies. Estoppel is an equitable principle imposed as a rule of law.

What does that last sentence mean? An equitable principle refers to one that brings about justice or fairness. There can be no strategic maneuvering or wrangling in this situation. The insurer must come into the agreement with clean hands. In England the common law was unable to provide a remedy for every injury. So the crown established the court of chancery, to do justice between parties in cases where the common law would not give satisfactory redress. The idea is that equity will find a way to achieve a lawful result when legal procedure is inadequate. Rule of law means that this is a part of law that is applied by the courts. No statutory act by the legislature created estoppel. It is a concept that has developed over time as a part of the legal tradition.

Waiver

Waiver is an intentional and voluntary surrender of some known right, which generally may either result from an express agreement or can be inferred from circumstances. It is the relinquishment of a known right which may result from either the affirmative acts of the insurer or its authorized agents, or from the insurer's nonaction, with knowledge of the applicable facts

These two terms are similar in nature and need to be considered jointly. A clear difference between the two legal theories is confused for the following reasons. Over the years the courts have put forth an effort to counter the unilateral nature of insurance contracts. Insurers control the drafting of the policy language. It can be complex language unfamiliar to the layman. The courts refuse to allow the insurance companies to reap an unfair advantage in litigation with policyholders.

Used Interchangeably

Thus it was in earlier times that any unfair advantage perceived by the courts was branded as one or the other, if not both waiver and estoppel. No regard was given to the accurate usage of the terms. Insurance law litigation dealing with breach of warranty and misrepresentation issues has been called "the happy hunting ground for waiver and estoppel." As important as these concepts are, however, some courts define them inaccurately.

In considering waiver and estoppel, keep in mind that the insurance business is done almost exclusively through agents, and thus waiver and estoppel arguments applied against the insurer most often involve an act or omission by an agent or officer of the insurer who must necessarily be acting within the scope of their authority.

The legal doctrine of waiver applies to those circumstances where an insurer knows it has justifiable grounds for rescission of the policy or defense to any claim on the policy. In spite of this knowledge, the insurer conveys to the insured its voluntary surrender of such a right. This situation usually manifests itself in the form of the agent accepting a premium payment from the insured. This legal doctrine is applicable only in cases where the insurer has actual knowledge of the grounds for cancellation of the contract. A situation in which the insurer is aware of facts that would cause a reasonable person

to inquire and discover the pertinent grounds for rescission or defense on the part of the insurer.

Assume that an agent fails to pass along information affecting the status of a policyholder to the insured. It is still generally held that the knowledge of the general agent of the insurer constitutes knowledge of the insurer. Similarly, an insurance broker is generally considered to be an agent of the insured. That person's knowledge is also attributed to the insurer. On the other hand, information or knowledge of someone acting in the capacity of soliciting agent is not treated in this manner. The knowledge of a person who only solicits and forwards applications does not constitute knowledge of the insurer.

A waiver of rights to contract can come about in two ways:

Express Waiver- The agent conveys to the insured that a situation contrary to the terms of the policy will not be relied upon by the policy issuer as a means of avoidance of its obligations under the policy. An example of this would be leaving the property vacant for an extended time.

Express waiver can also apply to the rights of the insurer. An example would be misrepresentation of information in the application by the insured. The same would apply to a breach of condition precedent to formation of the contract, such as the requirement of payment of the first premium upon delivery of the policy. The same applies to the breach of a condition or warranty during the term of the policy, such as a functioning alarm system.

Implied Waiver-The voluntary surrender of a known right will at times be implied by the courts. Examples of these circumstances include;
▫Acceptance of a premium for future coverage by the agent with knowledge of an existing breach of condition or warranty.
▫Receipt and retention of proof of loss without objection.
▫The exercise of a right under the policy, such as the demand for an appraiser or arbitrator.

The results of silence on the part of the insurer depend on the circumstances. If an insurer learns of grounds for rescission or defense prior to a loss under the policy, it is not sufficient to constitute a waiver unless previous business practices require the insurer to give some affirmative notice to the insured. This situation commonly arises when the insured fails to pay a premium and prior waivers of late premium payments lead the insured to expect that the policy would continue in effect absent any notice to the contrary from the insurer. Some states require the insurer to notify the insured if they are to rely on nonpayment of premiums as a reason for forfeiture.

Estoppel- This generally applies to an insurance contract when an insurer is or should be aware of its right to rescission on the basis of a misrepresentation by the insured. With this condition extant, the insurer expressly or impliedly represents to the insured that the policy is enforceable. The insured is thus unaware of the grounds for policy rescission and relies on the representation of the insurer to his or her detriment. Under the doctrine of equitable estoppel, A makes a representation to B. This person B, having a right to do so, relies on the representation to their detriment. A is now estopped from

denying the truth of the representation, or from taking a position inconsistent with the representation.

To illustrate further, consider that it is a general rule that the doctrine of estoppel does not apply to government or its agencies. This applies not only to true government functions but also when the government is performing functions that have a private counterpart. A farmer applied to the Federal Crop Insurance Corporation for crop insurance on reseeded wheat. The farmer made full disclosure to the agency, paid the premium and the policy was issued. A loss ensued. Payment was denied however, because the FCIC had adopted a regulation against insuring reseeded wheat. This particular regulation had been published in the Federal Register, but the farmer had no knowledge of it. In the case *Federal Crop Insurance Corp. v. Merrill* (332 U.S. 380, 1947), the court acknowledged that a private insurer would be estopped from denying coverage under these circumstances. The principle does not extend to government agencies and coverage was denied.

How can the insured be unaware of the grounds for rescission? The terms and conditions are spelled out right there in the policy. The reality is that courts across the country are split as to whether or not an insured can claim an inculpable lack of knowledge of the grounds for rescission if it is a result of policyholder's failure to read the policy. The insured is not inclined to read the fine print of policies and is often unable to read or comprehend abstruse contractual verbiage. As a result, the courts impose no obligation on the insured. Estoppel is used to counter the insurance company's defense of misrepresentation or breach of condition by the insured. It cannot be used to extend coverage to losses not included or expressly excluded from coverage under the policy.

Promissory estoppel- A promise may be binding even though the promisor may have received nothing by way of an agreed upon exchange for it where made under circumstances which should lead the promisor reasonably to expect that the promisee will be induced thereby to take definite and substantial action in reliance thereon and the promisee does take such action. The basis of the promisor's liability is promissory estoppel, and consideration for the promise is not required. The promisor is estopped from pleading a lack of consideration for his promise where it has induced the promisee to make a substantial change of position in reliance thereon.

The rationale of promissory estoppel is similar to that underlying the principle of a true waiver. A person waives a condition upon which his liability depends when he tells a person who has the power and capacity to bring about the happening of the condition that it will be unnecessary to do so. A party waives the defense of the Statute of Limitations when he induces his creditor to forbear bringing an action by a promise of payment or a promise not to plead the statute as a defense. In these cases the condition or defense is waived because of the justifiable reliance upon the statement that induced a forbearance to act or a change of position.

In some instances the law imposes an agency relationship even when there is no actual consent between the principal and agent. When statements and/or conduct of the principal cause a third party to reasonably believe that an agency condition exists, and the third party relies on the representation when dealing with the purported agent, the principal will be estopped from denying the agency. There is no actual authorization of the agent, only an apparent agency. The result is the same as actual agency. The

principal is bound by the acts of the agent and is estopped from denying the relationship. The appearances of agency must be created by the principal and not by the agent to create an agency by estoppel. Mr. Jones produces business cards showing he is a representative of Zeta Co., owned by Ms. Tran. So long as Ms. Tran has no knowledge of the falsehood, she may deny agency. Persons relying on the ruse created by Mr. Jones are relying on appearances created by Jones, not Ms. Tran.

Parol Evidence Rule

The parol evidence rule emphasizes the importance of avoiding ambiguity in a contract. The rule provides that evidence is not admissible in court to change or modify the terms of a written contract. The contract must clearly reflect the intent of the parties. If a contract is disputed once it's agreed on, usually evidence will not be accepted that will modify the meaning of the contract. The contract must be obvious in its intent.

An insurance agent writes a policy for a baking company. Before the policy is written he tells the baker that the policy does not include business interruption coverage. The baking company reviews the policy when the agent delivers it. The baker finds that the policy does include the business interruption coverage.

After an oven explodes at the bakery, the baker files a claim for property loss and business interruption. The insurer denied coverage. The insurer alleges a misunderstanding concerning the business interruption coverage. It appears that the bakery would prevail. The policy appears to have no contract ambiguity. The parole evidence rule prevents the insurer from denying coverage for the loss.

A contract reduced to writing and signed by the parties is frequently the culmination of numerous conversations, conferences, proposals, counter proposals, letters and memoranda, and sometimes the result of negotiations conducted, or partly conducted, by agents of the parties. At some stage in the negotiations tentative agreements may have been reached on a certain point or points which were superseded, or so regarded by one of the parties, by subsequent negotiations. Offers may have been made and withdrawn, either expressly or by implication, or lost sight of, in the give and take of negotiations that have continued for a period of time.

Ultimately a final written contract is prepared and signed by the parties. It may or may not include all of the points which have been discussed and agreed upon in the course of the negotiations. However, by signing the written agreement, the parties have solemnly declared it to be their contract, and the terms as contained therein represent the contract that they have made. As a rule of substantive law, neither party is permitted subsequently to show that the contract that they made is different from the terms and provisions as they appear in the written agreement.

The word "parol" means literally "speech," or "words." It is a term applied to contracts which are made either orally or in writing, not under seal, which are called parol contracts, in order to distinguish such contracts from those which are under seal and are known as deeds or specialties. The term "parol evidence" refers to any evidence, whether oral or in writing, which is extrinsic to the written contract.

The parties may differ as to the proper or intended meaning of language contained in the written agreement, where such language is ambiguous or susceptible to different

interpretations. To ascertain the proper meaning requires a construction of the contract. “Construction” in this sense does not involve any change, alteration, modification, addition to, or elimination, of any of the words, figures, or punctuation, in the written agreement, but merely a construing of the language in order to ascertain its meaning. While the parol evidence rule precludes either party from introducing any evidence in any lawsuit involving the written agreement which would change, alter, or vary the language or provisions thereof, rules of interpretation or construction permit the introduction of evidence in order to resolve ambiguity and to show the meaning of the language employed and the sense in which both parties used it.

Underwriting Aspects Affecting Legal Position

The following parts of the underwriting process can affect the legal position of the insurer if a plaintiff hails the insurer into court on account of a denial of coverage or benefits.

1.) **Application Review-** It is important that the underwriter avoid inconsistent and incomplete insurance applications. Unanswered questions, ambiguities, and contradictory information must be followed up or the underwriter may be held to have waived its right to that information. Once such waiver is established, the insurer is usually estopped from asserting a defense of material misrepresentation on the basis of the waived information.

2.) **Timely Action-** Courts have held that insurers must act within a reasonable time frame when an application is received for underwriting. In some cases, the ‘negligent delay theory' is limited to those classes of cases where there is a previous understanding that the application is to be binding unless there is notice of rejection. An insurance company may be held liable in damages to an applicant for insurance, where there has been unreasonable delay in acting upon his or her application for insurance, and the question of unreasonableness of the delay is a question of fact for the jury. The determination to be made by the jury is not whether the underwriter could or could not have acted advisedly and intelligently, but whether or not there had been an unreasonable delay in acting upon the application which would necessarily include the question as to whether or not there had been an unreasonable delay in processing the application and compiling the necessary information for the underwriter to act advisedly and intelligently. The underwriter should also remember that from a practical standpoint, the longer an underwriter takes to process an application the harder it is for an agent to place the policy.

3.) **Documentation-** Correspondence, communication, memos and any other information concerning the risk classification process must be documented in the file of the proposed insured. . Documentation not only can help the insurance professional minimize exposure to potential trouble but also can provide the client with additional services. It can help a client understand all of the options as well as the context in which the information is provided. This will help prevent situations in which, for example, an informal conversation is considered an endorsement for additional features under the contract. Documentation is a tangible work product the client can see, store with files and retrieve when needed. Documentation should detail interaction with clients to ensure the client understands the boundaries of the agent’s commitment. It is important to take the time to record the kinds of critical conversations and information shared by the agent and the client that typically go undocumented.

Chapter 8 ECONOMICS OF UNDERWRITING RISK

In the insurance market sales do not specify a price at which customers can buy all the insurance they want. Instead, the insurance industry, like a cafeteria at lunchtime, sells product that consists of both a price and a quantity; a particular amount of insurance that the individual can buy at that price. The exact risk a potential insured represents to a company is not known to the insurer. In fact, high risk individuals, in order to keep down the cost of coverage, will avoid revealing their high risk factors to the insurer.

Company guidelines, developed from statistics concerning these factors' effects on underwriting risk, determine the underwriter's decision regarding the selection and classification of individual proposed insureds. The underwriting decision often must be subjective, however, since the usual guidelines do not always apply to the special set of circumstances presented by a given individual. In such cases, the underwriter's chances of making an error in assessing an individual's anticipated level of risk (be it mortality or driving class) and assigning him or her to the wrong risk class are significantly increased. If too many individuals are assigned to the wrong risk classes, or if too few individuals are accepted for coverage, the company's aggregate underwriting risk results will differ from the actuary's predictions, possibly causing financial losses for the company.

Adverse Selection

In addition to classifying individuals selected for insurance coverage according to the different degrees of risk they present to the company; underwriting helps guard against antiselection, which is also called **adverse selection or selection against the insurer.** This is the tendency of people who have a greater-than-average likelihood of loss to be interested in obtaining or continuing life or health insurance to a greater extent than others. For example, there is a tendency for some people who are in poor health or who work in a hazardous occupation to seek to purchase life insurance. Underwriters must be careful to identify and guard against possible antiselection in order to ensure that all individuals accepted for coverage are placed in the appropriate risk classes so that those insured are charged an equitable premium for the risk they present to the insurer.

Concept of Risk and Return

For financial managers in any type of business, decisions require a trade-off between risk and return. The aim of a successful manager is to obtain the maximum return possible with no more than an acceptable level of risk. As accepting risks is the business of insurance companies, insurance company decision makers need to be especially alert in making the choice between risk and return.

Four major types of risks for insurance companies in their normal operations are excessive claim costs, sales declines, losses in investments and policy loans and cancellations for life insurance companies. Natural disasters can produce excessive claim costs, as can inflation raising claims amounts to unexpected levels or actual losses exceeding estimates. Economic downturns can cause sales declines. Rising interest rates can result in portfolio value loss for bonds and fixed-rate mortgages, and a recession can bring on declines in stock value and defaults on bonds and mortgages. Life insurance companies that offer whole life and endowment policies can face

cancellation and policy loan risks, usually during high interest rate periods.

There are different uses of the term "risk" in insurance. One concerns the outcomes of events depending on whether they can produce losses or both gains and losses. A pure risk or exposure, such as the possibility of an automobile accident, can only produce a monetary loss, while a speculative risk, like playing the lottery, can produce either a loss or a gain. Only pure risks are considered insurable.

A second way of using “risk” in insurance applies to the variability in distribution of losses for a pure or insurable risk. There are also “objective” and “subjective” risks.

Objective risk is the variation of an actual loss from an expected loss, which is directly measurable. It is equivalent to the use of the term in financial theory, with the concept of risk as deviation of actual values from the expected value. Objective risk concerns the tightness of the probability distribution of potential losses and can be measured by the standard deviation of losses.

Subjective risk is an individual's perception of risk. It exists in the mind and is not directly measurable, but can be inferred under utility theory. This theory classifies individuals into three groups-
Risk averters, who dislike risk.
Risk neutral individuals, who are indifferent to risk
Risk lovers, who enjoy risks.

Only risk averse individuals, who wish to avert risks, are willing to buy insurance in order to avoid the uncertainty of future losses. Risk neutral individuals and risk lovers are not good insurance prospects.

Portfolio Theory and Underwriting

Classifying risks in one group or class of risks is similar to portfolio risks in investment theory. The portfolio theory offers a means of reducing risk through diversification. A portfolio is the term applied to a collection of securities. As part of a portfolio, a security is less risky than it would be if held in isolation, because returns of securities in a portfolio are correlated. Most securities are not held in isolation. State law requires insurance companies to hold diversified portfolios of securities. The return and risk relationship of an individual security is analyzed as to how it affects the return and risk of the portfolio. The weighted average return of individual securities in the portfolio gives the expected rate of return of the whole.

If the securities in a portfolio were in perfect negative correlation, all risk would be diversified away, that is, eliminated. In real life, however, most securities are positively correlated. Stock prices or investment returns tend to move up or down together. Thus while combining investments in a portfolio reduces risk, it cannot be expected to eliminate the risk completely. How effective the diversification effort is in the selection of securities with the needed positive or negative correlation to add to the portfolio will determine the amount of risk that will be eliminated.

The total risk of an individual security is judged accordingly in proportion to its diversifiable or nondiversifiable status. The portion of risk which cannot be eliminated by

diversification is known as nondiversifiable, market or systematic risk. What can be eliminated is called diversifiable, company-specific or unsystematic risk. Related to the firm whose securities are being considered, unsystematic risk is caused by such factors as new projects, revised marketing programs or personnel problems. Systematic risk is related to the behavior of the market as a whole and is caused by factors such as inflation or interest rate changes. Since unsystematic risk can be diversified away, the market measures only the portion of the total risk of an individual security that is systematic. Thus the riskiness of a security most important to a prospective investor is not its total risk, measured by standard deviation, but the effect its individual risk will have on the riskiness of the portfolio.

An insurance company handling a number of different lines can be thought of as having a portfolio of insurance investments. The return from underwriting this portfolio would be the weighted average of the underwriting return on each insurance line, and the systematic risk would be the weighted average of the individual lines' systematic risk. Insurance lines, however, are not traded on the market as investment securities are. In practice, indirect methods have to be used for estimating the systematic risk of underwriting various insurance lines.

Two new dimensions of risk are involved in considering the subject from the viewpoint of the individual firm. They are business risk and financial risk. Business risk refers to the riskiness in the specific operations of the firm itself when it is using no debt. Financial risk is the additional risk facing the owners when they decide to use debt. The two kinds of leverage associated with these two types of risk are operating leverage and financial leverage. Operating leverage depends on the effect of sales on the operating income. Financial leverage deals with the effect of debt on the earnings of firm owners. The combination of operating leverage and financial leverage determines the firm's total leverage. The leverage levels depend on the degree of risk the owners of a firm are willing to accept.

Goal of Underwriting

The goal of underwriting is to produce a pool of insureds, by categories, whose actual loss experience will closely approximate the expected loss experience of a given hypothetical pool of insureds. That is, if an underwriter is told that a pool of exposures with specified characteristics (e.g., a pool of brick buildings located no more than 5 miles from a fire station) will produce a specified loss rate of, say, 1 percent of the value of the insured property, then the underwriter should try to place in this pool all the exposures whose characteristics match the specifications. If the underwriter does the job well, the loss ratio of the insureds accepted will closely approximate the expected 1% figure. Putting applicants for insurance in the classification or pool that most closely reflects the real costs of their losses is the essence of good underwriting. Contrary to some opinions, it is not the function of the underwriter to reject so much business that the company experiences no losses. If the underwriter rejects all but the exceptionally safe exposures, he or she has probably turned away much desirable business. The insurance company expects a certain number of losses to occur, and it is just as much an underwriting error to reject profitable business as it is to accept loss-prone business. The function of the underwriter is to accept applicants so that the losses paid by the insurance company closely match the losses that the company expects to pay.

Determining Underwriting Margin

In pricing, insurers determine the size of the assumed underwriting margin on the basis of two primary factors: competition, and the level of underwriting risk taken on by the insurer in offering the product. In a market economy, the more competition a product faces in the marketplace, the smaller the underwriting margin is likely to be. A smaller underwriting margin reduces the price of the product, helping it to be more competitive. As a result of competition among similar insurance products, the insurance product will include a progressively smaller underwriting margin as competition increases (this, of course, assumes a model with no price regulation). An insurer's underwriting risk in connection with a given product can arise from a number of sources, including the following-

No experience or track record for underwriting outcome- With life insurance for example, an insurer takes on a higher underwriting risk when it has on direct experience on which to base its mortality forecasts. An insurer may have no credible mortality experience when it introduces a product in a new market or offers a product it has not previously offered. A new product or product offered in a new market may feature a relatively high underwriting margin as a result of the added underwriting risk.

The length of price guarantees- Pricing pledges are another element of the underwriter's risk. Term life products often feature different premium guarantee periods. Some term products feature only a one-year premium guarantee- others have longer premium guarantee periods of 5, 10, or 20 years. If the price guarantees of a product are limited, the insurer can modify the pricing to account for emerging experience. If a product has extensive price guarantees, then the only protection the insurer has against adverse mortality experience is the underwriting margin for the product. For example, a renewable term product with a five-year premium guarantee would likely have a higher underwriting margin than a term product with only a one-year guarantee and a smaller underwriting margin than a term product with a 10-year guarantee.

Antiselection- The risk of antiselection revolves around the idea that the higher the risk of antiselection, the larger the underwriting margin is likely to be. For this reason, guaranteed-issue products generally have relatively large underwriting margins. The same holds true with convertible or renewable term products. They generally have a higher underwriting margin after the initial period of insurance because insureds in a worse state of health are generally more likely to continue their insurance than insureds who are in good health. All else being equal, those in good health are better able to shop the market for more favorably priced insurance products.

Getting Together the Buyers and Sellers

The job played by insurance agents in pairing buyers with sellers of insurance is a complex, multidimensional process. The role of the intermediary is to scan the market, match buyers with insurers who have the skill, capacity, risk appetite, and financial strength to underwrite the risk, and then help their client select from competing offers. Price is important but is only one of several criteria that buyers consider in deciding upon the insurer or insurers that provide their coverage. Also important are the breadth of coverage offered by competing insurers, the risk management services provided, the insurer's reputation for claims settlement and financial strength, and other factors. In the case of very large risks, coverage is likely to be syndicated over many insurers, requiring considerable skill on the part of the intermediary. For their part, insurers are invited to provide quotations on complex risks. Given the variation among insurers in their available capacity, their market niches, the distribution of risk in their portfolios, the

information they have about the risk, and their relationship with the intermediary who is placing the business, quotations will vary with some insurers possibly declining to quote. This natural variation will include quotations with varying degrees of competitiveness from which the intermediary and client will select. This variation is a natural consequence of a competitive market in which intermediaries seek to span the available insurance market in search of the best placements for their clients. In addition to placement of insurance, insurance intermediaries also help their clients understand and measure their risk, advise them on how insurance can alleviate the costs of risk, help design insurance coverage programs, and assist with claims settlement. Intermediaries often provide other functions such as risk modeling, risk management consulting, and so on.

Missing Puzzle Piece

Insurers depend on accurate information to underwrite and price policies. However, the underwriting information available to insurers is inevitably somewhat incomplete and imprecise. Such informational imperfections lead to a serious problem in insurance markets known as “adverse selection,” which occurs when buyers have more information about their risk characteristics than insurers. Because insurers are not fully informed about individual risk characteristics, some buyers are charged prices that are too low relative to their risk characteristics, while other buyers are charged prices that are too high. Adverse selection occurs when those paying subsidized rates demand more insurance than those paying subsidies, leading to market instability. The costs of adverse selection are borne by individuals and firms who either end up paying premiums that are too high given their risk or being squeezed out of the insurance market altogether.

Brokers and agents help alleviate the adverse selection problem. Intermediaries are usually better informed about the risks of their clients than insurers, and insurers can use this information if a relationship of trust exists with the intermediary. It is widely held that profit-based contingent commissions can align the interests of the intermediary and the insurer in the correct pricing of policies, thus alleviating the problem of adverse selection[2]. With the information transmitted by intermediaries, insurers can compete more vigorously for business and can price more competitively and fairly. In this way, intermediaries assist the flow of information in the insurance market and enhance the efficiency of the market to the benefit of all participants. In most insurance transactions, there is an intermediary, usually an insurance agent or broker, between the buyer and the insurer. The intermediary plays the role of “market maker,” helping buyers to identify their coverage and risk management needs and matching buyers with appropriate insurers. The process through which buyers are matched with insurers is complex and multidimensional. As noted before, it is believed that contingent commissions can be beneficial to policyholders. The agent and insurance purchaser come together under conditions of *asymmetric information*, a situation where one party to the transaction (buyer or seller) has more information than the other[3].

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[2] “Equilibrium in Competitive Insurance Markets: An Essay on the Economics of Imperfect Information” *Quarterly Journal of Economics, Nov 1976*, M. Rothschild, J. Stiglitz

[3] “The Market for ‘Lemons’: Quality Uncertainty and the Market Mechanism” *Quarterly Journal of Economics, Aug 1970,* G Akerlof. Although adverse selection had long been a well-known problem in insurance and other markets, the first important analysis based on economic theory was provided by George Akerlof (1970), who analyzed the problem in the context of the market for used cars. Michael Rothschild and Joseph Stiglitz (1976) then showed how adverse selection might be resolved in the

Frictional Costs

Insurers can take advantage of the fact that the intermediary has valuable information about its clients, and the insurer is interested in extracting this information in order to attract good risks and to price policies accurately. If this can be done, then much of the frictional costs of insurance can be removed; and this will benefit all parties, especially policyholders who would otherwise bear such costs in the form of higher premiums. Frictional costs of capital are similar to the friction in classical mechanics. If an insurance system is defined as a collection of policyholders and shareholders, joined together by the insurance policies, then the frictional cost is a wealth transfer from the insurance system to outside agents. From the point of view of policyholders and shareholders, the wealth disappears like heat dissipation. Underwriting and other expenses are also such wealth transfers. But only costs beyond the ”normal" category or range are considered frictional costs. Examples of frictional costs include the double taxation and agency costs. The investment income of capital is first taxed at the corporate level and then taxed again when shareholders take the realized capital gain. This double taxation creates a cash flow from the insurance system to the government. It a direct cost to the shareholders, and indirectly affects the policyholders through increased premium. Internal or external insurance regulation also contributes to frictional costs.

Risk Information Required

To underwrite insurance and set premiums, insurers require information about risk. From an aggregate viewpoint, the insurer can only stand behind its promises if it is financially sound. This implies that the insurer must be able to measure the risk in its portfolio, spread risk in its portfolio, carry sufficient capital to absorb unexpected claims, and charge premiums that cover the risk that each policy brings to the portfolio. This requires information about each risk, and here the intermediary plays a very important role. For the insurer to make a price quotation for a risk, it needs information about level of risk. Through the underwriting process the insurer can ascertain the probability and potential size of claims. The insurer can carry out a risk survey and this can be expensive; the more the insurer is willing to invest in the survey, the more information it can yield. But even the most comprehensive risk survey will not fully reveal the level of risk. Moreover, certain aspects of a risk (e.g., behavioral traits of the policyholder) simply cannot be directly observed. This means that insurers are never fully informed when they quote for insurance; either because of inherent difficulties in measuring risk or because they simply cannot afford a very expensive survey given their prospects of winning the business. The difficulties in completing insurance transactions with limited information are exacerbated if the parties are not equally informed. The problem of adverse selection is an issue which arises when the policyholder knows more about the risk than the insurer. This occurs in all forms of insurance. The motorist knows more about his/her driving habits and skills than the insurer, the life insurance policyholder knows more about his/her health than the life insurer, and industrial firms know more about their operations and the risks they generate than the insurer.

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context of a market for insurance. Both Akerlof and Stiglitz received Nobel prizes in economics in recognition of their work on asymmetrical information.

What You Don't Know…

Asymmetric information can be used strategically. Since the insurer is unable to differentiate risks, it may try to charge uniform premiums to good (low) risks and bad (high) risks alike. Thus, the good risks will end up subsidizing the bad. This implies that bad risk policyholders will find insurance very attractive and will demand considerable insurance, but the demand for insurance by good risks will be light and might disappear altogether. Thus, asymmetric information "crowds out" the good risks, and insurance is only fairly priced for the bad risks. The insurance market ends up with an adverse selection problem, with the insured population representing primarily the higher risk clients. The costs of adverse selection fall on policyholders, particularly the good risks, who may have to pay excessive rates or accept diminished coverage. Insurers recognize the problems caused by lack of information, and this is reflected in the prices and coverage they offer. But, if adverse selection can be avoided, policyholders will be better off.

Graph 8-1 shows Rothschild and Stiglitz's solution. The insurer offers a menu of policies to all comers. But these policies are designed such that some policies will be appealing to people who know they are of low risk, while other policies are appealing to people who know themselves to be high risk. For example, consider a choice between *policy A*, a high priced policy for auto insurance which provides full coverage at a price that is self-supporting if the policy is purchased by high risks, and *policy B*, a policy offering partial coverage at a price that is self-supporting if it is purchased by low risks. Those who know they are high risks (and know they are likely to crash their car) will tend to choose policy *A* (full coverage), while the low risks will favor policy *B* (partial coverage at a lower unit price). There are other ways the menu can be designed, but the common theme is that low risk policyholders still bear the costs of adverse selection by having to choose between full coverage at unfairly high prices or reduced coverage at fair prices. Because the high risks are offered full coverage at a price which is actuarially fair for their risk characteristics, they choose to buy these policies, and the market stabilizes. Although this may not seem to be a particularly attractive solution for the low risks, it is in fact a considerable improvement over the alternative – Rothschild and Stiglitz show that without the self-selection equilibrium in place, the market can fail in the presence of asymmetrical information and coverage will not be available at all.

Benefit of Commissions

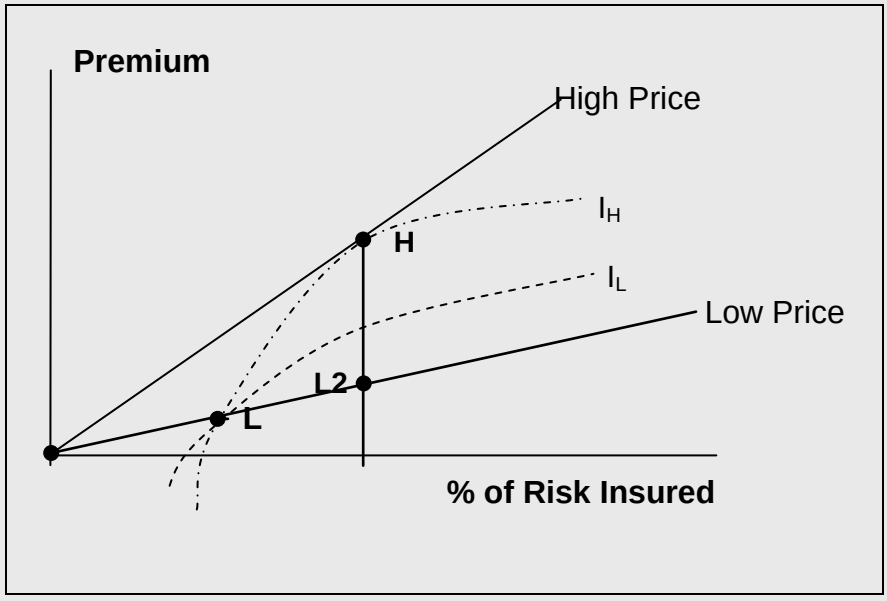
The idea that contingent commissions can actually benefit the policyholder follows quite simply from the model represented by Graph 8-1. The model shows that, when policyholders know their own level of risk, but the insurer does not, market failure will occur if the insurer tries to offer insurance at the average price to both high and low risks. At the average price, high risks are subsidized and low risks pay premiums that are actuarially unfair. As a result, low risks buy less insurance than high risks or drop out of the market, and market failure occurs – premiums will fail to cover claims and the insurer will withdraw from the market. Rothschild and Stiglitz show that the insurer may be able to finesse the informational problem and create a viable market by offering a menu of policies, some of which appeal to low risks and others to high risks.

Buyers are thus induced to "self select" into a set of policies which enable the insurer to cover its costs. In the diagram, the horizontal axis shows how much of the policyholder's risk is insured and the vertical shows the premium rate for coverage. The high price line

shows a premium rate for different levels of coverage for high risks which just allow the insurer to break even. Similarly, the low price line shows the break-even price for good risks. The line labeled "I_H" is the high risk indifference curve. This shows combinations of price and coverage that deliver the same level of satisfaction to a person who knows he is high risk. Clearly, if the high risk person could get a combination of premium and coverage below this line (more coverage at a lower premium) he would be better off. Equivalently, any combination above the curve (less coverage at a higher premium) makes the high risk worse off. The line "I_L" is the indifference curve for a low risk person with a similar interpretation. The fact that this is less steep reflects that the insurance buyer knows they have a lower probability of loss than the high risk, and consequently, he or she is willing to sacrifice more coverage to get a better premium. Now if insurers could identify high and low risks, they could offer policies H and L2 respectively to each type. These policies offer full coverage to each person at a price that is fair given that person's risk. However, if the insurer cannot identify applicants by risk class, it cannot offer these policies (it simply does not know which person to offer the low priced policy).

At this point, the insurer does not know which applicant is low risk and which is high risk. The insurer can, through an analytical process, induce the types to reveal themselves. Suppose the insurer offers the choice between policies "H" and "L" to everyone. Notice they both lie on the high risk indifference curve, so high risk types would not really care which they bought. Indeed, if "L" is drawn a little above this indifference curve, the high risks will choose H. Now the low risk indifference curve is not as steep because these types know they have a lower chance of a loss. Thus, the low risks would prefer "L" to "H". Each has chosen a policy that is priced correctly given the risk level. The snag is that the low risk does not obtain full insurance. This solution requires that low risks "signal" their risk status by being willing to accept lower coverage.

Graph 8-1



While this solution mitigates the adverse selection problem, it does not remove it. Policyholders still pay a price for the lack of full information. In particular, the costs fall on the lower risk policyholders who simply cannot purchase adequate coverage at a

price that reflects their low risk status. This can be seen in the diagram; the low risks would be clearly better off if there was no information problem and they could get policy "L2," which is preferred to "L". There is ample empirical evidence to confirm that insurers do use this type of mechanism to sort out policyholders, and the costs of adverse selection have been widely documented.

Enter the Intermediaries

Now enter the intermediaries. In many cases, particularly for small and medium-size commercial buyers, intermediaries have more information about buyer risk characteristics than the insurers who are asked to provide price quotes. Intermediaries will often do their own risk analysis before structuring an insurance or risk management strategy. Moreover, the intermediary often has a relationship with a policyholder over a number of years and has much more information about the risk than a new insurer who might bid on that risk. Intermediaries can therefore play a very valuable role in transmitting information about the risk to the insurer.

If the intermediary had an adversarial relationship with its insurers, then clearly insurers would be unwilling to accept at face value information about the risk from the intermediary. Insurers would naturally be suspicious that the intermediary would under-represent the risk to obtain better terms for its clients. Thus, informational asymmetries between buyers and insurers would continue to in exist in Graph 8-1, and the adverse selection model depicted would apply. Policyholders bear the costs of this unmitigated adverse selection.

The intermediary and insurer improve their respective position when they can align their interests. This is accomplished through an arrangement where the intermediary's premium-based commission is supplemented by a commission based on the overall profitability of the portfolio of business transacted. When the intermediary receives a profit-based contingent commission, he or she is provided with an incentive to transmit credible information about its clients' risks to the insurer.

The Agent or Producer is Market Maker

The insurance agent or producer carries out the role of market maker. The relative importance of the various functions carried out by the intermediary varies by market segment. For small risks, which do not have risk management departments, the role of the intermediary in recommending the appropriate insurance policies is critically important. The intermediary then places the coverage with an insurer that has the appropriate combination of price, financial strength, and reputation for paying claims fairly. For larger risks with in-house risk management departments, the basics of coverage design usually are carried out by the buyer. The role of the intermediary is shifted away from basic risk management and more toward making recommendations in complex or sophisticated areas of risk management where the buyer may not have expertise. The intermediary's knowledge of the insurance market, including the ability to find appropriate insurers to provide price quotations remains critically important. In the case of very large risks, coverage is likely to be syndicated over many insurers, requiring considerable skill on the part of the intermediary. These activities are undertaken when the intermediary acquires a new client, when a new risk emerges for an existing client, or when an existing client explores new alternatives.

Intermediaries and their clients usually resubmit their business to the market periodically. This can reflect dissatisfaction with the incumbent insurer or simply the desire to periodically check the market to determine whether rival insurers can offer better prices, coverages, or service. Intermediaries usually work with their clients to determine the circumstances and schedule by which existing business will be resubmitted to the market.

The frequency with which accounts are put out for price quotations varies by the size of the account, the importance of services versus price, and the line of business under consideration. Commercial insurance policies can be broadly classified as *service-intensive* and *commoditized*. In service-intensive lines, such as workers' compensation insurance for relatively large risks, the services provided by the insurer are critically important, as they involve loss control and mitigation programs as well as benefits administration and even rehabilitative services. With such accounts, the workers' compensation insurance program is often integrated with the firm's personnel management system. Because the costs of switching insurers in such cases is relatively high, service-intensive accounts are put out to market less frequently than accounts which are less service-intensive. For example, such lines may be shopped systematically only every three to five years. In other lines of insurance, such as commercial property coverages, services tend to be less important and the lines tend to become "commoditized." This implies that buyers care primarily about price, contingent on insurers' meeting a minimum threshold with regard to financial rating and reputation for claims settlement. Commoditized lines of business typically are put out to market every year, and switching of insurers occurs frequently. In addition, large accounts tend to be shopped more frequently than smaller accounts such as, say, commercial multiple peril policies bought by small businesses from independent agencies. The process of searching for insurers and seeking price quotations also varies according to the nature of the risk, the depth and breadth of the market, and the nature of the relationships established between the intermediary and the insurers. For example, to place the liability risks of a biotech company, the intermediary may seek out quotations from insurers that focus on this type of risk, as well as from other insurers with which the intermediary has a successful relationship and therefore can be relied on for competitive price quotations.

Going, Going….

Depending on the size of the risk and the breadth of the market, the intermediary may obtain three or four quotes, as many as a dozen, or even more. The process of seeking quotations and selecting a winner can be compared to an auction. However, the process through which the intermediary places business is significantly different from most auctions. The product the intermediary is placing is inherently multi-dimensional; and the process cannot be compared to simple auctions such as those for oil, telecom bandwidth, or with auctions for a valuable painting where the only thing the seller cares about is the price. Insurance is a complex product, for which price is only one of the attributes that are important to the buyer. This complexity shapes the quotation and selection process. The intermediary generally makes an attempt to "standardize" the terms offered by competing insurers. (E.g., the intermediary specifies the coverage sought; i.e., the deductibles, policy limits and the perils covered.) Indeed the intermediary might seek specific policy wording. However, the offers made by competing insurers are often "counteroffers," which deviate in significant dimensions

from the terms originally specified. Thus, one insurer might be willing to offer coverage with lower policy limits; another may offer the requested limits but with different policy wording; another may exclude certain properties from coverage; etc. This variation in the coverage offered is compounded by heterogeneity in the financial condition and reputation of the responding insurers. Offers are likely to be obtained from insurers with different credit ratings and with differing reputations for claim settlement. And, of course, the quotations will vary by price. Thus, the intermediary and clients are presented with a portfolio of competing offers which cannot be compared along only one dimension, i.e., price. The selection of the winning offer cannot be reduced to a simple formula. The best offer is likely to represent a combination of judgments to be made and must reflect the risk tolerance of the client. The efficiency and fairness of this process cannot be verified by a simple rule such as “did the lowest price win?” Rather, it rests on the integrity of the process itself.
Was there an appropriate selection of insurers? Was information properly transmitted?
Were bids fully communicated to the client?
Were the intermediary’s actions and compensation structures transparent?
Were all other relevant factors considered?

With such a cacophony of information flying about, It is possible and normal for uncompetitive bids to arise from the natural frictions and imperfections of the bidding process. A look at the insurer’s price quotation process is warranted to shed light on the development of insurance pricing

Accurate Information to Quantify Risk

Insurers depend on accurate information to underwrite and price policies. However, the underwriting information available to insurers is inevitably somewhat incomplete and imprecise. Such informational imperfections lead to the problem in insurance markets known as adverse selection. As the reader knows, this situation occurs when buyers have more information about their risk characteristics than insurers. Because insurers are not fully informed about individual risk characteristics, some buyers are charged prices that are too low relative to their risk characteristics, while other buyers are charged prices that are too high. Adverse selection occurs when those paying subsidized rates demand more insurance than those paying subsidies, leading to market instability. The costs of adverse selection are borne by individuals and firms who either end up paying premiums that are too high given their risk or being squeezed out of the insurance market altogether.

Insurance intermediaries help alleviate the adverse selection problem. Intermediaries are usually better informed about the risks of their clients than insurers, and insurers can use this information if a relationship of trust exists with the intermediary. With the information transmitted by intermediaries, insurers can compete more vigorously for business and can price more competitively and fairly. Profit-based contingent commissions can be used to align incentives between intermediaries and new insurers, ensuring that new firms receive a flow of business with favorable underwriting characteristics. Thus, intermediaries have an important role to play in enhancing the efficiency of the insurance market to the benefit of all market participants. An aggressive growth posture obviously means a higher proportion of a book of business is made up of new business, which implies higher variance for the combined ratio, therefore greater underwriting risks. An insurance company’s pace of growth depends on how much risk it can retain. Without proper risk management, an aggressive growth strategy cannot be

sustained over a long period of time, and may result in significant underwriting losses. Many insurers operate in a cycle of rapid growth, followed by high loss ratios, followed by rate increases to alleviate underwriting losses, followed by declines in new business because the rate is not as competitive as before.

Growth Rates and Underwriting Risks

The following is taken from an article published by the Federal Reserve-Dallas. It helps explain relationship between growth rates and underwriting risks.

Southwest Economy

Issue 4, July/August 2002
Federal Reserve Bank of Dallas

Insurance: A Risk to the Economy?

Most people don't appreciate insurance until they need it. Or can't get it. Last year was a difficult one for the insurance industry. An unprecedented surge of catastrophic claims left the industry reeling.[1] In response to the unexpected rise in claims and weaker investment opportunities, the insurance industry cut back coverage and sharply increased premium rates.

Insurance is a valuable financial tool that boosts economic activity. By purchasing insurance, individuals and businesses share the risk of making investments and engaging in activities that they perceive as too risky to pursue on their own. Homeowners, automobile drivers, doctors and businesses can pay regular premiums to reduce the expense of an unpredictable event.

The insurance industry is an integral part of the economy. Insurance is required for operating a business and, in most states, for purchasing a home or automobile. Increases in insurance costs are taking a bite out of corporate profits and consumers' paychecks. Recent changes in the industry have made this financial tool more expensive and more difficult to obtain, which could reduce investment and slow the economic recovery.

The Economics of Insurance: Life's a Gamble

Most economic activities involve risk. Our society has developed mechanisms for reducing the amount of risk people bear from day to day. Futures markets, hedge funds and insurance are examples. By transferring risk to others, these mechanisms make it easier for people to make decisions when there is uncertainty.

To purchase insurance, an individual or business pays a fixed price to an insurer, who promises to pay a lump sum or periodic payments if a covered event happens within a specified time period (usually 12 months). For example, property owners buy insurance that will compensate them for a future loss, such as fire or theft. The risk of loss is transferred from the property owner to the insurance company.

The cost of the insurance—the premium—is calculated so that, on average, it is sufficient to pay the present value of expected future claims plus administrative costs and profit. Actuaries estimate the risk involved and determine the appropriate premium based on the level of risk.[2] Some risks are more difficult to estimate than others. Historical loss data are a good predictor of claims for personal automobile insurance, but catastrophic risks, such as earthquakes and hurricanes, are very difficult to predict.

Other losses, such as mold, may not be envisioned as a potential large risk when insurers originally price the coverage. Still other losses emerge from court decisions that make insurance companies liable for claims the companies did not anticipate and did not price into the premium.
Insurers are able to bear the risk of unpredictable events by pooling a diversified group of customers. To insure its own risk portfolio, the company issuing the policy typically sells a percentage of the risk to other insurance firms, referred to as reinsurance companies. Diversifying or spreading the risk to reinsurers helps protect the insurer from catastrophic losses.
Insurance coverage is available for many types of activities. Individual coverage can be purchased for life, disability, property, auto and health, while businesses can be insured for property, workers' compensation, catastrophic events and business interruption.[3] In recent years, firms have found innovative ways to use insurance to hedge risk. Insurance is available to share the risk of potential lawsuits for company officers and directors. It can hedge losses a business might incur if it were unable to function.
An important source of income for insurance companies—particularly property casualty and life insurers—is the profits earned from invested premiums. Often companies use anticipated profits from investment earnings to reduce premiums to gain market share. Because investment earnings can be substantial, operating losses—that is, covered claims —often exceed premium income for several years. For property casualty insurers, covered claims have exceeded premium income every year for the past 25 years (See Chart 1).

The link between industry income and premiums contributes to an insurance cycle. This cycle is affected by many factors, including price competition, the availability and affordability of reinsurance, regulatory pressures, unplanned classes of losses and economic conditions. Insurance companies must maintain an adequate level of income or capital to cover potential claims. When insurance premium prices come down due to a limited number of claims or lucrative investment opportunities or both, the level of capital grows and the insurance market is referred to as "soft." High levels of capital and weak demand can lead to loosened underwriting standards. Competition drives down premium prices, and coverage is easily available.
When premiums are driven upward, such as when there is a large number of claims or a poor return on investment, capital may be depleted and the insurance market becomes "hard." When the market hardens, premiums rise and coverage levels decline substantially until capital is replenished, at which time the market softens and the cycle resumes.

The cycle most directly affects property casualty insurers, but it can influence other parts of the insurance market to the extent that a firm chooses to use income from one industry segment to finance expansion in others.

Insurance premium rates reflect financial market conditions as well as underwriting risk because of the extent to which insurers—particularly property casualty insurers—rely on investment income. When interest rates are low, some argue, insurers may not be

experiencing a true "underwriting crisis" based on mispricing the risk but rather a mis-estimation of the investment income returns used to offset insufficient underwriting. There may be some correlation between property casualty insurance hard markets and trough periods in financial markets.

The Insurance Industry's Own Catastrophic Event

The 1990s were good years for those wanting to purchase insurance and the companies that sold it. Insurance was readily available and relatively inexpensive. A raging bull market led to a soft insurance market, in which insurers used healthy investment returns to hold down premium costs. Flush with cash, insurance firms sought market share with less concern for risk.

The insurance market began to harden in 2000, when growth in investment profits waned with the economy. By early 2001, faced with growing claims, the industry was having difficulty offsetting operating losses with investment income. Lower interest rates weakened earnings from bond holdings, and stock earnings plateaued. As capital was depleted, insurers were forced to evaluate risks more carefully, and premium rates began to rise to more fully reflect potential losses.

Then an unexpected thing happened to an industry that specializes in helping others deal with the unexpected. In the midst of a hardening insurance market, the industry had to absorb an unprecedented catastrophe: September 11. The terrorist attack was the largest single event in any segment of the industry, including health, workers' compensation, property, airline liability and the reinsurance market. Catastrophic losses in 2001 were the highest in the industry's history.[4] Underwriting losses in the property casualty industry (claims and administrative fees exceeding premiums) were roughly $50 billion in 2001 (*see Chart 1*). For the first year ever, insurers paid more for claims than they collected from premiums plus investment earnings.

The large volume of 2001 claims and mounting investment losses drained industry capital and accelerated the firming of the insurance market. Some of the investments that had produced hefty gains a couple years earlier were now reporting substantial losses.[5] Administrative costs swelled, particularly for property and casualty insurers, because they need more information from policyholders to properly classify risk. While insurers must reassess the probability of terrorism and other catastrophic events, they must also take more care in classifying other risks. During the 1990s quest for market share, it was easier for insurance companies to absorb unexpected losses. Problems with rising noncatastrophic losses, such as mold and medical liability claims, were also easier to absorb.

Insurance and reinsurance firms today can no longer absorb as much risk as they did in the 1990s, both because the industry has fewer assets to back the risk and because the risks that previously seemed remote are more probable now than they were only a few months ago. Terrorism coverage has become particularly problematic for insurance firms and businesses. Insurers are generally unwilling to issue policies for risks they believe are undiversifiable. While limited coverage is available at high prices, most reinsurance companies no longer offer terrorism coverage, citing an inability to project the frequency and magnitude of potential losses. This leaves primary insurance companies with no way to insure their risk, while they are locked in to existing policies

until renewal. Further, in some states regulators require insurers to offer coverage for certain risks, such as workers' compensation and fire, irrespective of their cause; exclusions for terrorism are not allowed.

To build capital and rein in exposure, some firms have stopped issuing policies for certain types of coverage. Others have drastically reduced coverage or are issuing policies only to customers perceived as low risk.

A Damper on the Economy?

Insurance helps facilitate economic investment by encouraging people to take risky but economically beneficial actions. Consumers and investors benefit from the good fortunes of the insurance industry. When insurance firms do well financially, the some of the investment earnings can be used to reduce premiums, making insurance a widely available and relatively affordable financial tool for all consumers.

The recent sharp rise in premium prices is being felt across the economy, reducing consumer spending and business investment. For several months, the Federal Reserve's Beige Book has been reporting widespread concerns about insurance costs from businesses in all economic sectors. Recent surveys by the National Federation of Independent Business report that the cost and affordability of insurance are among the most important problems facing small businesses. According to the Employment Cost Index, employers' share of health insurance premiums resumed its acceleration in 2001, jumping 10.5 percent in the first quarter of 2002 (*Chart 2*). Hefty premium increases are pressuring the bottom line for many policyholders, particularly those located in high-risk areas or perceived as exposed to high-risk activities. However, the insurance cost increases remain a relatively small part of consumer spending.
The economy is also being affected by reduced use of this financial tool, particularly for property insurance, although the magnitude of this is unclear. Because of higher premiums and more rigorous underwriting standards, some policyholders are settling for reduced coverage; others are unable to obtain any coverage. In these instances, several outcomes may occur. Investors may continue to engage in the activity and bear more risk of loss themselves. Or, unable to reduce the investment risk, they may choose not to invest at all. In both cases, the effects of the recent insurance market changes may take time to reverberate through the economy.

Investors who choose to bear more risk themselves will, in effect, be self-insuring. These individuals or firms may take actions to reduce the size or severity of potential losses. For example, they may purchase a new sprinkler system or burglar alarm, or they may set aside a fund to cover losses. These expenses could be considered part of the rising cost of insurance. If successful, they may not result in any additional effect on the economy. However, the rise in self-insurance is likely to lead to an increase in uninsured losses if preventive measures are not taken or are not sufficient. Expenses from uninsured losses will show up on corporate balance sheets and in homeowners' budgets as firms and families absorb unpredictable losses.

Investments that are being foregone in the new insurance climate may do even more economic damage. Lack of insurance is impairing certain business transactions, particularly those requiring aviation liability insurance and some types of property insurance. The lack of affordable insurance is causing even more deals to fall by the wayside. Again, it is difficult to determine the total effect of these disrupted transactions. But one thing is clear: They would likely have been successful in a softer insurance market. And without them, economic activity in the United States is less than it otherwise would have been.

Chapter 9 PRIVACY ISSUES AND UNDERWRITING

To perform the job, an underwriter needs accurate information. But a question arises: At what point does the underwriter's need for information conflict with an individual's right to privacy? The conflict between these two positions has been receiving much deserved attention.

The more accurate the information the insurer has, the fairer the premium charges can be. But does an insurer have the right to determine if an insured uses marijuana, or is a sexual deviate, or is an adulterer? To what length must an insurer go to protect the confidentiality of its information? Should all information be routinely passed along to the MIB or Equifax? What rights should a consumer have to correct any mistakes or distortions of information? These are all difficult questions, and class discussions with students over the past few years have convinced me that each of us would probably draw a slightly different line between the insurer's need to know and an individual's right to privacy, between what is an acceptable business practice and what is not acceptable.

Privacy Protection

The U.S. Congress created the Privacy Protection Study Commission to investigate many different aspects of the questions we have just raised. The committee's report, *Personal Privacy in an Information Society,* is interesting and informative, although it deals with a broader scope of transactions than just insurance. The report came out in 1977, but the issues it deals with are still pertinent today. In many ways, the report anticipates the issues that are faced in the tradeoff between privacy and the insurer's need to know. Where is the line drawn between conflicting rights in a democratic society?

Personal Privacy in an Information Society

This is material from the Preface to the <u>Personal Privacy Report</u> of the Privacy Protection Study Commission--

Issues of public policy rarely, if ever, emerge on the political scene fully developed and fully articulated. Rather, they result from gradual changes in the social and economic environment, which are then identified and intensively debated. This has been the pattern with the subject of this report. The relationships between individuals and various record-keeping organizations have been developing over a long period of time. An analysis of these relationships and their consequences for personal privacy lie at the heart of the findings and recommendations in this report.

In seeking to address the privacy issue as it emerges in a variety of settings, the Commission has constantly sought to examine the balance between the legitimate, sometimes competing, interests of the individual, the record-keeping organization, and society in general. Each of these interests has been weighed carefully, and, the Commission believes, given fair and forthright treatment. While broad principles did emerge as our investigations proceeded, for our report we decided not to center our recommendations on an omnibus approach. We concentrated, instead, on recommendations for the specific record-keeping relationships that characterize each of the areas we studied. It was clear to the Commission that historic development and current realities required each area to be dealt with separately…….

Introduction

This is Chapter 1 of the Personal Privacy Report of the Privacy Protection Study Commission--

This report is about records and people. It looks toward a national policy to guide the way public and private organizations treat the records they keep about individuals. Its findings reflect the fact that in American society today records mediate relationships between individuals and organizations and thus affect an individual more easily, more broadly, and often more unfairly than was possible in the past. This is true in spite of almost a decade of effort to frame the objectives of a national policy to protect personal privacy in an information-dependent society. It will remain true unless steps are taken soon to strike a proper balance between the individual's personal privacy interests and society's information needs. In this report, the Privacy Protection Study Commission identifies the steps necessary to strike that balance and presents the Commission's specific recommendations for achieving it. This introductory chapter briefly describes the problem and focuses and defines the objectives of a national policy. It also weighs major competing values and interests and explains how the Commission believes its policy recommendations should be implemented.

RECORD KEEPING AND PERSONAL PRIVACY

One need only glance at the dramatic changes in our country during the last hundred years to understand why the relationship between organizational record keeping and personal privacy has become an issue in almost all modern societies. The records of a hundred years ago tell little about the average American, except when he died, perhaps when and where he was born, and if he owned land, how he got his title to it. Three quarters of the adult population worked for themselves on farms or in small towns. Attendance at the village schoolhouse was not compulsory and only a tiny fraction pursued formal education beyond it. No national military service was required, and few programs brought individuals into contact with the Federal government. Local governments to be sure made decisions about individuals, but these mainly had to do with taxation, business promotion and regulation, prevention and prosecution of crime, and in some instances, public relief for the poor or the insane. Record keeping about individuals was correspondingly limited and local in nature. The most complete record was probably kept by churches, who recorded births, baptisms, marriages, and deaths. Town officials and county courts kept records of similar activities. Merchants and bankers maintained financial accounts for their customers, and when they extended credit, it was on the basis of personal knowledge of the borrower's circumstances. Few individuals had insurance of any kind, and a patient's medical record very likely existed only in the doctor's memory. Records about individuals rarely circulated beyond the place they were made.

The past hundred years, and particularly the last three decades, have changed all that. Three out of four Americans now live in cities or their surrounding suburbs, only one in ten of the individuals in the workforce today is self-employed, and education is compulsory for every child. The yeoman farmer and small-town merchant have given way to the skilled workers and white-collar employees who manage and staff the organizations, both public and private, that keep society functioning. A significant consequence of this marked change in the variety and concentration of institutional

relationships with individuals is that record keeping about individuals now covers almost everyone and influences everyone's life, from the business executive applying for a personal loan to the school teacher applying for a national credit card, from the riveter seeking check-guarantee privileges from the local bank to the young married couple trying to finance furniture for its first home. All will have their creditworthiness evaluated on the basis of recorded information in the files of one or more organizations. So also with insurance, medical care, employment, education, and social services. Each of those relationships requires the individual to divulge information about himself, and usually leads to some evaluation of him based on information about him that some other record keeper has compiled.

The substitution of records for face-to-face contact in these relationships is what makes the situation today dramatically different from the way it was even as recently as 30 years ago. It is now commonplace for an individual to be asked to divulge information about himself for use by unseen strangers who make decisions about him that directly affect his everyday life. Furthermore, because so many of the services offered by organizations are, or have come to be considered, necessities, an individual has little choice but to submit to whatever demands for information about him an organization may make. Organizations must have some substitute for personal evaluation in order to distinguish between one individual and the next in the endless stream of otherwise anonymous individuals they deal with, and most organizations have come to rely on records as that substitute. It is important to note, moreover, that organizations increasingly desire information that will facilitate fine-grained decisions about individuals. A credit-card issuer wants to avoid people who do not pay their bills, but it also strives to identify slow payers and well intentioned people who could easily get into debt beyond their ability to repay. Insurance companies seek to avoid people whose reputation or life style suggest that they may have more than the average number of accidents or other types of losses. Employers look for job applicants who give promise of being healthy, productive members of a work force. Social services agencies must sort individuals according to legally established eligibility criteria, but also try to see that people in need take advantage of all the services available to them. Schools try to take "the whole child" into account in making decisions about his progress, and government authorities make increasingly detailed evaluations of an individual's tax liability.

Each individual plays a dual role in this connection-as an object of information gathering and as a consumer of the benefits and services that depend on it. Public opinion data suggest that most Americans treasure their personal privacy, both in the abstract and in their own daily lives, but individuals are clearly also willing to give information about themselves, or allow others to do so, when they can see a concrete benefit to be gained by it. Most of us are pleased to have the conveniences that fine-grained, record-based decisions about us make possible. It is the rare individual who will forego having a credit card because he knows that if he has one, details about his use of it will accumulate in the card issuer's files. Often one also hears people assert that nobody minds organizational record-keeping practices "if you have nothing to hide," and many apparently like to think of themselves as having nothing to hide, not realizing that whether an individual does or not can be a matter of opinion. We live, inescapably, in an "information society," and few of us have the option of avoiding relationships with record-keeping organizations. To do so is to forego not only credit but also insurance, employment, medical care, education, and all forms of government services to individuals. This being so, each individual has, or should have, a concern that the

records organizations make and keep about him do not lead to unfair decisions about him…….

The Insurance Relationship

This is material from Chapter 5 of the <u>Personal Privacy Report</u> of the Privacy Protection Study Commission--

……. Because the chief functions of an insurer-underwriting and rating risks and paying claims-are decision-making processes that involve evaluations of people and their property, the insurance industry is among society's largest gatherers and users of information about individuals. This chapter reports the results of the Commission's inquiry into the personal-data record-keeping 'practices of insurance companies and the support organizations that provide them with various services, including record keeping……..

INFORMATION FLOWS FROM INSURANCE INSTITUTIONS

Both life and health and property and liability insurers routinely disclose information about an applicant or insured to the agent, to the extent necessary to service the policy; to reinsurers (when a company underwriting a large policy wants to reduce its exposure to loss); to an insured's physician; to inspection bureaus to facilitate the preparation of an investigative report; and to other types of investigators asked to prepare such reports. Because insurance is often required to buy a house, operate a car, pursue a career, or conduct a business, they may also disclose information about an individual to loan institutions and employers. Further, life and health insurers, as indicated in the preceding sections, also disclose information to the Medical Information Bureau or the Impairment Bureau, and may provide details to another member insurer when requested to do so. Property and liability insurers, for their part, routinely notify the loss indexes of certain claims, and, in some cases, may notify the Insurance Crime Prevention Institute.

Some potential insureds are judged to be so likely to produce adverse claim experience that they cannot obtain insurance in the normal manner. The driver with a poor record poses two problems. The first is meeting his own acute need for financial protection and perhaps his ability to qualify legally as a registered vehicle owner. The second is protecting society from the harm which an unsafe driver is likely to inflict on others. State "assigned-risk" insurance plans were formed to provide coverage to a driver whom companies consider an unacceptable risk and thus can require information about him to be disclosed to the administrators of the plan as well as to the insurance company to which his application is assigned. ……..

THE INTRUSIVENESS OF CERTAIN COLLECTION PRACTICES

Insurance underwriting involves two separate decisions: (1) whether the insurer wants to insure the applicant at all (selection); and if so, (2) at what price and terms (classification). The need to make these two judgments dictates the kind and quality of information an insurance institution collects and maintains about an individual applicant or policyholder. In making these two types of decisions insurers look to physical hazards-medical hazards in life and health underwriting and in property and liability underwriting, the condition of the property, its use, and its surroundings. Underwriters

also look to what is termed moral hazard. Evaluation of moral hazard is made by examining attributes of the applicant which suggest a greater than average likelihood of a loss occurring or the potential for unusual severity of loss-either an absence of a desire on the part of the individual to safeguard himself or his property from loss or a positive willingness to create a loss or to deliberately inflate a claim.

Thus, it is not surprising that the evaluation of moral hazards, particularly in property and liability underwriting, is the area where the greatest number of objections to insurers' information collection practices have been raised. An inquiry may cover drinking habits, drug use, personal and business associates, reputation in the community, credit worthiness, occupational stability, deportment, housekeeping practices, criminal history, and activities that deviate from conventional standards of morality, such as living arrangements and sexual habits and preferences. Because the relevance of many of these particulars can be hard to demonstrate, and because the judgment as to their relevance is often left to the underwriter handling a particular case, their propriety has become subject to question.

From the standpoint of many applicants and insureds, the dichotomy between the individual's privacy interest and the insurer's interest in evaluating risk is probably not as great as it seems at first glance. The low-risk applicant benefits from an underwriting evaluation that results in unusual risks being eliminated or written at a higher premium because that keeps the cost of his insurance down. The Commission was continually reminded that it is in the interest of the applicant to have complete and accurate information on which this judgment can be based so that he can be insured at the proper rate; that the insurer must be able to evaluate the risk it is being asked to assume if premium charges are to bear a reasonable relationship to expected losses and expenses for all insureds within a similar classification. Economic forces may, however, work against a given individual. Because insurers compete against each other for the better risks, they do not have much incentive to look behind some of the criteria they use to sort the good risks from the bad. If their experience suggests, for example, that slovenly housekeepers make poor automobile insurance risks, they tend to be wary of all slovenly housekeepers. The problem, in other words, is not that the category of information lacks predictive value in all instances, but rather that it is applied too broadly. ……..

Genetics and Underwriting

Debate over the use of genetic testing in underwriting develops with that technology. This would seem to be a pretty significant issue, and one which politicians and the insurance industry monitor. Information follows on federal legislation.

GINA Overview

The Genetic Information Nondiscrimination Act of 2008 (GINA) prohibits discrimination by health insurers and employers based on genetic information.[4] Genetic information is considered sensitive for a number of reasons, including that it may be predictive or indicate a predisposition to disease, and that it can affect not only an individual but also

[4] Information from Congressional Research Service Rpt R41314, July 2010

family members. In general, Title XVII of the PHSA, along with parallel provisions in Part 7 of ERISA and Subchapter B of chapter 100 of the IRC, govern the nature and content of health insurance coverage provided primarily in the private sector. Prior to PPACA, many of the provisions dealing with the regulation of private health insurance in these three laws were added by the Health Insurance Portability and Accountability Act (HIPAA), which was designed to improve health care access, portability, and renewability (P.L. 104-191, 110 Stat. 1936 (1996)). PPACA also amends these three laws to create new requirements for private health coverage.

GINA is divided into two main parts: Title I, which prohibits discrimination in health insurance based on genetic information, and Title II, which prohibits discrimination in employment based on genetic information. Title I of GINA amends the Employee Retirement Income Security Act of 1974 (ERISA), the Public Health Services Act (PHSA), and the Internal Revenue Code (IRC), as well as the Social Security Act (SSA), to prohibit group health plans and health insurance issuers providing group and individual health coverage from engaging in genetic discrimination and to strengthen and clarify existing HIPAA nondiscrimination and portability provisions with respect to genetic information and genetic testing.

HIPAA established certain nondiscrimination requirements that are intended to prevent group health plans and health insurance issuers from discriminating against individual participants or beneficiaries based on a "health status-related factor." In particular, HIPAA amended the PHSA, ERISA, and the IRC to prohibit group health plans and health insurance issuers from basing coverage eligibility rules on these health status factors, which include health status (physical or mental), claims experience, receipt of health care, medical history, evidence of insurability, or disability, and genetic information. In addition, group health plans and health insurance issuers may not require that an individual pay a higher premium or contribution than another "similarly situated" participant based on these factors. PPACA retains these requirements and extends them to health insurance issuers in the individual market.

The complexity of the health care financing system required this multifaceted approach in order to ensure protection for all individuals, regardless of their coverage arrangements.

In general, the PHSA, ERISA, and the IRC govern different types of health plans and health insurance coverage. For example, the PHSA covers some self-insured group health plans (non-federal governmental plans), as well as health insurance issuers providing group health coverage and coverage in the individual market (See 42 U.S.C. § 300gg-21). ERISA covers group health plans (including private-sector self-insured plans) and health insurance issuers providing group health coverage, and it does not cover governmental plans, church plans, or insurance in the individual market (*See* 29 U.S.C. § 1003). The IRC covers group health plans, including church plans, but does not cover health insurers.

On October 7, 2009, the Departments of Labor, Health and Human Services, and Treasury issued interim final regulations implementing the provisions in Title I of GINA. These regulations became effective as of December 7, 2009, and specifically for plan years beginning on or after December 7, 2009, for group health plans and health insurance issuers.

Title II of GINA prohibits discrimination in employment based on genetic information and, with certain exceptions, prohibits an employer from requesting, requiring, or purchasing genetic information. The law prohibits the use of genetic information in employment decisions— including hiring, firing, job assignments, and promotions—by employers, unions, employment agencies, and labor management training programs. On March 2, 2009, the Equal Employment Opportunity Commission (EEOC) issued proposed regulations for Title II that generally closely track the statutory language.

GINA Title I and PPACA

GINA prohibits the use of genetic information in determining premiums for individuals or groups or for serving as the basis for conditioning health coverage. PPACA, on the other hand, specifically defines the factors on which insurers may predicate issuance of coverage or determination of premiums. Thus, questions may be raised as to how the two statutes might interact with one another in the specific area of private health insurance market reforms. This section provides an overview of relevant GINA and PPACA provisions concerning coverage eligibility and premium determination to provide context for a statutory analysis outlining the potential interactions between the relevant provisions.

Prohibitions

Broadly, GINA prohibits group health plans and health insurance issuers from engaging in three practices:
(1) using genetic information about an individual to adjust a group plan's premiums, or, in the case of individual plans, to deny coverage, adjust premiums, or impose a preexisting condition exclusion;
(2) requesting, requiring, or purchasing genetic information for underwriting purposes or prior to enrollment; and (3) requiring or requesting genetic testing. Each of these prohibitions is discussed below in more detail.

For purposes of the GINA and PPACA requirements, a "preexisting condition exclusion" means a limitation or exclusion of benefits relating to a condition that was present before the date of enrollment for health coverage, whether or not any medical advice, diagnosis, care, or treatment was recommended or received before such date. 42 U.S.C. § 300gg-3(b)(1)(A). Excluding coverage for preexisting conditions refers to the case in which an applicant for coverage is offered a health insurance policy but that policy does not provide benefits for certain medical conditions.

Premium Determination

GINA prohibits health plans, group and individual health insurance issuers, and issuers of Medicare supplemental policies from adjusting a group or individual's premium or contribution amount based on genetic information about an individual in the group, an individual seeking individual coverage, or an individual's family members.[5]

Collection and Use of Genetic Information Restricted

GINA prohibits health plans, group and individual health insurers and issuers, and

[5] *See, e.g.*, P.L. 110-233, § 101(a). 29 U.S.C. § 1182(b)(3)

issuers of Medicare supplemental policies from requesting, requiring, or purchasing genetic information for the purposes of underwriting or prior to an individual's enrollment or in connection with enrollment.[6]

"Incidental collection" of genetic information—genetic information obtained incidentally to the requesting, requiring, or purchasing of other information concerning any individual—would not be considered a violation of the prohibition on collecting genetic information prior to enrollment if it is not done for underwriting purposes. 'Underwriting purposes,' as defined by GINA, includes
(1) rules for, or determination of, eligibility for benefits;
(2) the computation of premium or contribution amounts;
(3) the application of any preexisting
condition exclusion; and
(4) other activities related to the creation, renewal, or replacement of a contract of health insurance or health benefits.12

GINA also prohibits individual insurers from conditioning eligibility or continuing eligibility on genetic information, and prohibits individual insurers from treating genetic information as a preexisting condition. Issuers of supplemental Medicare policies may not deny or condition the issuance of a policy based on genetic information (and may not impose a preexisting condition exclusion based on genetic information).13

Genetic Testing Requirements Prohibited

GINA prohibits health plans, group and individual health insurance issuers, and issuers of Medicare supplemental policies from requesting or requiring that individuals or their family members undergo a genetic test. This prohibition does not limit the authority of a health care professional to request that an individual undergo genetic testing as part of his or her course of health care. The Act provides for a research exception to this provision, by allowing a group or individual insurance issuer to request, but not require, an individual to undergo genetic testing if specific conditions are met.[7]

PPACA

As noted above, PPACA creates new federal standards applicable to private health insurance coverage. While some of the new federal standards begin to take effect this year, others take effect for plan years beginning on or after January 1, 2014. Among these later reforms, PPACA establishes new rating requirements that allow insurers to vary premiums based only on certain key characteristics. These characteristics are self or family enrollment in a plan or coverage; rating area (as established by a state and reviewed by the Secretary); age (by no more than a 3:1 ratio across age rating bands established by the Secretary, in consultation with the National Association of Insurance Commissioners [NAIC]); and tobacco use (by no more than a 1.5:1
ratio). Thus, health insurance issuers subject to this provision are precluded from charging premiums based on health factors and other additional criteria (e.g., the sex of the covered individual). Further, PPACA prohibits group health plans and health insurance issuers in the individual and group markets from excluding coverage for preexisting health conditions.[8]

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[6] *See, e.g.,* P.L. 110-233, § 101(b). 29 U.S.C. § 1182(d).
[7] See, e.g., P.L. 110-233, § 101(b). 29 U.S.C. § 1182(c)(4).
[8] P.L. 111-148, § 1201 (section 2704 of the PHSA).

PPACA requires individual and group health insurance issuers to offer coverage on a guaranteed issue and guaranteed renewal basis.18 Under the Act, health insurance issuers offering health insurance coverage in the individual or group market in a state must accept every employer and individual in the state that applies for such coverage, subject to certain conditions. Further, PPACA provides that health insurance issuers offering coverage in the individual or group market must renew or continue in force such coverage at the option of the plan sponsor or the individual, subject to exceptions such as nonpayment of premiums, or an act or practice of fraud.

Thus, based on these provisions, a health insurance issuer would be precluded from denying coverage, or denying a renewal of coverage, based on factors such as the individual's health.

Provisions of Title I of GINA and PPACA

In examining provisions of GINA in relation to comparable provisions in Title I of PPACA pertaining to health insurance, there appears to be some overlap in the reach of these Acts. For example, under GINA, a group health plan and a health insurance issuer may not adjust premium or contribution amounts on the basis of genetic information.[9]

Alternatively, under section 2701 of the PHSA, as created by PPACA, certain health insurance issuers may only vary premiums based on certain specified factors (i.e., tobacco use, age, geographic area, and self-only or family enrollment). In evaluating the interaction of these two statutes, one may argue that it is possible to read these statutes together as establishing non-conflicting limitations on insurance premiums. While PPACA creates criteria for premium rates, GINA prohibits premium adjustments based on genetic information. Further, it seems that a health insurance issuer can simultaneously comply with the requirements of PPACA and GINA. While a violation of this provision of GINA may also be a violation of section 2701 of the PHSA, there does not appear to be a barrier to offering penalties for the same conduct under these two statutes. Though one may argue that section 2701 of the PHSA renders GINA, at least in part, ineffective and therefore amends or repeals GINA by implication, given that amendments by implication are disfavored, and without a demonstrated clear intention to override its provisions, a court may be more likely to dismiss this argument.

Further, it should be noted that these provisions of PPACA and GINA are not identical in scope. For example, the limitations on premium amounts as added by PPACA apply only to health insurance issuers in the individual and small group markets, and do not apply (as GINA does), for example, to self-insured group health plans or insurers in the large group market. Further, this section of PPACA applies only to premium rates, whereas GINA applies to premiums as well as contribution amounts. GINA and its accompanying regulations do not define contribution amounts, but it is possible that contribution amounts encompass certain cost-sharing elements of health insurance coverage, including co-payments and deductibles.

In addition, as discussed above, health insurance issuers must accept every individual and employer that applies for coverage and renew or continue such coverage at the option of the plan sponsor or individual. Thus, it seems that the provisions of PPACA

[9] *See, e.g.*, P.L. 110-233. Section 202(b); 29 U.S.C. § 1182(b)(3).

may obviate some of the requirements of GINA. If a health insurance issuer generally cannot use certain underwriting practices or limit enrollment to certain individuals, they may not be inclined to obtain genetic information for these purposes. However, this is not to say that GINA is therefore repealed by PPACA. It is likely that a court may read these statutes in concert with each other: while PPACA removes certain limitations to obtaining health insurance, GINA prohibits obtaining genetic information as part of certain insurance practices. Further, it should also be noted that these provisions of GINA and PPACA are also not identical in scope. For example, the guaranteed availability and renewability requirements of PPACA apply only to health insurance issuers and, accordingly, the effects of this provision of GINA on self-insured group health plans may not be affected by PPACA.

GINA Title II and PPACA

GINA and PPACA both include provisions that relate specifically to employer wellness programs, although neither statute specifically requires the use of wellness programs. In GINA, the relevant provisions are limited to the conditions under which an employer might lawfully collect genetic information pursuant to an employer wellness program. PPACA's provisions are broader, encourage the use of wellness programs, and include specifics about these programs, including the extent of financial incentives that an employer may use to encourage participation in wellness programs. This raises questions about the potential interaction between these two statutes with respect to employer wellness programs. This section provides an overview of relevant employer wellness program provisions in GINA and PPACA to provide context for a statutory analysis of the potential interactions between these provisions. It should also be noted that the provisions of PPACA discussed in this section do not apply to Medicare supplemental benefits. 42 U.S.C. § 300gg-91(c)(4). Thus, these requirements of GINA are likely unaffected by PPACA.

Employer Wellness Programs

Health care costs have risen dramatically in recent years, and employers providing health insurance, as well as other insurance providers, have struggled to find ways to contain costs. This has led to the introduction of incentives to promote healthy behaviors, often referred to as wellness programs. These programs take a myriad of forms, from providing a gym at the workplace to subsidizing the co-pays of certain medications and linking health care benefits or discounts to certain healthy lifestyles. In Arkansas, for example, state employees who exercise more frequently or eat healthier foods can earn up to three extra days off from work each year.[10] These healthy lifestyle programs can include requirements for no tobacco use, as well as requirements for certain cholesterol, blood pressure, and body mass index (BMI) measurements. (Weighing the Wellness Programs: The Legal Implications of Imposing Personal Responsibility Obligations, L. Jesson, 15 Va. J. Soc. Policy and Law 217)

Medical Information

Most, if not all, employer wellness programs collect medical information from participants. Programs may request or require participating employees to answer questions about family history of certain diseases, conditions, or disorders. This information falls under the definition of genetic information under GINA, and therefore its

[10] National Conference of State Legislatures, *State Employee Health Benefits* (Updated February 28, 2010)

acquisition and use by employers is strictly regulated and is protected differently than is employer acquisition of other medical information.[11]

GINA broadly prohibits both the acquisition of genetic information, as well as the use of genetic information by employers in employment decisions; however, it does provide for several exceptions to the prohibition on employer acquisition of this information. Specifically, Title II of GINA allows employers, employment agencies, labor organizations, and training programs to acquire genetic information pursuant to the offering of health or genetic services, including services offered as part of a wellness program.

Chapter 10 RESERVES AND UNDERWRITING

Loss reserving is an activity that is central to the achievement of an insurance company's goals. It involves estimating the magnitude and timing of future claim payments on accidents that have already occurred. These estimates take into account not only claims that are in the process of being settled, but also claims on accidents that have happened but have not yet been reported to the Company. Accurate reserving is important for capital adequacy, investment strategy and pricing. Risk managers and actuaries identify risks to which the insurer is subject.

Decision Trade-offs

For financial managers in any type of business, decisions require a trade-off between risk and return. The aim of a successful manager is to obtain the maximum return possible with no more than an acceptable level of risk. As accepting risks is the business of insurance companies, their financial managers need to be especially alert in making the choice between risk and return. Four major types of risks for insurance companies in their normal operations are excessive claim costs, sales declines, losses in investments and policy loans and cancellations for life insurance companies. Natural disasters can produce excessive claim costs, as can inflation raising claims amounts to unexpected levels or actual losses exceeding estimates. Economic downturns can cause sales declines. Rising interest rates can result in portfolio value loss for bonds and fixed-rate mortgages, and a recession can bring on declines in stock value and defaults on bonds and mortgages. Life insurance companies that offer whole life and endowment policies can face cancellation and policy loan risks, usually during high interest rate periods.

The financial manager's role is to offset such risks with conservative investments designed to compensate for losses and with matching maturity structures. Risk in

[11] Title II of GINA defines genetic information as "with respect to any individual, information about such individual's genetic tests, the genetic tests of family members of such individual, and the manifestation of a disease or disorder in family members of such individual." P.L. 110-233, Section 201(4)(A); 42 U.S.C. §2000ff(4)

insurance operations is uncertainty about the occurrence of an economic loss. Risk in investments concerns the possibility of receiving lower returns than expected from an investment. Investors can only estimate what future returns will be. Actual returns may differ from expectations. The deviation of the actual from the expected return represents the risk associated with this particular investment. There are different uses of the term "risk" in insurance. One concerns the outcomes of events depending on whether they can produce losses or both gains and losses. A pure risk or exposure, such as the possibility of an automobile accident, can only produce a monetary loss, while a speculative risk, like playing the lottery, can produce either a loss or a gain. Only pure risks are considered insurable.

A second way of using "risk" in insurance applies to the variability in distribution of losses for a pure or insurable risk. There are also "objective" and "subjective" risks.

Only risk averse individuals, who wish to avert risks, are willing to buy insurance in order to avoid the uncertainty of future losses. Risk neutral individuals and risk lovers are not good insurance prospects.

In financial theory, individuals are assumed to be risk averse. Because they dislike risk, higher compensation must be offered to persuade them to risk losses. With this assumption, the higher the risk of a security the higher the expected return must be. A risk-free security, such as a Treasury bill, will not have as nigh a return as a risky security. The difference in returns between two such securities is known in financial theory as the risk premium.

The portfolio theory offers a means of reducing risk through diversification. A portfolio is the term applied to a collection of securities. As part of a portfolio, a security is less risky than it would be if held in isolation, because returns of securities in a portfolio are correlated. Most securities are not held in isolation. State law requires insurance companies to hold diversified portfolios of securities. The return and risk relationship of an individual security is analyzed as to how it affects the return and risk of the portfolio. The weighted average return of individual securities in the portfolio gives the expected rate of return of the whole.

If the securities in a portfolio were in perfect negative correlation, all risk would be diversified away, that is, eliminated. In real life, however, most securities are positively correlated. Stock prices or investment returns tend to move up or down together. Thus while combining investments in a portfolio reduces risk, it cannot be expected to eliminate the risk completely. How effective the diversification effort is in the selection of securities with the needed positive or negative correlation to add to the portfolio will determine the amount of risk that will be eliminated.

The total risk of an individual security is judged accordingly in proportion to its diversifiable or nondiversifiable status. The portion of risk which cannot be eliminated by diversification is known as nondiversifiable, market or systematic risk. What can be eliminated is called diversifiable, company-specific or unsystematic risk. Related to the firm whose securities are being considered, unsystematic risk is caused by such factors as new projects, revised marketing programs or personnel problems. Systematic risk is related to the behavior of the market as a whole and is caused by factors such as inflation or interest rate changes. Since unsystematic risk can be diversified away, the market measures only the portion of the total risk of an individual security that is

systematic. Thus the riskiness of a security most important to a prospective investor is not its total risk, measured by standard deviation, but the effect its individual risk will have on the riskiness of the portfolio.

An insurance company handling a number of different lines can be thought of as having a portfolio of insurance investments. The return from underwriting this portfolio would be the weighted average of the underwriting return on each insurance line, and the systematic risk would be the weighted average of the individual lines' systematic risk. Insurance lines, however, are not traded on the market as investment securities are. In practice, indirect methods have to be used for estimating the systematic risk of underwriting various insurance lines.

Two new dimensions of risk are involved in considering the subject from the viewpoint of the individual firm. They are business risk and financial risk. Business risk refers to the riskiness in the specific operations of the firm itself when it is using no debt. Financial risk is the additional risk facing the owners when they decide to use debt. The two kinds of leverage associated with these two types of risk are operating leverage and financial leverage. Operating leverage depends on the effect of sales on the operating income. Financial leverage deals with the effect of debt on the earnings of firm owners. The combination of operating leverage and financial leverage determines the firm's total leverage. The leverage levels depend on the degree of risk the owners of a firm are willing to accept.

Uncertainty in projecting future income, or earnings before interest and taxes (EBIT), produces business risk. This varies among industries and among firms within an industry. Changes in demand for a product, fluctuations in price and cost of operation, and fixed costs as a percentage of total costs can affect EBIT. A firm with high fixed costs has a high degree of operating leverage, meaning that a relatively small variation in sales will cause a large change in the operating income of the firm. Operating leverage is directly related to business risk, which is measured by the variability of EBIT. The degree of operating leverage is the percentage of change in operating income associated with a given percentage of change in sales.

The technology involved in a business operation determines operating leverage. An industry with heavy investment in plant and equipment, such as a utility, has high fixed costs, a high degree of operating leverage, and therefore a high level of business risk. In contrast, a corner newsstand would have relatively low fixed costs, low operating leverage and low levels of business risk. However, even though the level of operating leverage depends to a great extent on the type of business, an individual firm usually still has some control over its operating leverage through appropriate decisions with regard to capital budgeting.

Actual v. Expected

As seen in the previous discussion, risk can take on several definitions. In its most practical trappings, risk can be defined as the chance that actual events turn out to be significantly different than expected and result in a loss of capital. Risks are classified into the following three categories, listed with their associated goals:

- Underwriting -- maintaining an adequate profit on insurance operations
- Financing -- maintaining adequate capital to support growth
- Investing -- maintaining a liquid, diversified investment portfolio that withstands

adverse market trends

Loss reserving is an underwriting risk because significant variations in loss reserve estimates will affect underwriting profit.

Relationship Between Loss Reserving and Pricing Functions

Unlike most industries, insurers do not know their costs until well after a sale has been made. One of the most important functions for an insurer is setting rates or “pricing.” The goal of the pricing function is to properly evaluate future risks the insurer will assume but has not yet written. Estimates of future claim payments are essential for accurately measuring the company’s underwriting profit and for determining whether pricing changes are needed to achieve the target underwriting profit amount. Reserve estimates that are too low can lead to the conclusion that pricing is adequate when it is not, so there is a failure to achieve underwriting target in future periods, and unprofitable growth may be experienced. Reserve estimates that are too high may limit growth opportunities and establish a price umbrella for competitors.

A product-focused business seeks ways to advance the science of ratemaking to achieve accurate cost-based pricing at the lowest level reliable data will support. This allows the insurer to more accurately match rates with expected loss costs by risk classification. The role of the pricing function is to determine rates that are adequate to achieve company profitability goals without being excessive or unfairly discriminatory to customers. Although the pricing function is very different from the loss reserving function, both functions use similar data to do their jobs. Typical information shared by the loss reserving with the pricing organization includes:

- Overall changes in the level of reserves by type of reserve
- History of claim development and selected ultimate losses by accident period
- Changes in selected ultimate loss amounts over time
- Selected severity by historical accident period and resulting trends
- Selected frequency by historical accident period and resulting trends
- Changes in actuarially determined case average reserves by age
- Changes in the level of average adjuster-set case reserve estimates
- Changes in claim closure rates
- Changes in the rate of claims closed without payment (CWP rate)

Judgments made by both the loss reserving and pricing areas consider additional issues. Growth and process changes may cause claims to settle faster or slower than previous experience. Changes made by state insurance departments and changes in the underwriting process may also contribute to unexpected changes in the data. Insurers can use a cost-plus strategy in pricing, beginning with the projected ultimate losses and loss adjustment expenses (LAE). Insurance pricing experts estimate the ultimate losses and LAE for each coverage under review. Their projection methods are similar to those used by the loss reserving area, as described in Section IV.

Trend selections have a significant impact on how much the rates will change. Changes in the average cost of a claim (severity trend) and changes in the proportion of insureds that have a claim (frequency trend) are analyzed and selected. The loss reserving departments meet regularly with the product management, pricing and claims teams to discuss these issues.

About Reserves and Development

The following sections use automobile liability insurance as a reserving example in the following sections. Information on life insurance reserves can be found in a section further along. Reserves are liabilities established on the insurer's balance sheet as of a specific accounting date and are estimates of the unpaid portion of what the Company ultimately expects to pay out on claims. They are estimates of future payments for insured events (claims) that occurred prior to the accounting date, whether or not those claims have been reported. These estimates are reported net of the amounts recoverable from salvage and subrogation. Loss reserves are the company's best estimate of future payments to claimants, and loss adjustment expense (LAE) reserves are the estimated future expense payments to adjust the claims. The types of reserves are reviewed later in this section.

Definition and Stated Goals

The estimate of needed reserves is based on facts and circumstances known at the time of the reserve evaluation. There is inherent uncertainty in the process of establishing loss and LAE reserves, caused in part by changes in the insurance company's mix of business (by state, policy limit, etc.), changes in claims staffing and claims processes, inflation on automobile repair costs and medical costs, changes in state legal and regulatory environments, and judicial decisions regarding lawsuits, expanded theories of liability, and interpretation of insurance policy provisions. The underwriting goal is to ensure that total reserves are adequate to cover all loss costs while sustaining minimal variation from the time reserves are initially established until claims are fully paid and closed. The insurer's actuarial department is accountable for the reserve adequacy and accuracy. The loss reserving area reports to the Corporate Actuary and is part of the corporate finance department. Product management and pricing are generally dispersed over the company's marketing areas, be it automobiles, liability, fire, theft, or other casualty. The loss reserving area works closely with the marketing and claims areas to fully understand the underlying data used. Actuaries use this information to make the reserving decisions independent of the marketing and claims areas. In order to make the most accurate estimation, we analyze our reserves by segment, defined as specific state/product/coverage groupings with reasonably similar loss characteristics. Reserve estimation and segmentation include discussions of the issues considered during analysis.

Calendar Year versus Accident Year

Financial statements report data on a calendar year basis. However, payments and reserve changes may be made on accidents that occurred in prior years, thus not giving an accurate picture of the business that is currently insured. Therefore, it is important to understand the difference between calendar year and accident year losses. (Note that calendar year and accident year concepts may apply to periods other than annual periods, but the term "year" is often used generically).

Calendar Period Losses consist of payments and reserve changes that are recorded on the Company's financial records during the period in question, without regard to the period in which the accident occurred. Calendar period results do not change after the end of the period, even as new claim information develops.

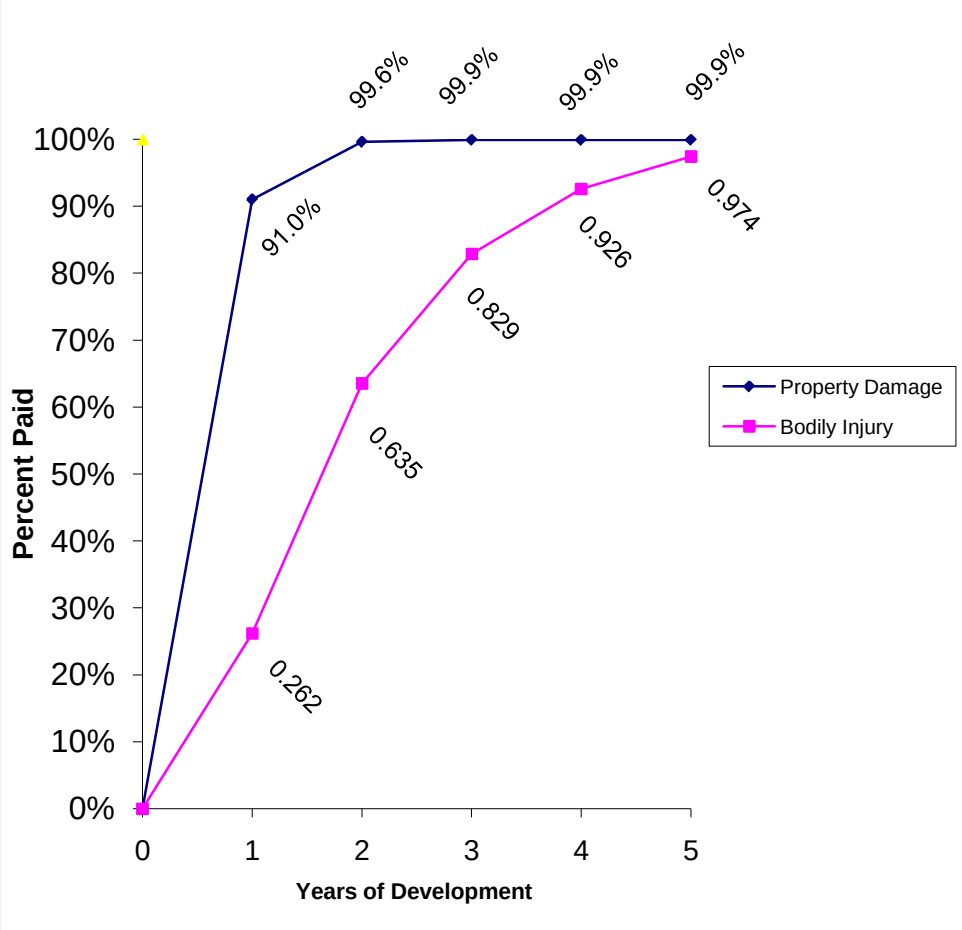
Accident Period Losses consist of payments and reserves that are assigned to the period in which the accident occurred. Accident period results will change over time as the estimates of losses change due to payments and reserve changes for all accidents that occurred during that period. Projection of ultimate losses by accident period is an important part of the reserve analysis.

Paid Development Patterns

Incurred losses consist of payments and reserve changes, so it is important to understand paid development patterns. The longer a claim is expected to stay open (not settled), the more difficult it is to establish an accurate reserve at the time the accident is reported. Since injury claims tend to take longer to settle than property claims, reserve estimates for injury claims are more sensitive to the uncertainties mentioned above, such as changes in mix of business, inflation, and legal, regulatory and judicial issues. As more information is obtained about claims, the reserves are revised accordingly, however, the ultimate amount is not known until the claims are settled and paid.

The following chart compares the time it takes to settle a bodily injury liability claim vs. a property damage liability claim at a typical insurance company.

Chart 10-1



Reserve Development

Ultimate paid losses and loss adjustment expenses may deviate, perhaps substantially, from point-in-time estimates of reserves contained in the insurer's financial statements. Actual claim payments may exceed or may be less than its loss reserves causing the insurer to incur losses in subsequent calendars years that are higher or lower than anticipated. Changes in the estimated ultimate cost of claims are referred to as development. There are several ways for reserve development to occur. They are:

- Claims settle for more or less than the established reserves for those claims
- Adjuster-set reserve estimates on open (reported) claims change
- Average reserves set by the actuaries for open (reported) claims change
- Unreported claims emerge (reported after the accounting date) at a rate greater or less than anticipated. This can be due to either or both of the following:
    - The actual number (frequency) of "late reported" claims differs from the estimate
    - The average amount (severity) of these claims differs from the estimate
- Actuaries' estimates of future emergence patterns on unreported claims change
- Salvage and subrogation recoveries are greater or less than anticipated

The following chart illustrates reserve development over the past ten years for XYZ Insurance. It shows the booked reserves at each year-end, and the re-estimated reserves at each subsequent year-end (down the column for each original accounting date). The last "diagonal" on the chart represents the company reserve evaluation as of December 31, 20x5, of reserves for each respective year-end. The difference between the current evaluation (last diagonal) and the original booked amount of reserves in each column represents cumulative reserve development for that accident year and all prior accident years combined. This measures performance against the goal, stated above, that total reserves are adequate and develop with minimal variation.

Table 10-1 Analysis of Loss and Loss Adjustment Expense (LAE) Development (in thousands of dollars)

For years-	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Yr 10	Yr 11
Loss and LAE reserves, net	1,012.4	1,098.7	1,314.4	1,532.9	1,867.5	1,945.8	2,200.2	2,785.3	3,069.7	3,632.1	4,346.4
Re-estimated reserves as of:											
One year later	869.9	1,042.1	1208.6	1,429.6	1,683.3	1,916.0	2,276.0	2,686.3	3,073.2	3,576.0	
Two years later	837.8	991.7	1,149.5	1,364.5	1,668.5	1,910.6	2,285.4	2,708.3	3,024.2		
Three years later	811.3	961.2	1,118.6	1,432.3	1,673.1	1,917.3	2,277.7	2,671.2			
Four years later	794.6	940.6	1,137.7	1,451.0	1,669.2	1,908.2	2,272.3				
Five years later	782.9	945.5	1,153.3	1,445.1	1,664.7	1,919.0					
Six years later	780.1	952.7	1,150.1	1,442.0	1,674.5						
Seven years later	788.6	952.6	1,146.2	1,445.6							
Eight years later	787.5	949.7	1,147.4								
Nine years later	787.0	950.9									
Ten years later											
Cumulative Development:											
Conservative/ (Deficient)	**224.7**	**147.8**	**167.0**	**87.3**	**193.0**	**26.8**	**(72.1)**	**114.1**	**45.5**	**56.1**	
% of Original Reserves	22.2%	13.5%	12.7%	5.7%	10.3%	1.4%	(3.3)%	4.1%	1.5%	1.5%	

In every year shown other than 2001, the original reserves were conservative, resulting in subsequent favorable development. In other words, claims will cost less than

originally estimated. Reserves that are conservative can lead to over-pricing, which may limit growth opportunities and establish a price umbrella for competitors. Reserves that are deficient can lead to under-pricing, which may contribute to unprofitable growth. It is important to recognize both favorable and unfavorable development as quickly as possible, so that these inefficiencies are corrected. Note that the company recognized its 1999 reserve deficiency and moved to an adequate reserve position within the next year.

Reserves developed favorably during 20x5 (as shown at the bottom of the 20x4 column), with $56.1 million or 1.5% favorable development from accident years prior to 20x3, which represents 0.5% of 20x3 earned premium. Reserving accuracy contributes to the insurer's ability to price product accurately, which supports efforts to maintain rate adequacy.

Many projections are made in loss reserve analyses, which may change as the claims mature. The least mature claims are those that occurred during the most recent accident year. The example shows that the insurer believes the estimated severity for the 20x5 accident year is the projection with the highest likelihood of change. If the company were to change its estimate of severity by 1% for accident year 20x3, the required reserves would change by approximately $41 million.

Note the following points regarding unpredictability in establishing reserve liabilities:

- Reserve development on claims that settle more slowly (e.g., bodily injury liability claims) can be highly variable and extremely difficult to evaluate.
- Regardless of how close the initial accident year estimates are, they will never be 100% accurate, and there will always be development until all claims are settled.
- When significant reserve development in either direction is experienced, knowledge is gained and as a result the company gets better at estimating future reserves.

In addition, loss reserves can only be established for events that have already occurred. Reserves cannot be established for a hurricane, hail, flood or other catastrophic event that may occur later in the year. This can cause substantial fluctuations in monthly results when catastrophic events do occur.

External Reporting of Reserve Changes and Reserve Development

Since reserve changes affect earnings, it is important that insurers disclose the relationship between reserves and income as part of the published earnings data. Here is an example earnings release.

1st Quarter 20x5 ($ in millions)	**Totals**
Net Premium Earned	$3,093.5
Actuarial Adjustments	
Total Calendar Year Adjustment Favorable/(Unfavorable)	$11.5
Reserve Decrease/(Increase)	
Prior accident years	$11.4
Current accident year	0.1
Calendar year actuarial adjustment	$11.5

Prior Accident Years Development	
Favorable/(Unfavorable)	
Actuarial adjustment	$11.4
All other development	(34.3)
Total development	$(22.9)
Calendar year loss/LAE Ratio	63.5
Accident year loss/LAE Ratio	62.8

The table shows that loss and LAE reserves were decreased during the first 3 months of 20x5 by $11.5 million as a result of regularly scheduled actuarial reviews. The total change is reported as “Actuarial Adjustments” in the table. A reserve decrease is shown as a positive value on the earnings report because it increases earnings for the reporting period.

Through the first quarter of 20x5, $11.4 million of the actuarial reserve decrease was for claims in prior accident years, while the remaining $0.1 million decrease was for claims in the current accident year. However, the actuarial reserve decrease of $11.4 million that applies to claims in prior accident years is only part of the total development. The total prior accident years’ development through 1Q, 20x5, was unfavorable by $22.9 million. The insurer now estimates that the reserves as of December 31, 20x4, should have been $22.9 million higher than they were, based on updated information.

As stated earlier in this section, favorable or unfavorable development is due to a combination of claims settling for more or less than the established reserves, changes to adjuster-set reserve estimates and **averages on open claims,** actual and **estimated emergence** of claims that were unreported as of the prior year-end, and salvage and subrogation recoveries greater or less than expected.

The $22.9 million unfavorable prior accident years’ development as of the end of the first quarter of 20x5 is included in the insurer’s calendar year results. As a result, the current calendar year incurred loss and LAE ratio of 63.5% is higher than the current accident year incurred loss and LAE ratio of 62.8%. The difference of 0.7 points reflects the $22.9 million unfavorable development through the end of first quarter, divided by the net earned premium of $3,093.5 million.

It is not unusual that reserves are decreased for prior accident years (per the actuarial reviews) at the same time that total development was unfavorable. This situation can occur due to timing differences in the actuarial review, as well as relative changes and development by reserve component -- loss case, loss IBNR and LAE (which are described in other sections). Reserve changes made as a result of actuarial reviews are intended to keep current reserve liability adequate. Changes are made to the reserves for the reviewed segments based upon current information and projections of expected future development. This is not the same as the aggregate development of prior year-end reserves.

Internal Reporting of Reserve Changes and Reserve Development

To help employees understand the case reserve changes shown on income summaries similar to the one shown above, periodic reports are often issued showing categorical

changes-

- Features that closed
- Features that opened (including reopened features)
- Changes in reserve averages on new features (due to loss reserving)
- Changes in reserve averages on open features (due to loss reserving)
- Inflationary impact on open features (inflation factor applied to average reserves)
- Aging of open features (changing age groupings)
- Changes from adjuster-set to average reserve (reserve amount changes from above threshold to below threshold)
- Changes from average reserve to adjuster-set (reserve amount changes from below threshold to above threshold)
- Changes in adjuster-set reserves (reserve amount changes but stays above threshold)
- Changes due to resegmentation of data

Departments and employees concerned are also provided with updated information regarding the impact of prior accident years' development on their current calendar year results. Case reserve development (on claims reported as of the prior year-end) is tracked separately from IBNR reserve development (on claims unreported as of the prior year-end). This allows retrospective testing of prior assumptions and application of new knowledge in future judgments. It also helps the business managers better understand how their earnings are affected by reserve development.

Types of Reserves

Reserves are considered an operating liability on the balance sheet. Reserves are separated into two categories -- loss and loss adjustment expense (LAE). While each of these two reserve categories is reported in aggregate on the balance sheet, when loss reserves are analyzed, they are broken into two distinct types of reserves -- case and IBNR (Incurred But Not Recorded). It is important that these reserve types and are evaluated in order to get the total reserve balance as accurate as possible. Chart 10-1 illustrates the types of reserves as a percent of total reserve liability for XYZ Insurance. The table shown indicates that 81% of reserve liability (Loss case + Loss IBNR) is set aside to pay claimants while 19% of reserve liability (LAE case + LAE IBNR combined) is established to accommodate costs associated with adjusting those claims.

Chart 10-2

Reserve Distribution		
Loss Case 63%	Total LAE 19%	Loss IBNR 18 %

Loss Reserves

Total indicated loss reserve need is evaluated by sorting and analyzing claims by accident date.

Case Reserves

Loss case reserves represented 63% of total carried reserves for XYZ Insurance at the end of the accounting period. Case reserves are used to pay claims that have already been reported and recorded into XYZ's systems, but have not yet been fully paid. An evaluation is made of indicated case reserve need,

For each open claim, the case reserve that is carried on XYZ's books (the financial reserve) is either an average reserve (determined by the actuaries) or an adjuster-set reserve.

Average Reserves: All open claims estimated to cost the insurer less than a certain dollar threshold (explained below) are assigned an average reserve, regardless of the individual claim characteristics. When a claim is first recorded, there may not be enough known about the claim for an adjuster to determine its severity. The use of average reserves allows claims personnel to concentrate their efforts on adjusting claims rather than merely accounting for them. Therefore, use of average reserves provides more accurate financial reporting in aggregate, and they are not affected by changes in claims processes. The actuaries determine the average reserves, which vary by segment of business. It is not practical to review each segment of business each month, so an inflation factor is applied to average reserves in all other months. The inflation factor is based on projected severity trend from the most recent actuarial analysis for each particular segment of business.

Age of a Claim- The age of a claim is monitored once an average reserve is assigned to a claim. The age of a claim is defined as the length of time from the date of the accident to the current accounting date. The more severe bodily injury claims tend to remain open longer than less severe claims and tend to be more expensive due to litigation, medical treatments, etc. In order to recognize this cost differential, XYZ staff generally increases the average reserves as the claims age. However, the averages for property damage, comprehensive and collision claims are not increased for age, since these claims tend to settle more quickly, and the length of time since the accident is not normally related to their severity.

Threshold: A practical matter is to use the average reserve for claims that have a more predictable level of severity. However, the amount paid for claims above a certain dollar threshold (which varies by coverage) can vary significantly depending on individual claim characteristics. For claims above the threshold dependence is placed on adjuster-set reserve rather than the average reserve.

Adjuster-Set Reserves: When the claims adjuster's estimate of the cost of a claim is above the threshold, the financial reserve includes this estimate rather than the average reserve. The adjuster-set reserves more accurately estimate ultimate liability for claims in excess of the threshold because the adjusters have typically spent a great deal of time on these larger claims and understand their unique characteristics. While only about 2% of the total open claim count for personal auto bodily injury is above the current threshold, these same claims represent about 20% of total personal auto bodily injury case reserve liability.

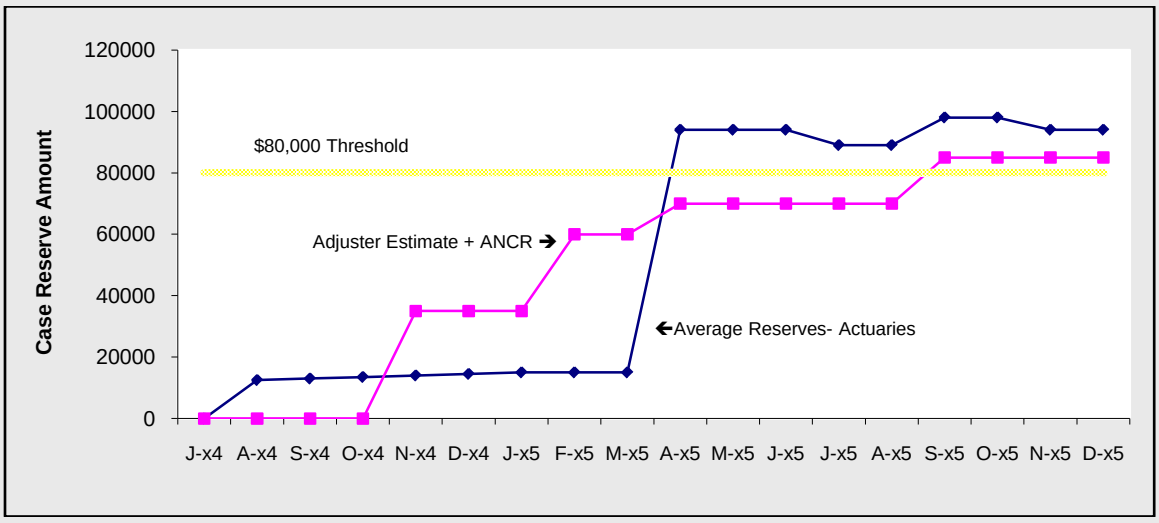
Additional Needed Case Reserves (ANCR): XYZ Insurance carries additional needed case reserves (ANCR) to cover expected future development of claims above the threshold. ANCR is an actuarially determined reserve that is mechanically allocated across segments using ANCR factors. ANCR factors vary by segment and by age, and are applied to bodily injury and uninsured/underinsured motorist bodily injury reserves in excess of the threshold (or slightly below the threshold). These factors decrease as the

claims age since more information is known about claims as they age, plus more claims emerge into this layer over time so the need for this reserve diminishes. The ANCR is determined during the segment review process by analyzing the development of claims over the threshold.

Example:
Chart 10-4 illustrates the life of a hypothetical auto bodily injury claim. When the claim was originally recorded, XYZ assigned the actuarially determined average reserve. As the claim aged from the time it was recorded in August through the end of March, the average reserve changed due to inflation, actuarial reserve reviews and aging. Over this same period of time, the adjuster increased the reserve estimate multiple times as more information was obtained about the claim. Once the adjuster increased the reserve to just below the sample threshold of $80,000, the ANCR factor was applied. The resulting reserve amount exceeded the threshold of $80,000, so the booked reserve changed from an average reserve to an adjuster-set reserve. For XYZ Insurance, the ANCR factor is mechanically applied to this claim in order to allocate the additional needed case reserves. It is not intended to improve the accuracy of individual claims.

Chart 10-3 Case Reserving

XYZ Insurance Case Reserving Over the Life of a Large Auto Bodily Injury Claim Accident Occurred in July, 20x4, Recorded in August, 20x4, Claim Settled January, 20x6 for $90,000



Incurred But Not Recorded (IBNR) Reserves
Reserves are established for claims which will be required to be paid but which have not been reported by the claimants or recorded by the Company as of the accounting date. Incurred But Not Recorded (IBNR) Reserves are estimates of amounts needed to pay for these claims. As shown in the bar chart previously, the loss IBNR reserves for XYZ Insurance were 18% of total carried reserves.

The IBNR reserve need is evaluated by the same segmentation process used for case reserves. This analysis is performed by sorting historical claims according to the time lag between the accident dates and the dates that these claims were recorded by the Company.

Late reported claims are claims whose reporting to the company lag behind those immediately reported. A time lag is an interval of time between two related phenomena; in this case an accident and its reporting. The late reported claims are evaluated to determine the estimated ultimate losses for each accident quarter within each covered period. For example, "Q-1" consists of claims for which the accidents occurred during one quarter but were not recorded until the next quarter. Similarly, "Q-2" consists of all claims for which the accidents occurred during one quarter but they were recorded by the Company two quarters later. “Q-0” claims were recorded in the same quarter they occurred. The following chart shows the approximate percent of recorded features by record quarter lag for auto bodily injury. This chart shows that over 82% of accidents are reported by the claimant and recorded in XYZ’s system by the end of the quarter in which they occurred. However, that means approximately 18% of the features are not yet recorded and an estimate of IBNR reserves must be made for these claims.

Late Reported Claims		
Reporting Quarter	**Incremental %**	**Total**
Q-0	82.1%	82.1%
Q-1	13.7%	95.8%
Q’s 2-3	2.3%	98.1%
Q’s 4-6	1.2%	99.3%
Q’s 7-9	0.4%	99.7%
Q’s ≥10	0.3%	100%

IBNR reserves are recorded at the end of each month (by segment) by applying IBNR factors to each 3-month-ending period of earned premium for the past 3 to 4 years. The largest IBNR factors are in the most recent accident periods. This is because the greatest IBNR reserve need is for these accident periods. As premium volume increases, the IBNR reserves also increase, which allow these reserves to keep up with growth and inflation.

Loss Adjustment Expense (LAE) Reserves

In addition to loss payments (which indemnify the claimants), insurers incur expenses in the process of settling claims. Therefore, XYZ Insurance needs to estimate a reserve liability for loss adjustment expenses (LAE). At the end of the accounting year, the LAE reserves were 19% of total carried loss and LAE reserves. There are two major categories of loss adjustment expenses – Defense and Cost Containment (DCC) and Adjusting & Other (A&O). LAE reserves are periodically reviewed by segment. The evaluations of DCC expense reserves and A&O expense reserves are performed independently of each other.

Defense and Cost Containment (DCC) includes all defense and litigation-related expenses, as well as medical cost containment expenses. This category is comparable to, but not exactly the same as, what was called Allocated Loss Adjustment Expenses (ALAE) prior to the definition change by the National Association of Insurance Commissioners (NAIC) in 1998. The total indicated DCC expense reserve needs are evaluated by sorting and analyzing these expenses by accident date. XYZ Insurance further segments the category by splitting the DCC expenses into the “Attorney and Legal” and “Medical and Other” components.

Most of the same mechanisms that are used to allocate loss case reserves are also used to allocate DCC case reserves. Average reserves are determined by age within each segment. The older-aged claims (based on the time between accident date and

accounting date) carry higher averages, and those averages are increased each month based upon a selected inflation factor. When the adjuster estimates the DCC reserve to be over a certain threshold, the adjuster-set DCC reserve is carried rather than the actuarially determined average reserve. Carried DCC IBNR reserves are calculated as a percentage of the carried loss IBNR reserves for each respective segment.

Adjusting & Other (A&O) includes all claims adjusting expenses, whether internal or external. This includes fees, salaries and overhead expenses relative to those involved in a claim adjusting function, as well as other related expenses incurred in determination of coverage. This category is comparable to, but not exactly the same as, what was called Unallocated Loss Adjustment Expenses (ULAE) prior to the definition change by the NAIC in 1998. For A&O expense reserves, total indicated reserve needs are allocated by comparing adjusting and other expense payments with loss payments over the past several calendar quarters. The selected ratios are applied to the loss reserves and then modified to derive indicated A&O expense reserves. Carried A&O case reserves are calculated by applying the selected average A&O expense reserve to each open claim. Carried A&O IBNR reserves are calculated by applying the selected IBNR factor to the carried loss IBNR reserves.

Salvage and Subrogation

Generally Accepted Accounting Principles (GAAP) require that loss reserves be stated net of anticipated salvage and subrogation recoveries. Statutory Accounting Principles (SAP) allow reduction of reserves by the amounts that the company expects to recover, but do not require it. However, the company does not report loss reserves net of anticipated salvage and subrogation recoveries. Salvage and subrogation are similar because they reduce the net claim amount, but they are different types of transactions.
Salvage: The insurer assumes the title to a vehicle when it has been declared a total loss. The vehicle is then sold to a salvage dealer, and these proceeds are referred to as salvage. Salvage is most relevant for collision claims.
Subrogation: When a policyholder is involved in an accident in which the other party is at fault or partially at fault, he/she may submit the claim to us. When that claim is paid, the company obtains the policyholder's right to recover damages from the at-fault party (usually the at-fault party's insurance company). Subrogation is most relevant for collision (damage to vehicles) and personal injury protection claims (injuries in no-fault states).

As salvage or subrogation is collected from third parties, it reduces the net paid and incurred loss amount for that claim. When claim data is evaluated to determine needed reserves, the evaluation is completed net of these recoveries. Estimated ultimate loss amounts are shown as net of anticipated salvage and subrogation. Since recoveries generally occur after claims have been closed and then reopened, negative IBNR reserves are carried on an insurer's books for anticipated salvage and subrogation.

Segmentation and Loss Reserves Estimates

For loss reserve review purposes, insurers often divide their book of business into smaller groups of data known as segments. A segment is defined by a specific state/product/coverage grouping with reasonably similar loss characteristics. During a segment review XYZ Insurance will generally estimate the ultimate loss amounts for the

past seven accident years using six different projections. The insurer may use additional techniques if there are wide variations between the six projections or if underlying process changes make those projections less reliable. Payments made on claims that occurred during the same period are subtracted in order to estimate the required reserve balance (unpaid losses) for the segment. In this way the reserve level for that segment can be changed or modified based upon this review. In a dynamic environment, with rapidly changing operational parameters, the application of judgment by experienced staff will be a key component of any reserve analysis. This is especially true in a situation where changes in mix of business (e.g., by policy limit and geographic area) can be significant.

Segmentation of Reserves for Analysis

Segments are identified to allow the review of reserve needs at the most detailed level supported by data on hand. This is especially true in a market in which changes in mix of business, such as by policy limit and geographic area, can be significant. It provides the ability to identify and measure variances and trends in severity and frequency. They also allow process changes to be identified and reflected in a review. Each segment is required to have enough data to deliver reliable (credible) results. The objective is to achieve adequacy in the reserve levels with minimal variation for each segment. This enhances the accuracy of financial reporting, supports the income statements of business units, and allows company management to make better business decisions.

Projections of Ultimate Losses

XYZ Insurance, like many other insurers, reviews the results of six different projections in order to determine if a reserve change is required. Three of the six projections use paid data and the other three projections use incurred data (payments plus reserves). There are strengths and weaknesses to each of the projections.

The three paid projections -- amount paid, average paid and Bornhuetter-Ferguson paid -- all use paid loss data. The paid projections estimate growth and development of claims in an accident period by looking at the paid development of earlier accident periods. This assumes that past paid loss development is a predictor of future paid loss development. The primary strength of using paid data is that it removes the potential for distortions that may be created by including estimated data. The drawback is that it is more difficult to accurately project ultimate losses in the most recent periods under review. For example, with longer-tailed lines of insurance such as bodily injury, the early development periods are more volatile because a large proportion of the payments are made later. Accurate paid projections also depend heavily on consistent claims closure or settlement practices. If the closure rate changes, the paid projections could be misleading. In addition, shifts in mix of business (e.g., changes by policy limit) are not as readily identified in paid development as in incurred development.

The three incurred projections -- amount incurred, average incurred and Bornhuetter-Ferguson incurred -- use paid losses plus case loss reserves in each accident period. They assume that historical incurred loss development will be predictive of future incurred loss development. The primary strength of using incurred data is that it can make use of reserve estimates for open claims. These estimates are based on the judgment of claims adjusters in addition to the prior actuarial reviews. This is especially critical when estimating ultimate losses for longer-tailed claims such as bodily injury.

The drawback of using incurred data for projection is that it depends heavily on consistent adjuster reserve estimates. The incurred projections could be distorted if the average adjuster reserve adequacy fluctuates over time.

It is necessary to identify changes in closure rates and average adjuster reserve levels through segmentation and also through discussions with insurance company management. Adjustments are made for these changes in the projections of losses.

The six standard projections used to estimate ultimate losses are:

1. **Amount Paid-** In this method, the total loss dollars paid by accident period and age of development are organized into a triangular format and projected to estimated ultimate amounts. Selections of future loss development are based largely on the historical development of prior periods.
2. **Average Paid**- A standard projection in which the paid severity (average amount paid per feature) are organized by accident period and age of development into a triangular format and the severities are projected to estimated ultimate levels. Ultimate loss amounts are then calculated as the ultimate severities multiplied by the estimated ultimate number of features to be paid.
3. **Bornhuetter-Ferguson Paid-** This uses the paid loss development pattern to determine the percent unpaid. The percent unpaid is applied to the expected ultimate loss amount to arrive at the expected unpaid amount, which is added to actual losses paid-to-date.
4. **Amount Incurred-** This projection organizes the total loss dollars incurred by accident period and age of development into a triangular format and projects them to estimated ultimate amounts. Future loss development is based largely on the historical development of prior periods.
5. **Average Incurred-** This is a method in which the incurred severity (average amount incurred per feature) is organized by accident period and age of development into a triangular format and the severities are projected in order to estimated ultimate levels. Ultimate loss amounts are then calculated as the ultimate severities multiplied by the estimated ultimate number of features to be paid.
6. **Bornhuetter-Ferguson Incurred-** This is a method which uses the incurred loss development pattern to determine the percent not yet recorded. The percent unrecorded is applied to the expected ultimate losses to arrive at the expected unrecorded amount, which is added to actual losses incurred-to-date.

Chapter 11 RESERVES, TAXATION AND THE IRS

Attention is now turned to life insurance reserving. Policy reserves are the major liability item of life insurers. The characteristics, purpose, and kinds of life insurance policy reserves are discussed in this section

Characteristics of Life Insurance Reserve

Under a level-premium plan of life insurance, the premiums paid during the early years of the contract are higher than is necessary to pay death claims, while those paid during the later years are insufficient to pay death claims. The excess or redundant premiums collected during the early years of the contract must be accounted for and held for future payment to beneficiaries. The surplus premiums paid during the early years result in the creation of a policy reserve.

Accounting for Life Reserves

Incorporate this with file 'Life Insurance Reserve Computation Rules'

Policy reserves are a liability item on the company's balance sheet. They represent an obligation by the insurer to pay future policy benefits to policyholders or their beneficiaries. Reserves must be offset by assets equal to the reserve amount. The policy reserves held by the insurer plus future premiums and future interest earnings will enable the insurer to pay all future policy benefits. This will hold true if the actual experience conforms to the actuarial assumptions used in calculating the reserve. Policy reserves are often called **legal reserves**, since state insurance laws specify the minimum basis for calculating them.

The policy reserve has two fundamental purposes-

1. The reserve is a formal recognition of the company's obligation to pay future benefits. The policy reserve plus future premiums and interest earnings must be sufficient to pay all future policy benefits.
2. It is a statutorily mandated test of the company's solvency. The insurer must hold assets equal to its legal reserves and other liabilities.

This is the legal test of the insurer's ability to meet its present and future obligations to its policyholders. Policy reserves should not, therefore, be viewed as a fund. Rather, they are a liability item that must be offset by "funds" or assets. About 80 percent of the insurer's assets are needed to offset its reserve liabilities.

Policy Reserve Defined

At the inception of the policy, the net single premium is also equal to the present value of future net premiums. The net single premium can be convened into a series of annual installment payments without changing this relationship. Once the first installment premium payment is made, this is no longer true. The present value of future benefits and the present value of future net premiums are no longer equal to each other. Policy reserve can be defined as the difference between the present value of future benefits and the present value of future net premiums. The net single premium is equal to the present value of future benefits. The present value of future benefits will increase over time, since the date of death is drawing closer, while the present value of future net

premiums will decline, since fewer premiums will be paid. Thus, the difference between the two is the policy reserve.

Chart 11-1

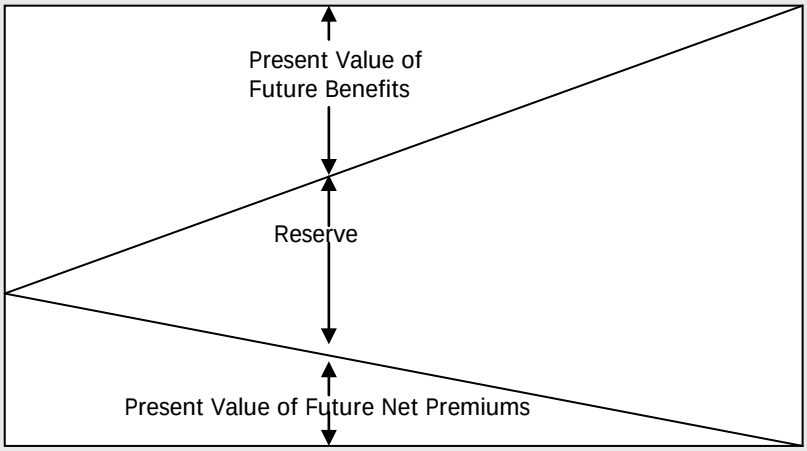


Chart 11-1 illustrates this difference. It shows the prospective reserve for an ordinary life policy issued at age 47. At the inception of the policy, the net single premium is equal to the present value of future benefits and the present value of future net premiums. The present value of future benefits increases over time, while the present value of future net premiums declines, and the reserve is the difference between them. For instance, if the policy matures at age 100, at that time, the reserve is equal to the policy face amount. If the insured is still alive at that time, the face amount of insurance is paid to the policyholder. The equation for net annual level premium-

$$NALP = \frac{NSP}{PVLAD \text{ of } \$1}$$

Utilizes this relationship and is illustrated in Chapter 6.

Types of Reserves

Retrospective Reserve- The reserve can be viewed either retrospectively or prospectively. If it is referring to the past experience, the reserve is known as a retrospective reserve. The retrospective reserve represents the net premiums collected by the insurer for a particular block of policies, plus interest earnings at an assumed rate, less the amounts paid out as death claims. The retrospective reserve is the excess of the net premiums accumulated at interest over the death claims paid out.
Prospective Reserve- The reserve can also be viewed prospectively when looked at from the future. The prospective reserve is the difference between the present value of future benefits and the present value of future net premiums. The retrospective and prospective methods are the mathematical equivalent of each other. Both methods will produce the same level of reserves at the end of any given year if the same set of actuarial assumptions is used.

Reserve Timing

Reserves can also be classified based on the time of valuation. At the time the reserves are valued, they can be classified in one of the following three ways.
Terminal Reserve- A terminal reserve is the reserve at the end of any given policy

year. It is used by companies to determine cash surrender values and also to determine the net amount at risk for purposes of determining dividends.
Initial Reserve- This is the reserve at the beginning of any policy year. It is equal to the preceding terminal reserve plus the net level annual premium for the current year. The initial reserve is also used by insurers to determine dividends.
Mean Reserve- The mean reserve is the average of the terminal and initial reserves. It is used to indicate the insurer's reserve liabilities on its annual statement.

Reserves and Taxation

The following are ordinary connotations of the term "reserve" as used for most accounting and income tax purposes:
Valuation Reserves —Such reserves indicate that the value of an associated asset is overstated by the amount of that reserve. A common example of this type of reserve is a depreciation reserve or account. This is a contra asset account, commonly called accumulated depreciation.
Reserves for Contingent Liabilities —These measure the value of potential future losses. An example of this type of reserve might be a reserve set up for an anticipated loss that could arise from a pending lawsuit against the corporation.
Surplus Reserves —Such reserves are really allocations of surplus earmarked for special purposes. An example would be appropriated retained earnings.
Fluctuation Reserves —Such reserves are hybrid reserves between valuation reserves and surplus reserves. Such reserves are used to cushion fluctuations in the market value of marketable securities valued on the balance sheet.

Annual Statement

The Annual Statement is a report made by a company at the close of the fiscal year, stating the company’s receipts and disbursements, assets and liabilities. Such statements usually include an account of the progress made by the company during the year. This can also be the same as the annual report as of the end of the calendar year made by an insurer to the state insurance department. The report shows assets and liabilities, receipts and disburesements, and other informaiton.

Space considerations mean that only referenced sections of the Annual Statement can be illustrated. To view Annual Statements, the Texas Department of Insurance points out at its website-

Annual statement information that companies file with the National Association of Insurance Commissioners (NAIC) can now be accessed online.

Go to: http://www.naic.org/cis/

A program capable of reading PDF documents is needed to view the annual statements. To find the financial information, enter the company name and the state in which it is licensed - Aetna Insurance Company, licensed in Texas, for example. If possible, check the policy for the company's correct name because coverage may be issued by a subsidiary with a different name.
When entering the company, use only those words unique to that name - Aetna, for example, not Aetna Insurance Company. The lookup function does not work when using

the company's full name because the NAIC uses abbreviations for more common words such as INS for insurance and CO for company.
Company information is provided "AS IS" with "no guarantee of the truth, accuracy or completeness of the information," according to the NAIC. For more information about the financial statements, please contact the NAIC's Insurance Data Products at 816-783-8700.
NOTE: The NAIC Company Search page provides a variety of information. Financial data includes key annual statement data, a key financial profile and basic data about business written, assets and liabilities. Closed Consumer Complaint data also may be available, as well as a chart noting whether that company is writing business in all fifty-five states and territories.

Insurers develop balance sheets for both GAAP and SAP reports. On an insurer's Annual Statement the term 'balance sheet' does not appear on any of the exhibits or schedules. The Annual Statement's equivalent of a balance sheet is shown as two pages; the Assets page and the Liabilities, Surplus and Other Funds page. The Annual Statement of a life insurance company will often reflect each of the above ordinary types of reserves, even though the formal accounts of the company may not include any of them. A valuation reserve such as a depreciation reserve will be reflected in the net value of the asset on the balance sheet. However, for income tax purposes, life insurance companies are not permitted to report their bad debts on a reserve basis; rather, the specific write-off method is required. A contingent liability reserve will generally be reported under either the line for Miscellaneous Liabilities or the line for Aggregate Write-in Liabilities shown on page 3 of the Annual Statement.

A. A surplus reserve should always be reported under the applicable line for Special Surplus Funds on page 3 of the Annual Statement. Certain surplus reserves may be required by the statutory authorities.

B. Life insurance companies had been required to maintain a fluctuation reserve which, prior to 1991, was known as the "Mandatory Securities Valuation Reserve" (MSVR). However, beginning with the 1991 Convention Blank, the MSVR was replaced by two new required fluctuation reserves designated as the "Asset Valuation Reserve" (AVR) and the "Interest Maintenance Reserve" (IMR). These fluctuation reserve items are not different in substance from surplus reserves, except that they are required by the statutory authorities and are preprinted on the Convention Blank as liability items (rather than as special surplus items) on lines 21.4 and 11.4, respectively, of page 3 of the Annual Statement.

2. A special circumstance arises for mutual life insurance companies because of the elimination of the MSVR in 1991. Under IRC section 809, applicable only to mutual life insurance companies, the MSVR was included in the determination of the company's average equity base. However, it is expected that, for 1991 and later years, the AVR and IMR will replace the MSVR in the equity base determination (see "Differential Earnings Amount," later).

3. Insurance companies are different from ordinary commercial corporations in that they must set aside and maintain significant levels of special reserves which they need to pay insurance policy benefits. A life insurance company sells insurance and annuity contracts which, in consideration of premiums received from its policyholders, obligate the company to pay benefits if certain future contingent events occur. These contingent events (risks) include death, survival, disability, accidental injury and sickness. The financial impact of an insurance contract cannot be known exactly until the insured risks occur or the contract otherwise terminates. This may occur soon after a policy is issued, or many years later. For an extremely large number of issued

and outstanding insurance policies, however, these risks can be predicted with reasonable accuracy based on the laws of statistical averages. In order to systematically build assets to support their future obligations, a life insurance company must set aside a considerable portion of the premiums it collects, but which it has not yet used to pay benefits, as a reserve fund. These reserve funds, combined with premiums it will receive in the future plus investment earnings, will accumulate over the years and be available to pay benefit obligations.

4. Therefore, in addition to the common types of reserves that ordinary corporations maintain, life insurance companies must also establish and maintain in their annual statements the following special types of reserve liabilities:
   A. Actuarial reserves (policy reserves).
   B. Unearned premium reserves.
   C. Unpaid loss reserves.
   D. Other liabilities or reserves under insurance or annuity contracts, which may or may not accumulate at interest.
5. The nature, significance, and tax relevance and treatment of these special types of reserves will be described in the following sections.

Actuarial Reserves and Statutory Accounting

Under state insurance laws, a life insurance company is licensed to sell only contracts of life insurance, annuities, accident and health insurance, and special types of group annuity contracts used to provide employee retirement benefits. A contract may be issued to insure only one person (individual contract) or to insure many persons (group contract). A life insurance company, therefore, generally maintains actuarial reserves for many different types of policy forms and benefits. For most life insurance companies, reserves for life insurance policies represent the bulk of their actuarial reserves. Whole life insurance policies provide protection for the entire life of the insured. Term life insurance policies provide protection only for a limited period of time. If a term life policy also pays a lump sum amount to the insured if he lives to the end of the term, the policy is called an endowment life policy. The discussion in this section will be focused on traditional individual whole life insurance policies. Reserves for term life and endowment life policies, as well as for annuities and accident and health insurance, are based on the same fundamental principles.

Individual Life Insurance Policy Reserves

Under an individual life insurance policy, a policyholder selects one of several premium payment options. Under a "single premium" policy, the policyholder purchases the policy with a single premium payment at the issue date. It is more common, however, to pay premiums on an annual or more frequent periodic basis, and this discussion will assume that method of payment. The reserve for a fully paid-up premium policy, such as a single premium life insurance policy or a policy for which no further premiums are due, is simply a special case of the reserve for a premium-paying policy.

Traditional Whole Life Policy Reserves

Under a traditional whole life insurance policy, the insured death benefit (the face amount) remains level and guaranteed for the lifetime of the insured person, provided the required premiums are timely paid. The premiums are usually paid in equal annual

installments over the lifetime of the insured, or over a fixed number of years. Since the risk of death increases as the insured person ages, the annual cost of insurance under the policy also increases. The annual cost of insurance is called the annual mortality cost, which is simply the expected amount of claim for that year ("amount at risk") based on the insured's assumed death rate for that year. The assumed annual death rates are obtained from standard actuarial tables, called mortality tables, which the insurance company uses to calculate its premiums and reserves. In order for the insurance company to charge a level annual premium for the policy, when the annual mortality cost is increasing, the premium charge during the early policy years must be greater than the mortality costs for those years. Accordingly, the premium charge for later policy years will be less than the mortality costs for those years. This gives rise to the concept of a policy reserve during the life of the policy because, if the insurance company is to have sufficient funds to pay the claim costs in the later years when those costs exceed the level premiums, it must accumulate the excess level premiums in earlier years. It is this "accumulation" with interest, of past excess level premiums that generates the reserve at each policy duration. Thus, the function served by the reserve is to balance the premiums with the rising mortality costs.

The policy reserves, however, are not actually computed by accumulating, with interest, the actual premiums charged the policyholder and then subtracting the actual past mortality costs. The actual premium charged is called the "gross" premium, which is the total amount that the insurance company determines is required to cover estimated mortality costs, policy expenses and a margin for profit and contingencies.

Naturally, the gross premiums must also be competitive with gross premiums charged by other insurance companies if the policy is to be marketable. As discussed in elsewhere in the book (Chapter 6), the setting of gross premium scales for insurance policies, called "pricing," involves many different actuarial assumptions and complex calculations. Life insurance reserves, on the other hand, are calculated by using an entirely different set of premiums calculated on a "net" basis. These net premiums, sometimes called "valuation net premiums" or "tabular net premiums," are calculated using only mortality and interest assumptions, so as to cover just the mortality costs with no allowance for expenses or profits. The premiums are calculated independently of the gross premiums charged and are used strictly to determine the actuarial reserves. As a margin of safety, the reserve valuation laws of the various states require that life insurance policy reserves for the company's annual statement must be determined on a net premium basis. The gross premiums charged generally exceed the reserve valuation net premiums. This excess has often been called the "loading." However, since the gross and the valuation net premiums are calculated independently of each other, there are instances where that relationship changes and the valuation net premiums exceed the gross premiums. When that is the case, the state regulatory authorities require that adjustments be made to the reserves otherwise determined so that the annual statement reserves for those policies will not be deficient. Such additional reserves are known as "deficiency reserves."

Calculating Policy Reserves

The first step in the reserve process is to calculate the valuation net premiums using an assumed mortality table and an assumed interest rate, which are the key actuarial assumptions, Under one of several different valuation methods of calculating reserves,

such as the Net Level Premium Method, these net premiums are determined as a level amount over the entire premium paying period. Other reserve valuation methods may be used which affect the pattern in which the reserves accumulate, and these will be mentioned later in this section. Once this net premium is determined, policy reserves may be calculated for any policy duration by utilizing either of the two reserve balancing equations—the Retrospective Equation or the Prospective Equation:

A. Under the retrospective equation, the reserve equals the accumulated value of all past net premiums less the accumulated value of all past assumed mortality costs.

B. Under the prospective equation, the reserve equals the present value of all future assumed mortality costs less the present value of all future net premiums.

C. Under both equations, the reserve calculation uses the same mortality and interest assumptions used to derive the net premiums. Both produce identical reserve amounts; the choice depending only on which equation better facilitates the calculation. The accumulations and present values under these reserve equations are determined using actuarial mathematics, i.e., these summations reflect both mortality and interest discounting. To better understand the reserve process, apply the prospective equation at the inception of the policy, i.e., at the policy duration zero, when the reserve must be zero. By substituting zero for the reserve, the prospective equation reduces to the following equation to the present value of all future net premiums, equals the present value of all future assumed mortality costs.

D. This equation now expresses the fundamental relationship between the net premiums and the expected mortality costs over the entire life of the policy, and becomes the formula initially used to calculate the net premiums.

Reserve Valuation Methods

After selecting a mortality basis and an assumed interest rate and calculating the net premiums, select one of several acceptable reserve valuation methods. The valuation method defines the pattern or rate at which the reserves accumulate over the life of the policy whichever valuation method is selected. The reserve will become the same at some designated future duration eventually. The reserve must accumulate ultimately to the face amount of the policy when the insured attains the terminal age of the mortality table (i.e., the age by which all insured individuals are assumed to have died). The Net Level Premium Method is one of these valuation methods.

Net Level Premium (NLP) Method- This method has been the traditional method of calculating life insurance reserves used by life insurance companies. Other valuation methods, called "modified reserve methods," have been developed to compensate for an inherent weakness in the NLP method. Under the NLP method, the net valuation premiums remain level over the entire premium paying period. Consequently, the loading included in the gross premium charge, intended to cover policy expenses, is clearly the same amount for each policy year.

Expenses Higher at First

A life insurance company’s actual policy expenses, however, are not level and, moreover, are significantly higher in the first policy year than in renewal years. The very high first year expenses are a natural consequence of the process of selling and issuing an individual life insurance policy. Agents’ sales commissions are much higher in the first year than in renewal years. There are also first-year non-recurring expenses to underwrite and approve the insurance application, for medical examinations, and for

clerical functions to set up initial records and to issue the policy. The total first year expenses generally exceed the expense loading charged in the first year gross premium, and may even exceed the entire first year gross premium. Under the NLP method, the first year net premium is entirely used to cover the assumed mortality costs of that year and establish the first year policy reserve. As a result, the remaining expense loading from the gross premium becomes insufficient to cover first year actual expenses. The life insurance company is then forced to make up this insufficiency by borrowing from its surplus funds, in effect a "surplus loan," which then gets returned to surplus in renewal years as the gross premium expense loading becomes more than sufficient to cover actual renewal year expenses. Normally, this first year new business surplus strain creates little difficulty for well established companies with ample surplus funds. For small or newly established companies with limited surplus, however, this need to draw on surplus to finance new business ("surplus strain") could impair their financial position and their ability to generate new business.

First Year Modification

This situation is alleviated by deploying a modified valuation method that recognizes the decreasing incidence of expenses and provides a greater amount of expense loading in the first policy year than in renewal years. This modification accumulates reserves from a first year net premium that is smaller than the net premiums for renewal years. Under modified reserve methods, the sequence of net level premiums under the NLP method is replaced by a reduced first year net premium followed by a series of increased net level premiums for renewal years over a specified number of years. At the end of the specified modification period, the original net level premiums are restored and full NLP reserves are carried. This modified net premium sequence must be equivalent in actuarial value to the sequence of original unmodified net level premiums, so that the modified reserves will grade up to the NLP reserves. Modified reserve methods produce lower reserves than the NLP method in the first policy year and throughout the entire modification or grading period. The intent of these reserve methods is to reduce the first year net level premium, thereby increasing the amount of the first year expense loading. In effect, the modified method borrows some portion of the first year net premium under the NLP method to partially offset the expense loading insufficiency, and progressively returns the borrowed portion to the reserves in renewal years.

FPT and Other

Several of the recognized modified valuation methods that have been in general use for calculating life insurance reserves are the Full Preliminary Term (FPT) Method; Commissioners’ Reserve Valuation (CRVM) Method; Illinois Method; New Jersey Method; and the Canadian Method. The FPT method provides the greatest additional first year expense allowance because its first year net premium covers only the assumed mortality cost of the first year. As a result, the reserve at the end of the first policy year is zero. Thereafter, the modified renewal net premium is exactly the same amount as the net premium under the NLP method for an exactly similar policy issued one year later at an age one year older, and the reserves accumulate accordingly. The FPT method is not appropriate for all types of policies because of excessive additional first year expense allowances for high premium policies, and its application is restricted by state regulatory authorities. The other methods listed in this subheading above are called "modified preliminary term methods," because they all modify in some way the additional first year expense allowance under the FPT method. They differ from each

other in the amount of the additional expense allowance and the length of the modification period. The CRVM is significant because it has been adopted by the state regulatory authorities, pursuant to the NAIC Standard Valuation Law, as the prescribed valuation method in defining minimum annual statement reserves for individual life insurance policies. It is also significant for income tax purposes, because it is the prescribed method for calculating life insurance tax reserves for life insurance policies under IRC section 807(d). This is discussed further in the section titled ‘Reserves for Tax Deduction Purposes (IRC section 807)’

Statutory Reserve Valuation Law

In order to closely regulate life insurance companies in certain areas of their activities, state insurance laws and regulations impose minimum reserve requirements on all reserves reported in company annual statements. The states’ concern is with insurance company solvency and the protection of policyholder interests. Policy reserves for all life insurance policies must, in the aggregate, equal or exceed a total reserve level which is determined by using certain prescribed assumptions for mortality and interest and a prescribed valuation method. These prescribed standards for determining minimum statutory reserves generally follow the provisions of the NAIC Standard Valuation Law and its interpretations. CRVM is the value method model as incorporated in state statutes prescribed by both the NAIC and Federal tax law for defining individual life insurance reserves. The prescribed standards for mortality and interest will vary by line of business and policy issue date. Statutory standards are established to produce conservative minimum reserve levels in keeping with the states’ responsibility to regulate financial solvency. It should be noted, however, that companies are permitted to use any actuarial basis for determining statutory reserves, provided the approach results in aggregate reserves that equal or exceed the minimum reserves produced by the statutory standards.

Mortality Tables and Reserves

The life insurance industry conducts ongoing studies of mortality experience under all types of life insurance policies and annuities. For purposes of calculating premiums and reserves, the industry has constructed and published a number of standard mortality tables. A mortality table tabulates annual death rates for each integral age from age 0 (or the earliest significant age) to an arbitrary terminal age, usually around age 100. For ordinary life insurance policy reserves, the mortality tables are, or have been, in common use the Commissioners 1980 Standard Ordinary Tables (1980 CSO); Commissioners 1958 Standard Ordinary Table (1958 CSO); Commissioners 1941 Standard Ordinary Table (1941 CSO); American Experience (AE) Table; and the American Men (AM) Table.

For simplicity’s sake, this discussion will restrict itself to the 1980 mortality table. The transition to the 2001 Table is discussed in Chapter 6 of this book.

The 1980 CSO Tables, consisting of separate tables for males and females, are the prescribed mortality standards operative on all life insurance companies for policies issued on or after an "operative date" elected by each company, but where such date could not be later than January 1, 1989. The majority of states had adopted it as their prescribed standard by 1982. Prior to the adoption of the 1980 CSO Tables as the

prescribed standard, the 1958 CSO Table had been the prevailing state standard for policies issued in 1960 and later years, although it did not become mandatory in all states until 1966. The 1958 CSO Table is a male mortality table; female mortality rates are assumed by using an age setback to the male death rates, initially recommended to be 3–years. Reserves are typically lower under the 1980 CSO than under the 1958 CSO. Prior to the adoption of the 1958 CSO Table, the 1941 CSO table had been the prevailing standard for policies issued in 1948 and later years. Since mortality experience under other types of life insurance contracts and under annuity contracts differs substantially from mortality experience under ordinary life insurance contracts, special mortality tables have been constructed and are used for setting reserves under those other type contracts. A few of those more recent mortality tables are as the Commissioners' 1961 Standard Industrial Table (Industrial Life Insurance); Commissioners' 1960 Standard Group Mortality Table (Group Life Insurance); 1971 Individual Annuity Mortality Table (Individual Annuity); 1971 Group Annuity Mortality Table (Group Annuities); 1983 Table "a" (Individual Annuities); and the 1983 Group Annuity Mortality Table (Group Annuities).

By 1985, the majority of states had adopted, as their prescribed mortality standards for minimum reserves for annuity contracts, the 1983 Table "a" (for Individual Annuities) and the 1983 Group Annuity Mortality Table (for Group Annuities).

Interest Rates and Reserve Valuation

The Standard Valuation Law prescribes the maximum interest rates that may be used in calculating the minimum reserve standards for life insurance and annuity contracts. Again, this is to ensure that such policy reserves will be conservatively valued. Since life insurance and annuity contracts generally reflect long-term commitments, the effect of the assumed interest rates on their reserves can be highly dramatic. Generally, the higher the interest rate assumption, the lower the required reserve. For many years prior to the 1980 Amendments to the Standard Valuation Law, these prescribed maximum interest rates were at very low levels. For example, for all life insurance contracts, the maximum rate ranged from 3.5 to 4.5 percent. In general, annuities were subject to the same low interest rates up until the latter part of the 1970s, when some relief was given by elevating the maximum rate to 7.5 percent for group annuities and for individual single premium immediate annuities. These low interest rate standards were very unrealistic throughout the 1970s when actual interest rates were escalating to all time high levels with double digit rates commonplace. This excessive conservatism was more fully addressed with the 1980 Amendments by introducing a "dynamic" interest rate approach for establishing the maximum statutory rates. The Standard Valuation Law was changed to define a formula method of determining the statutory interest rate, rather that specifying the actual rate, with such formulas reflecting actual yields on seasoned corporate bonds. Thus, commencing with policies issued after 1982, the maximum interest rates will vary by different product features for life insurance and annuities, and these interest rates are subject to change each calendar year. For example, for life insurance policies, the maximum statutory interest rate varies by the number of years of a policy's guarantee duration, such that for any calendar year of issue there may be three entirely different valuation interest rates that are applicable. By the dynamic formula approach the maximum interest rates are automatically promulgated each year eliminating the need for each state to amend their insurance laws.

Timing Functions

One further component in the calculation of a policy reserve is the timing function. This refers to the assumptions as to the time when claims and premiums will be payable. Normally, it is the practice of life insurance companies to pay death benefits as soon as possible after the death occurs. Premiums, on the other hand, are usually payable at scheduled dates depending on the payment mode elected by the policyholder. However, to facilitate the computation of premiums and reserves, it is customary to make convenient assumptions as to the timing of claims and premiums.

Curtate Function- Under this function, death benefits are assumed to be paid at the end of the policy year of death, and all annual premiums, irrespective of the actual payment mode, are assumed paid at the beginning of the policy year. This claim payment assumption is convenient because annual death rates, as measured to the end of a year, are exactly calculated from mortality tables.

Continuous Function- Under this function, death benefits are assumed to be paid at the moment of death, and all annual premiums, irrespective of the actual payment mode, are assumed to be paid uniformly throughout the policy year. This idealized premium payment assumption is particularly convenient when the actual premium mode is quite frequent, such as the weekly mode (under industrial life insurance) or the monthly mode (when paid through a payroll deduction plan).

Special actuarial adjustments are made to convert curtate functions to continuous functions. Reserves calculated by continuous functions will be higher than when calculated by curtate functions. The reason for this is that, since, on average death benefits are assumed to be paid one-half year sooner and premiums are assumed to be received one-half year later, additional reserves are needed to compensate for the loss of interest on the death benefit and for the loss of one-half year's premium during the policy year of death.

Semi-continuous Functions- Under these functions, either death benefits are assumed to be paid at the moment of death, or annual premiums are assumed to be paid uniformly throughout the policy year.

Annual Statement Reserve Valuation

For any individual policy, actuarial reserves may be exactly calculated for each policy year as of the end of the policy year. A reserve value at the end of a policy year is called a "terminal" reserve. A reserve value at the beginning of a policy year is called an "initial" reserve, which is simply the sum of the terminal reserve for the preceding policy year plus the net premium for the current policy year. For statutory reporting purposes, however, reserves must be established as of the annual statement's year-end date, December 31, in total for all policies in force as of that date. Life insurance companies issue policies throughout the calendar year and, as a result, policy anniversaries fall on many different dates. For most of the policies in force, the December 31 valuation date will not coincide with a policy year-end date, but will fall at an interim point during the current policy year. When a policy's reserve must be valued as of a date that falls between its policy year-ends, the valuation is called an "interim" valuation. Life insurance companies often use approximation methods, which deploy terminal reserves, to conveniently estimate interim reserves for annual statement purposes where large numbers of policies are involved. Three such approximation methods in common use are the Mean Reserve, Mid-Terminal Reserve and Interpolated Reserve methods.

Mean Reserves- This method assumes that a large group of policies have issue dates evenly distributed throughout the calendar year (so that the "average" anniversary date is July 1, and an average one-half a policy year has elapsed by December 31), and premiums are paid annually at the beginning of the policy year (so that by December 31 it is assumed that every policy has paid a full year's premium for the current policy year). The mean reserve (or, mid-year reserve) for each policy equals the average (mean) of the current policy year's initial and terminal reserves. For a large group of policies which do pay annual premiums, the mean method is a reasonable estimate of their total reserves at December 31; and for those annual premium policies which do have a July 1 anniversary date, the mean reserve is the theoretically correct reserve at December 31. For many of the policies in the group that pay their policy year premiums in installments, the mean reserve method's annual premium assumption overstates the premiums actually paid by December 31 for the current policy year and, thereby, overstates their December 31 reserves. When premiums are paid on a "fractional" or "modal" basis (e.g., semi-annually, quarterly, or monthly) some portion of the total fractional premiums for the current policy year will fall due after December 31, and that portion is called "deferred fractional premiums." To effectively offset the mean method's inherent reserve overstatement for policies with deferred fractional premiums, statutory reporting requires certain accounting procedures. The total of all gross deferred premiums is compiled and explicitly reported in the annual statement and included in premium income for the current calendar year, gross loading charges are deducted from that income as expenses, and a special asset account is established on the balance sheet as of December 31 equal to the related net valuation deferred premiums (as if the net deferred premiums were amounts receivable). Net valuation deferred premiums are used because the sole purpose of this asset account is to offset the excess net premiums included in the mean reserves. If any deferred fractional premiums are actually paid prior to December 31, they are not included in the deferred premium asset and, under statutory reporting conventions, they are not treated as advance premiums. Moreover, any gross premiums that were due prior to December 31, but uncollected as of that date, are accounted for in the same manner as deferred premiums, with the net portion included in the same asset account. This asset account is identified in the balance sheet as "life insurance premiums deferred and uncollected." Life insurance companies may determine their net deferred and uncollected premiums either on a seriatim basis (i.e., a policy-by-policy listing of gross and net premiums), or on an aggregate basis (i.e., applying group ratios of net to gross deferred and uncollected premiums from historical experience). In the special case where terminal reserves are based on continuous functions, whereby premiums are assumed to be paid uniformly throughout the policy year, the mean reserve is simply the average of the terminal reserves for the preceding and current policy years. There are no adjustments required to these reserves, since the annual premium payment assumption under the mean method does not apply. There are no deferred fractional premiums to adjust for. The mean reserve method is commonly used for computing annual statement reserves for ordinary life insurance policies.

Mid-Terminal Reserves- Under this method, it is also assumed that the policies in the group have an average anniversary date of July 1 and that one-half a policy year has elapsed by December 31. However, no direct assumption is made as to the amount of current policy year premiums paid in by December 31. Therefore, the mid-terminal reserve is determined as the average (mean) of the terminal reserves for the preceding and current policy years, plus an unearned premium reserve equal to the portion of the

modal premium due prior to December 31 which covers the period from December 31 to the next modal premium date. The unearned premium reserve may be based on net valuation premiums or gross premiums, and it may be calculated by using either the exact unearned period or a simplified approximation such as one-half the modal period. Under this method, no deferred fractional premium asset is established. If the policy pays annual premiums, then the mid-terminal method is identical to the mean method when one-half year's net premium is used as the unearned premium reserve. The mid-terminal reserve method is generally used for computing annual statement reserves for industrial life insurance and for individual health insurance policies.

Interpolated Reserves- This method introduces a refinement to the mid-terminal reserve method. There is no assumption as to an average anniversary date of July 1. Instead, the actual anniversary date of each policy is taken into account by applying a linear interpolation between the terminal reserves for the preceding and current policy years based on the exact fraction of a year elapsed from the actual anniversary date to December 31. The unearned premium reserve, which is added to the interpolated terminal reserves, is then determined as the exact unearned portion of the net modal premium. As in the case of the mid-terminal method, no deferred fractional premium asset is established, since no direct assumption is made as to the amount of current policy year premiums paid in by December 31. If the policy has an anniversary date of July 1 and it pays annual premiums, then the interpolated reserve method is identical to both the mean and mid-terminal methods. Some companies use the interpolated reserve method for computing annual statement reserves for ordinary life insurance policies as a refinement and to eliminate the need to establish a deferred fractional premium asset.

Description of Life Insurance Reserves for Tax Purposes

The current Federal income tax law relating to life insurance companies was enacted under the Tax Reform Act of 1984 (TRA 1984). Subsequent legislation under the Tax Reform Act of 1986 (TRA 1986), the Omnibus Budget Reconciliation Act of 1987 (OBRA 1987) and later Acts amended the original TRA 1984 in many important respects, including significant aspects of reserves. Notwithstanding these revisions, the reserve sections of the Code remain structurally the same as they were originally enacted under TRA 1984.

Reserves play an extremely important role in the Federal taxation of life insurance companies. Under IRC section 816(a), reserves are the key element in determining whether a company that qualifies to be taxed as an insurance company would further qualify to be taxed specifically as a life insurance company. This key element is known as the "reserve ratio test" which requires that "life insurance reserves," as defined by IRC section 816(b), and certain other reserves, must comprise more than half of the life insurance company's total insurance reserves. Moreover, under IRC section 807, the net increase or decrease during the tax year of these life insurance reserves and certain other reserves directly affect the life insurance company's taxable income for the year. IRC section 807 also prescribes specific rules as to how life insurance reserves and certain other reserves must be computed for the purpose of determining the increase or decrease in reserves for the year. These computational rules are intended to establish uniform Federal tax standards applicable to all life insurance companies in computing certain reserves for tax deduction purposes, and to limit the level of these reserve deductions. These computational rules were the major change to life insurance

company reserves adopted by TRA 1984. The Code definition of life insurance reserves, as those reserves affect the reserve ratio test, and the types of contracts for which life insurance reserves are held, will be discussed in this section. Since the reserves that are used for the reserve ratio test are those held by the company for state regulatory purposes in the annual statement (statutory reserves), the location of those reserves in the Annual Statement can be identified. Some examples of those types of reserves which generally qualify as life insurance reserves, and those that generally do not, will be given. The specific rules for reserve computations prescribed by IRC section 807 are discussed further along in the section titled 'Reserves for Tax Deduction Purposes (IRC section 807)'

Federal Tax Laws Affecting Reserves

To better appreciate the foundation of the current tax law treatment of life insurance company reserves, it is important to begin with a brief summary of the history of key Federal tax laws affecting reserves:

Revenue Act of 1913- Under this Act, life insurance companies were taxed on their total income from all sources. Since reserves were required to meet policy obligations, the assets held in support of those policy reserves were not available to the company for its free use. Under this Act, therefore, companies were permitted to deduct from income the amount required by state law to be added during the year to its reserve funds.

Revenue Act of 1921- Starting with this Act, life insurance companies were taxed only on their investment income. Consequently, it was no longer necessary to allow a deduction for the full increase in reserves. Companies were permitted, however, to deduct from their investment income the amount of interest required to be added to their reserves each year. Under the Act, the deduction was fixed at an interest rate of four percent applied to the company's mean reserves. This interest rate was then changed periodically thereafter by various tax laws enacted through 1957.

Life Insurance Company Income Tax Act of 1959- This Act significantly changed the taxation of life insurance companies effective with the 1958 tax year. Once again companies were taxed on their total income from all sources, but now they were taxed by a complicated three phase structure for determining taxable income. When determining taxable investment income, they were allowed to deduct the policyholder's share of investment income calculated by specific statutory rules. When determining the gain from operations, the net increase in reserves for the year was deductible, but such deduction was reduced to avoid a double reserve deduction. An important provision in the law also allowed companies which valued their life insurance reserves under a preliminary term method to adjust those reserves for tax purposes to higher net level premium reserves, either by exact recalculation or by statutory approximation rules. This adjustment provision was intended to create tax parity for small or newly formed companies, who typically used preliminary term reserves, with large, well established companies who at that time typically used net level premium reserves. As time passed, most companies adopted preliminary term reserves for their statutory reserves, and then capitalized on the tax adjustment rule to obtain significantly increased tax reserve deductions.

TRA 1984- For various reasons, including simplification of the life insurance company tax law, the 1959 Act was repealed and a new tax structure was enacted under TRA 1984, effective with the 1984 tax year. Companies continued to be taxed on their total income, but under a single phase structure consistent with the way other commercial corporations are taxed. Although life insurance companies now receive a deduction for

the full annual increase in their reserves, under this Act the law prescribes specific rules, including actuarial methods and factors, for computing life insurance reserves and certain other reserves strictly for the purpose of determining a life insurance company's taxable income. The definition of life insurance reserves still applies exactly as it did under the 1959 Act, but under TRA 1984 it has practical application only with respect to the reserve ratio test to determine if the insurance company may be taxed as a life company, and to identify that subset of total deductible reserves that must be calculated by the tax law rules.

Tax Code Definition of Life Insurance Reserves

As discussed previously, actuarial reserves are conservative estimates of the amount of funds that must be set aside which, together with future tabular net premiums, will be exactly sufficient to pay the future policy claims as they fall due. The reserve amounts are equal to the present value of future expected benefits less the present value of future tabular net premiums, where the present values are discounted for interest and mortality and, as appropriate, also for morbidity (for example, for disability type benefits).

The Internal Revenue Code contains a precise definition of actuarial reserves for life insurance and annuity benefits and, with certain restrictions, for accident and health (A & H) benefits, and designates these reserves as "life insurance reserves." As defined in IRC section 816(b), life insurance reserves are reserve amounts which satisfy all the following conditions:

- Must be computed or estimated on the basis of recognized mortality and/or morbidity tables, and assumed rates of interest.
- Must be set aside to mature or liquidate, by payment or reinsurance, future unaccrued claims.

Such future claims must arise under life insurance contracts or annuity contracts, or noncancelable A & H insurance contracts (including life insurance or annuity contracts which are combined with noncancelable A & H insurance). Such future claims must involve at the time the particular reserves are computed, life, accident, or health contingencies (i.e., mortality or morbidity risks). The reserves must be required by law (i.e., by state law, rules or regulations), except for two situations specifically cited in IRC section 816(b).

Ratio Basis

It is important to note that it is the statutory life insurance reserves actually held in the company's annual statement that are the tax basis reserves to be used for purposes of the reserve ratio test, provided the reserves meet the conditions above, except that statutory reserves must be reduced by the following adjustments mandated by the Code and the Regulations: Any deficiency reserves included in the statutory life insurance reserves, even though required by state law, must be excluded for tax purposes. This is the case even though IRC section 816(b) has a general requirement that the reserves must be required by state law (See IRC section 816(h)). Any reserve amount set aside and held at interest to satisfy obligations under any contracts which do not provide permanent guarantees with regard to life, accident or health contingencies must be excluded from life insurance reserves, and from all other insurance reserves that otherwise would be included as total reserves in the denominator of the reserve ratio. IRC section 816(f). In other words, such reserves are not taken into account for

qualification purposes. Policy loan amounts outstanding on contracts for which life insurance reserves are held must be excluded from life insurance reserves, but only for qualification purposes. IRC section 816(d). If any deferred and uncollected premiums, or any due and unpaid premiums, are not required to be included in the company's gross income for the tax year, then an appropriate reduction must be made to the life insurance reserves for such premiums. This reduction is to be made only if the life insurance reserves were calculated on the assumption that premiums are paid annually in advance, or that all premiums due prior to the statement date have been paid. (Treas. Reg. 1.801–4(f) and IRC section 811(c))
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Qualification Standards for a Life Insurance Company

An insurance company must first meet the doing business standard required under the Internal Revenue Code to quality for taxation as a life insurance company, rather than as a property and casualty insurance company. The doing business standard requires that the company must be engaged in the business of issuing life insurance and annuity contracts, or noncancelable accident and health (A & H) insurance contracts (IRC section 816(a)). Under state insurance laws, property and casualty insurance companies cannot issue life insurance or annuity contracts but, like life insurance companies, they can issue A & H insurance. Although A & H insurance originated within the casualty insurance industry, it was the life insurance industry's intensive involvement beginning during the 1930s, particularly in group medical care insurance, that accelerated the development of A & H insurance. Today, the marketing of A & H insurance is dominated by life insurance companies. Accident and health insurance is frequently provided under group master contracts issued to employers, associations and other qualified groups to insure employees, members and families. Most group insurance (whether life or A & H) is issued on a term basis, usually one-year term. This permits the insurance company to adjust premium rates at the end of the term or to cancel the master contract. An insurance company that sells life insurance or annuities clearly meets the doing business standard, but a problem can arise if it issues only A & H insurance. In this situation, tax qualification as a life insurance company would be denied unless some of the company's A & H business was issued under noncancelable or guaranteed renewable contracts. Such contracts are typically issued only on an individual basis. If the insurance company meets the life business standard, the next standard that the company's insurance business must meet is the critical measurement standard, the reserve ratio test under IRC section 816(a).

Reserve Ratio Test

The reserve ratio test is a measure of an insurance company's actual activity in the business of issuing long-term commitments under life insurance and annuity contracts, and analogous long-term commitments under noncancelable and guaranteed renewable A & H insurance contracts. If the reserves that support an insurance company's long-term commitments equal more than half of its total insurance reserves for all of its commitments, the reserve ratio test is satisfied. The reserves used in the numerator of the ratio, intended to measure reserves supporting the company's long-term commitments, are the life insurance reserves, plus the unearned premium reserves and unpaid loss reserves held under noncancelable life, accident or health policies that were not otherwise included in the life insurance reserves. The reserves used in the denominator of the ratio are the total insurance reserves that are required by

state law, but adjusted as required by the tax law. Virtually all major life insurance companies could have little problem meeting this test. However, the reserve ratio test can present a problem for small or new life insurance companies, or for insurance companies, chartered as life insurance companies, who have a limited business such as A & H or credit insurance, and who seek to be taxed favorably as a life insurance company.

Accident and Health (A & H) Insurance

A & H insurance provides protection against economic losses that result from accidents or sickness. This insurance may be provided under A & H insurance contracts alone or in combination with life insurance contracts. A & H insurance contracts may be issued under individual or group contract forms, or under special credit insurance contracts used only to insure debtors for loan obligations. A great variety of benefits exist under many forms of A & H contracts, but all such insurance may be classified into three general categories:

Disability Income Insurance (Loss of Time)- This insurance provides periodic payments for a specified period of time while the insured has a qualified disability. It is intended to partially replace income lost by the insured because of inability to work at a gainful occupation. Income benefits vary in amount and duration of payment. Contracts may provide short-term benefits (up to two years), or long-term benefits payable for at least five years, but frequently payable for life or until age 65.

Accidental Death and Dismemberment Insurance (AD&D)- This insurance provides lump-sum payment if the insured dies from a covered accident. It also provides a lump-sum payment if the insured suffers loss of body members (hand, foot or eye) from a covered accident, where the payment amount is a fraction of the death benefit. This insurance may also pay multiples of the accidental death benefit if death is a result of commercial travel.

Medical Care Insurance (Hospital & Medical)- This insurance provides reimbursement of the insured's actual covered expenses for treatment of injuries and sickness. Various contracts may cover hospital, surgical and/or physician's expenses and may also cover diagnostic and nursing services, medicines, medical appliances and dental care. Comprehensive coverage is provided under major medical contracts. Medical care insurance is generally issued to permit coverage of the insured's family members. This insurance is primarily written under master group insurance contracts issued to employers and other qualified groups to insure employees, members and their families. Group insurance contracts are typically issued on a one-year term basis, subject to renewal at the insurance company's discretion.

Accident and Health (A & H) Reserves

Because of the myriad of benefit provisions under A & H insurance and the inherent difficulty in measuring the related morbidity experience, state legal requirements for A & H reserves have generally been less explicit than for life insurance and annuity reserves. The Standard Valuation Law has for many years defined very specific minimum reserve standards for life insurance and annuity policies. For A & H, most state laws simply provided that companies establish sound values for their reserves that would not be less than reserves under standards contained in insurance department regulations. Some states, not having adopted specific reserve standards, based their requirements on reserve item instructions in the statutory annual statement. Specific

reserve standards for individual A & H contracts, adopted by the NAIC in 1964, served over the years as the basis for reserve regulations issued by many state insurance departments. Insurance department regulations could be revised to change reserve requirements, such as the adoption of new morbidity tables, without having to amend state law. In 1989, the NAIC adopted a new model regulation setting forth new minimum A & H reserve standards for both individual and group contracts (other than credit), superseding all previous NAIC A & H reserve standards. The tax law is also generally less explicit about its A & H reserve requirements than it is for life insurance and annuity reserves.

Active Life Reserves

Active life reserves are established to recognize that the premiums charged are intended to cover future liabilities as well as current claim costs. All contracts must have an Unearned Premium Reserve (UPR). The UPR represents that portion of the gross premiums paid or due for the current premium period allocated to the period from December 31 to the next premium due date. Methods of computing the UPR can vary considerably between and within companies. It may be computed on the exact pro rata method using actual premium due dates, or by the "monthly pro rata method" used by many companies. Under the monthly method, all premiums in force at December 31 are tabulated into premium mode/due month cells, and then an appropriate factor is applied to each cell to derive the UPR on the assumption that all policies are issued in the middle of the month. For group policies paying monthly premiums due on the first day of a month, the method will usually be modified so that no UPR is established for that block of policies. Under credit insurance contracts, premiums may either be paid as single premiums based on the initial insured debt, or as monthly premiums based on the monthly outstanding balance of the insured debt. Most credit insurance is now issued under group contracts. For single premium insurance, the single premium is generally included in the debt and the creditor (policyholder) remits the single premium to the insurance company for each newly insured debtor on a monthly basis. Under the monthly premium method, the group creditor remits the premiums due monthly. The UPR for single premium credit insurance may be calculated by the actuarial method, pro rata method or the "rule of 78" method. The actuarial method calculates the reserve as the single premium for the outstanding debt balance and its remaining term, and results in the most accurate reserve. The UPR for monthly premium group credit insurance is usually calculated by the same methods used for other group A & H contracts. The UPR for all types of A & H contracts do not qualify as tax basis life insurance reserves. Moreover, the UPR for cancelable A & H contracts may not be included as qualifying UPR in the numerator of the reserve ratio test. However, for noncancelable or guaranteed renewable A & H contracts, the UPR may be included in the numerator of the reserve ratio test and help to qualify the company as a life insurance company.

Additional Active Life Reserves

For noncancelable or guaranteed renewable A & H contracts only, active life reserves greater than the UPR must be established. This is because the insurance company has a longer commitment to continue coverage under a level premium contract where claim costs increase with the insured’s age. The effect of level premiums, increasing claim costs and the contract’s renewal guarantee create reserve requirements analogous to those under noncancelable level premium life insurance. The instructions for Exhibit 9 state that an additional policy reserve, above the UPR, must be held for any policy

which provides a guarantee of renewability, and that the NAIC standards adopted in 1964 are acceptable bases for these reserves. The usual practice is to compute the UPR as described above and then determine the additional reserve on the mid-terminal basis. The NAIC minimum reserve standards specify the two-year preliminary term valuation method to calculate this reserve. With respect to long-term care insurance, a one-year preliminary term method may be used. Exhibit 9 has a separate line item for each of the UPR and this additional reserve, but the instructions permit the inclusion of the UPR on the same line for the additional reserve. Current NAIC guidance requires that the UPR not be less than the present value of future claims attributable to the unexpired policy term. This deficiency reserve does not quality as tax-basis reserve. This additional reserve will usually meet the conditions to be treated as tax basis life insurance reserves, provided the A & H contract meets the definition of a noncancelable or guaranteed renewable contract contained in the Regulations. Moreover, the definition itself requires that the A & H contract has such an additional active life reserve. Therefore, as qualified life insurance reserves, they can be included as such in the numerator of the reserve ratio test, together with the contract's UPR and its includible unpaid loss reserves.

Claim Reserves

Sometimes called "disabled life reserves," these reserves are established when a claim actually occurs and that claim involves continuing loss after the statement date. A claim occurs when the insured becomes disabled, injured or sick giving rise to a benefit obligation under the contract. In the "Glossary of Actuarial Terms" published by the Actuarial Standards Board, A & H claim reserves are defined as "the actuarial present value as of a valuation date of future, contingent claim payments for claims incurred as of the valuation date, whether or not the claims have been reported." The discussion of claim reserves and their distinction from claim liabilities is appropriate in a life insurance context, but not in a property and casualty context. Claim reserves are to be contrasted with "claim liabilities," which refer to the insurance company's obligation for accrued claim payments due on or prior to the statement date, whether or not the claims have been reported, which remain to be paid.

Claim reserves for noncancelable or guaranteed renewable A & H contracts which do not meet the conditions for life insurance reserves, however, may be included as unpaid loss reserves in the numerator of the reserve ratio test. However, claim reserves for an A & H contract which is neither noncancelable nor guaranteed renewable cannot qualify as life insurance reserves, nor can they qualify as unpaid loss reserves that may be included in the numerator of the reserve ratio test. The Internal Revenue Service position is that all claim reserves for cancelable A & H contracts must be shown in the denominator (Harco Holdings, 977 F 2d 1027 (7th Cir.) 1992). Hence, in the case of a disability income claim reserve in respect to a disabled life as of the statement date, where the reserve is actuarially computed in compliance with IRC section 816(b), the claim reserve will not qualify as a life insurance reserve if the A & H contract is cancelable, but will qualify if the A & H contract is noncancelable.

Life Insurance and Annuity Reserves

Exhibit 8 is the annual statement exhibit for reporting policy reserves for life insurance and annuity contracts. Exhibit 8 reserves are reported under four major lines of

business or types of contracts — industrial life insurance; ordinary (individual) life insurance or annuities; credit life insurance (for loans not in excess of 120 months); and group life insurance or annuities.

Life insurance policy reserves are reported in Part A and annuity policy reserves are reported in Part B of the Exhibit. Life insurance and annuity reserves which qualify as tax basis life insurance reserves under IRC section 816(b) should be included in Exhibit 8. However, not all Exhibit 8 reserves will qualify as life insurance reserves, because they may not meet all the conditions of IRC section 816(b).

Gross reserves for policies issued directly by the company, as well as business reinsured with the company (reinsurance assumed), are reported on a separate line within each Part of Exhibit 8 for each distinct actuarial basis used to calculate reserves. An actuarial basis is defined by the specific mortality table, interest rate(s) and the valuation method used to calculate the reserves. The insurance company is required to specify the details of the actuarial basis for each reserve line. The total reserves for all business which is reinsured with another company (reinsurance ceded) are reported as a single line item for each major line of business under each Part and are so identified as reinsurance ceded reserves. The reinsurance ceded reserves are then subtracted from the total gross reserves to obtain the net reserves.

EXHIBIT 8- CLAIMS FOR LIFE AND ACCIDENT AND HEALTH CONTRACTS

Part 1- Liability End of Current Year

	1	2	Ordinary			6	Group		Accident and Health		
			3	4	5		7	8	9	10	11
	Total	Industrial Life	Life Insurance	Individual Annuities	Supplementary Contracts	Credit Life (Group & Individual)	Life Insurance (c)	Annuities	Group	Credit (Group & Individ)	Other
1. Settlement during the year											
1.1 Direct	0	0	0	0	0	0	0	0	0	0	0
1.2 Reinsurance assumed	0	0	0	0	0	0	0	0	0	0	0
1.3 Reinsurance ceeded	0	0	0	0	0	0	0	0	0	0	0
1.4 Net	0	0	0	0	0	0	0	0	0	0	0
2. In course of Settlement											
2.1 Resisted											
2.11 Direct	151,999	0	151,999	0	0	0	0	0	0	0	0
2.12 Reinsurance assumed	0	0	0	0	0	0	0	0	0	0	0
2.13 Reinsurance ceeded	126,871	0	126,871	0	0	0	0	0	0	0	0
2.14 Net	25,128	0	25,128	0	0	0	0	0	0	0	0
2.2 Other											
2.21 Direct	46,772,196	0	16,268,679	6,650,892	0	0	8,261,303	188,845	6,540,550	0	8,861,927
2.22 Reinsurance assumed	275,212	0	275,212	0	0	0	0	0	0	0	0
2.23 Reinsurance ceeded	7,526,175	0	2,119,366	3,344,178	0	0	1,403,411	167,008	428,308	0	63,904
2.24 Net	39,521,233	0	14,424,525	3,306,715	0	0	6,857,892	21,836	6,112,242		8798,023
3. Incurred but unreported											
3.1 Direct	43,861,545	0	7565,004	4,643,233	0	0	4,254,257	293,922	13,414,719	0	13,690,410
3.2 Reinsurance assumed	109,753	0	109,753	0	0	0	0	0	0	0	0
3.3 Reinsurance ceeded	5,973,201	0	1,032,682	2,436,987	0	0	495,272	200,053	1,664,966	0	143,241
3.4 Net	37,998,097	0	6,642,075	2,206,246	0	0	3,758,985	93,869	11,749,753	0	13,547.169
4. Totals											
4.1 Direct	90,785,740	0	23,985,682	11,294,125	0	0	12,515,560	482,767	19,955,269	0	22,552,337
4.2 Reinsurance assumed	384,965	0	384,965	0	0	0	0	0	0	0	0
4.3 Reinsurance ceeded	13,626,247	0	3,278,919	5,781,164	0	0	1,898,683	367,061	2,093,274	0	207,145
4.4 Net	77,544,458	0	21,091,728	5,512,961	0	0	10,616,877	115,705	17,861,995		22,345,192

(a) Including matured endowments (but not guaranteed annual pure endowments) unpaid amounting to $ 0 in Column 3 and $ 0 in Column 7.
(b) Include only portion of disability and accident and health claim liabilities applicable to 'accrued' benefits. Reserves (including reinsurance assumed and net of reinsurance ceeded) for unaccrued benefits for Ordinary Life Insurance $2,413, 573, Individual Annuities $0, Credit Life (Group and Individual) $0, and Group Life $12,956,605 are included in Page 3, Line 1, (See Exhibit 5, Section on Disability Disabled Lives); and for Group Accident and Health $51,696,742, Credit (Group and Individual) Accident and Health $0 and Other Accident and Health $141,142,581.

EXHIBIT 8- CLAIMS FOR LIFE AND ACCIDENT AND HEALTH CONTRACTS

Part 2- Incurred During the Year

	1	2	Ordinary			6	Group		Accident and Health		
			3	4	5		7	8	9	10	11
	Total	Industrial Life (a)	Life Insurance (b)	Individual Annuities	Supplementary Contracts	Credit Life (Group & Individual)	Life Insurance (c)	Annuities	Group	Credit (Group & Individ)	Other
1. Settlement during the year											
1.1 Direct	1,300,755,096	0	90,400,886	866,129,363	27,231,395	0	44,078,445	128,439,825	81,222,842	0	63,252,340
1.2 Reinsurance assumed	223,069,399	0	1,775,243	0	0	0	0	222,295,502	(1,346)	0	0
1.3 Reinsurance ceeded	207,156,678	0	5,772,617	142,270,069	0	0	12,115,440	967,977	45,042,361	0	988,214
1.4 Net	(d) 1,317,667,817	0	86,403,512	723,859,294	27,231,395	0	31,963,005	349,767,350	36,179,135	0	62,264,126
2. Liability December 31, current year from Part 1											
2.1 Direct	90,785,741	0	23,985,682	11,294,125	0	0	12,515,560	482,767	19,955,269	0	22,552,338
2.2 Reinsurance assumed	384,995	0	384,965	0	0	0	0	0	0	0	0
2.3 Reinsurance ceeded	13,626,247	0	3,278,919	5781,164	0	0	1,898,683	367,061	2,093,274	0	207,145
2.4 Net	77,544,459	0	21,091,728	5,512,961	0	0	10,616,877	115,705	17,861,995	0	22,345,192
3. Amounts recoverable from reinsurers December 31, current year	3,175,817	0	2,421,112	62,900	0	0	410,439	0	273,173	0	8,193
4. Liability December 31, prior year											
4.1 Direct	80,025,656	0	20,033,971	0	0	0	19,832,785	0	19,487,121	0	20,671,779
4.2 Reinsurance assumed	455,769	0	455,769	0	0	0	0	0	0	0	0
4.3 Reinsurance ceeded	15,175,007	0	1,665,262	0	0	0	10,041,396	0	2,878,874	0	589,475
4.4 Net	65,306,418	0	18,824,478	0	0	0	9,791,389	0	16,608,247	0	20,082,304
5. Amounts recoverable from reinsurers December 31, prior year	920,325	0	143,961	172,468	0	0	207,033	0	331,686	0	65,177
4. Totals											
4.1 Direct	1,311,515,180	0	94,352,597	877,423,488	27,231,395	0	36,761,220	128,922,591	81,690,990	0	65,132,898
4.2 Reinsurance assumed	223,998,595	0	1,704,439	0	0	0	0	222,295,502	(1,345)	0	0
4.3 Reinsurance ceeded	207,863,410	0	9,663,425	147,941,666	0	0	4,176,133	1,335,038	44,198,248	0	548,900
4.4 Net	77,544,458	0	86,393,611	729,481,822	27,231,395	0	32,585,087	349,883,055	37,491,396	0	64,583,998

(a) including matured endowments (but not guaranteed annual pure endowments) amounting to $0 in Line 1.1, $0 in Line 1.4, $0 in Line 6.1 and $0 in line 6.4.
(b) including matured endowments (but not guaranteed annual pure endowments) amounting to $(33,781) in line 1.4, $(33,781) in Line 6.1 and $(33,781) in line 6.4.
(c) including matured endowments (but not guaranteed annual pure endowments) amounting to $0 in Line 1.1, $0 in Line 1.4, $0 in Line 6.1 and $0 in line 6.4.
(d) includes $6,159,591 premiums waived under total and permanent disability benefits.

Unearned Premium Reserves

Life insurance policy reserves in Part A generally qualify to be treated as tax basis life insurance reserves. Ordinary life insurance policies may be whole life, term life or endowment life, but the reserves for any of these policy forms will usually qualify as life insurance reserves. However, under group term life and credit life insurance policies, unearned premium reserves are examples of policy reserves that often fail to satisfy the actuarial requirements of IRC section 816(b)(1)(A) and, thus, will not qualify as life insurance reserves. Traditional mean reserves for one-year term group life insurance policies are equal to one-half the tabular net valuation premium. If the policy reserves are determined in this manner, they will qualify as tax basis life insurance reserves, provided actual ages and net valuation premiums based on recognized mortality tables are used. However, if the reserves are computed by a gross unearned premium method, the reserves do not qualify as life insurance reserves. Moreover, such reserves may not be included as UPR in the numerator of the reserve ratio test.

Annuity policy reserves in Part B also generally qualify to be treated as life insurance reserves. Group annuity deposit-type contracts are used to accumulate funds to provide retirement benefits for employees under qualified pension plans. Before employees retire and they begin to receive their pensions, deposit funds are held by the insurance company as active life reserves. These active life reserves may be reported in Exhibit 8 or they may be reported elsewhere in the annual statement (as for example, in Exhibit 10). Even if these reserves are reported in Exhibit 8, if the group annuity contract does not contain permanently guaranteed annuity purchase rates, that will be used by the insurance company to charge the deposit fund for the cost of guaranteeing the pension when the employee retires, then the active life reserves do not qualify as tax basis life insurance reserves. Under IRC section 816(f), these reserves are excluded from both the numerator and denominator. However, if the insurance company guarantees the pension at the time the employee retires, the company will then set aside a retired life annuity reserve in Exhibit 8 for that pension, and these retired life reserves will qualify as life insurance reserves. This treatment for group annuity deposit contracts also applies to individual deferred annuity contracts. Under such contracts, the accumulated deposits paid in under the contract may eventually be applied, at the policyholder’s election, to acquire an immediate annuity at a deferred retirement age. Individual deferred annuity contracts typically include minimum guaranteed annuity purchase rates which, at the time an immediate annuity election is made, are applied to the accumulated deposits to determine the annuity benefit. Single premium immediate annuity contracts, which guarantee an annuity income for the life of an individual, or for a guaranteed period and then for life, may be purchased directly by individuals by the payment of a single premium to the insurer. Reserves held in Exhibit 8 for such contracts will also qualify as life insurance reserves. However, if the annuity is payable only for a guaranteed period of time, whereby none of the annuity payments depend on the survivorship of the annuitant, then any reserves held in Exhibit 8 for such an annuity will not qualify as life insurance reserves. This form of annuity is called an annuity certain. Annuity reserves are also held in Exhibit 8 for another form of group contract called a group single premium annuity contract. This form of contract, also purchased by the payment of a single premium, is used to provide guaranteed immediate and deferred retirement annuities for a group of individuals if the qualified pension plan which covered the individuals should terminate, or for other reasons. Annuity reserves under such contracts will qualify as life insurance reserves if the annuity payments to

the individual annuitant depend on survivorship.

Other Reserves

Supplementary Contracts with Life Contingencies- These are shown in Part C and will normally qualify as life insurance reserves. Supplementary contracts are agreements under which the death benefit proceeds of a life insurance policy are paid to the beneficiary by a series of payments rather than in a lump sum, and constitute a full settlement of the life insurance contract. If the supplementary contract provides that the settlement payments are contingent upon the life of the beneficiary, even if the contract guarantees the payout of the original death benefit amount, the supplementary contract is classified as one "with life contingencies." In effect, the settlement becomes an immediate life income annuity. If the settlement payments do not depend on the survivorship of the beneficiary, but are paid only for a specified period, the supplementary contract is classified as one "without life contingencies," and the reserves for that type of contract are reported in Exhibit 10 of the annual statement. The reserves for supplementary contracts "without life contingencies" will not qualify as life insurance reserves under the Internal Revenue Code, because the settlement payments do not depend on the life of the beneficiary.

Reserves for accidental death benefits- Shown in Part D, and if actuarially computed will qualify as life insurance reserves. Accidental death benefits under an ordinary life insurance policy are supplemental to the basic death benefit, and are offered as an optional additional benefit for an additional premium charge. The accidental death benefit typically equals the basic death benefit and, when it does, the underlying policy is called a "double indemnity" policy.

Reserves for disability benefits- Those under life insurance policies are shown separately between reserves for active lives and reserves for disabled lives. Active life reserves are shown in Part E, and disabled life reserves are shown in Part F. Active life reserves are established to set aside funds to provide for waiver of premium benefits and other disability type benefits in the event an insured person becomes disabled. Under a waiver of premium provision, the basic death benefit insurance remains in effect, but the required policy premiums are waived while the insured remains disabled. Other disability type benefits include income benefits and extension of group life insurance to disabled employees. Disability benefits under ordinary life insurance policies are offered as optional supplemental benefits for additional premium charges. If the active life disability reserves for ordinary life insurance policies are actuarially computed, they will qualify as life insurance reserves. Disabled life disability reserves are established when the insured person becomes disabled and the claim is incurred. If disabled life disability reserves under ordinary life insurance policies are actuarially computed, they will also qualify as life insurance reserves (Rev. Rul. 70–190). Under group term life insurance contracts, which are cancelable life insurance contracts, active life and disabled life disability reserves will not qualify as life insurance reserves under the Code. However, since the disability provisions under most group term life insurance contracts usually take the form of an extension of the death benefit coverage to disabled employees (occasionally referred to as a "waiver of premium" provision), some courts have held that reserves for disabled lives, but not for active lives, maintained under such a group life provision will qualify as life insurance reserves provided the reserves are actuarially computed.

Miscellaneous additional policy reserves- These are shown in Part G. They may or may not qualify as life insurance reserves. Examples of such reserves are: Deficiency reserves, which are specifically excluded from life insurance reserves by the Code.

Deficiency reserves, however, will generally be implicitly included with basic policy reserves reported in Part A. Reserves for immediate payment of claims will usually quality as life insurance reserves if actuarially computed. These additional reserves are held if, in rare cases, the basic death benefit reserves held in Part A did not reflect this claim payment assumption. Reserves for nondeduction of deferred fractional premiums, and for the return of any unearned premiums, on the death of the insured will qualify as life insurance reserves if actuarially computed. The nondeduction reserve is held if, after the death of the insured, the remaining fractional premiums due for the current policy year are not deducted from the death benefit, and the basic policy reserve reported in Part A was calculated by the mean reserve method. The reserve for return of unearned premiums is held if the unearned portion of the premiums paid for coverage after the death of the insured is returned at death, but only if this policy provision was not reflected in the basic policy reserve reported in Part A.. As a tax matter, the IRS will determine if any miscellaneous reserves reported in Part G, that otherwise would qualify as life insurance reserves, were not already implicitly included in the reserves reported in other Parts of Exhibit 8. A list illustrating those reserves and liabilities that do not generally qualify as life insurance reserves is included under Treas. Reg. 1.801(4)(e). Although this regulation was originally promulgated under former IRC section 801 of the 1959 Act, it applies as well to IRC section 816 of the current tax code.

Chapter 12 RESERVES FOR INCOME TAX PURPOSES (IRC Section 807)

This section describes the rules laid out in IRC section 807 that govern the deduction from taxable income that life insurance companies are permitted with respect to reserves. TRA 1984 incorporated major changes in such reserve deductions, foremost of which was the introduction of specific computational rules in the Code for determining tax basis life insurance reserves and for certain other reserves. The computational rules for life insurance reserves are prescribed in IRC section 807(d). Additional special rules for computing reserves are prescribed in sections 807(e), 811(c)(1), 811(d) through 812 and adjustment rules for changes in the computation of reserves are prescribed in IRC section 807(f).

Effect of Reserves on Taxable Income

Under IRC section 805(a)(2), a life insurance company is allowed to deduct the net increase during the tax year in those reserves listed in IRC section 807(c). Conversely, under IRC section 803(a)(2), **the company must include in gross income any net decrease in such reserves during the tax year.** The net increase or decrease in the applicable tax basis reserves is determined by comparing the closing and opening balances of these reserves [decrease under IRC section 807(a) and increase under IRC section 807(b)]. The closing balance of the reserves is always reduced by the amount of the policyholders' share of tax-exempt interest and, in the case of mutual life insurance companies, by any excess of policyholder dividends over the company's Differential Earnings Amount determined under IRC section 809.

Reserves Taken Into Account —The specific categories of reserves that are taken into account for the purpose of measuring the net increase or decrease in tax basis

reserves are listed in IRC section 807(c). Six categories of reserves and items similar to reserves are listed, as follows (these appear in the same order as they do in the Code):

- Life insurance reserves [as defined in section 816(b)].
- Unearned premiums and unpaid losses included in total reserves under IRC section 816(c)(2).
- Amounts discounted at the appropriate interest rate necessary to satisfy those obligations under insurance and annuity contracts which do not currently involve life, accident or health contingencies.
- Dividend accumulations and other amounts held at interest under insurance and annuity contracts.
- Premiums received in advance and liabilities for premium deposit funds.
- Reasonable special contingency reserves established and maintained to provide insurance for retired persons and/or premium stabilization under group term life or A & H insurance contracts.

Non-contingency Reserves Under IRC section 807(c)(3)

For the purpose of determining the tax basis reserve amount under IRC section 807(c)(3), the interest rate that is used for discounting is the highest of three interest rates: the Applicable Federal interest Rate (AFR); the Prevailing State assumed interest Rate (PSR); and the underlying interest rate used by the life insurance company in determining the guaranteed benefit. The AFR and the PSR are defined in IRC section 807(d). In the case of the third interest rate, the company's underlying rate, it may be the interest rate implicit in determining the guaranteed benefit obligations for which the liability is established, or it may be the interest rate(s) implicit in the gross premium charge for the guaranteed benefits. The identification of the appropriate underlying rate will depend on the specific character of the benefit obligation that is guaranteed and discounted for interest. The underlying interest rate may not be identified by a simple reference to the reserve item in the annual statement, detailed informaiton is required to determine it. In any event, the tax basis discounted value of any reserve item that is classified under IRC section 807(c)(3), may not be less than the net surrender value, if any, available under the contract.

Unpaid Loss Reserves Under IRC section 807(c)(2)

For the purpose of determining the amount of the unpaid loss reserves under IRC section 807(c)(2), the discounting rules of IRC section 846 shall apply for tax years after 1986 (TRA 1986). Section 846 was enacted primarily to define rules for discounting unpaid loss reserves under casualty insurance policies of property and casualty insurance companies. However, the rules were extended to life insurance companies, but only with respect to their casualty-type business, namely A & H insurance contracts. These rules do not apply to loss reserves under life insurance contracts. In regard to unpaid loss reserves under A & H insurance contracts, there has been some uncertainty as to whether these discounting rules apply only to claim reserves held in Exhibit 9 of the Annual Statement, or to both claim reserves and claim liabilities held in Exhibit 11. It appears that IRC section 846 rules apply to both types of unpaid losses under A & H insurance contracts, since IRC section 807(c) cross-references IRC section 805(a)(1) in describing the scope of the rules to life insurance company unpaid losses, and that section deals with deductions for accrued claims. Disabled lives reserves for disability income benefits under noncancelable or guaranteed renewable contracts are normally

treated as life insurance reserves under section 816(b) and valued as IRC section 807(c)(1) reserves. Therefore, such loss reserves would not be subject to IRC section 846. Under the special rules of IRC section 846(f)(6), applicable to A & H insurance, the interest rate for discounting unpaid loss reserves shall be the AFR in effect for the year in which the claim incident occurred. For disability income unpaid losses under cancelable contracts, the insurance company may use a mortality or morbidity table that reflects the taxpayer's experience. For all other A & H unpaid losses, the insurance company may assume that the unpaid losses will be paid in the middle of the year following the year the claim incident occurred. That means that the discounted unpaid loss reserve should reflect one-half year's interest discount at the applicable interest rate.

Life Insurance Reserves Under IRC section 807(c)(1)

The most significant effect that TRA 1984 had on reserve deductions was with respect to life insurance reserves. This category of reserves is defined by IRC section 816(b), but TRA 1984 changed the permitted amount of these reserves for deduction purposes. Prior to the 1984 tax law, the reserve deduction for life insurance reserves were the statutory reserves with certain tax basis adjustments. With the enactment of TRA 1984, life insurance reserves, for purposes of determining a company's taxable income, must be computed by the rules of IRC section 807(d). The following will summarize the substance of these computational rules.

Federally Prescribed Reserve

When the life insurance reserve for any contract is calculated by the rules of IRC section 807(d)(2), the reserve amount is often called the "Federally Prescribed Reserve" (FPR). Although the Internal Revenue Code does not use this term, it will be used throughout this discussion. The amount of the FPR for a contract is determined by applying prescribed standards for each of three elements that comprise the actuarial basis of the reserve for that contract, as Tax Reserve Method; Interest Rate; and Prevailing Commissioners' Standard Mortality or Morbidity Table. The prescribed standards for each of these three elements are described in IRC section 807(d). These will be discussed in General Computational Rules for Federally Prescribed Reserves.

The final amount of the tax basis life insurance reserve for any contract will not necessarily be the calculated FPR. Under IRC section 807(d)(1), that reserve amount shall be the greater of the FPR and the Net Surrender Value (NSV) of the contract. The NSV of a contract is defined as its cash surrender value, less any penalty or charge deducted on surrender, but disregarding any market value adjustment that may be added or subtracted on surrender. Essentially, the NSV is the cash equivalent amount that the policyholder would be entitled to if the policyholder canceled the policy prior to death or maturity. Thus, the NSV becomes a minimum limitation for the FPR in the event the calculated FPR is less than the NSV. Moreover, the tax basis life insurance reserve may not exceed the contract's Statutory Reserve (SR) actually held in the company's annual statement. At all times, therefore, the maximum limitation for the contract's FPR is its Statutory Reserve. For tax purposes, a company must perform a dual valuation of its life insurance reserves by calculating a FPR in addition to the SR for each contract for which it holds life insurance reserves. After doing that, it must compare the calculated FPR against the NSV, and the Statutory Reserve, to ensure that the FPR falls within the minimum-maximum limitations.

The Code and the committee reports to the 1984 Act indicate that this minimum-maximum comparison for the FPR should be performed on a contract-by-contract basis. This presupposes that life insurance companies will calculate the FPR and the Statutory Reserve on a seriatim basis. Notwithstanding that, the committee reports indicate that the minimum comparison of the FPR to the NSV may be performed by grouping policies with similar characteristics. It is not clear how this could be done, nor is it very practical to do so if the grouping method could not also apply to the maximum comparison to the SR. As a matter of practice, life insurance companies rely on their data processing capacity to perform the seriatim comparison and, in fact, do it that way. If grouping approximations were used, it is important from a tax standpoint that the methods used did not result in significantly overstated deductions for the life insurance reserves.

Several other important conditions are placed on these minimum-maximum FPR comparisons. Except for the designated tax reserve method, interest rate and commissioners' tables that must be used to calculate the FPR, the calculation of the FPR must be done on the same actuarial basis as the statutory reserves. For example, if the statutory reserve was calculated using continuous timing functions, or if the mean reserve method was used, then the FPR must be calculated in the same manner. If the mean reserve method was used, then for fractional premium policies there will be deferred fractional premiums as of the statement date. It is required that the tax basis life insurance reserve be adjusted so that the reserve will not be overstated by the effect of such premiums. The reserve must also be adjusted to remove the effect of any premiums due prior to the statement date that were uncollected as of that date. The reason for these adjustments is to properly match income with deductions, because these deferred and uncollected premiums may not be included in the company's gross income until received. In adjusting the calculated FPR for net deferred and uncollected premiums, the net premiums to be used are those by which the FPR is calculated.

Accordingly, statutory reserves are adjusted for net deferred and uncollected premiums on the corresponding statutory reserve basis. The minimum-maximum comparisons should be performed after the premium adjustments have been made for each contract. It may be found that some companies will make the adjustment for deferred and uncollected premiums on an aggregate basis after the seriatim comparisons have been made, frequently subtracting the statutory deferred and uncollected premiums as a conservative measure. If the adjustment was made that way, the company must make certain that it did not result in any significant overstatement of tax basis life insurance reserves. Reserves for all benefits under the contract should be reflected in the FPR comparisons. This is a critical condition because, if any supplementary benefits under the contract are not included prior to the comparison, the NSV minimum limitation might prevail. This could result in a greater tax basis reserve than would otherwise be the case, because many benefits supplementary to the basic benefit do not have cash surrender values. Under IRC section 807(e), there are some exceptions to this general condition. These exceptions pertain to certain designated supplemental benefits, certain substandard risks and certain benefits under some pre-1989 contracts. These exceptions will be explained in text 4.6.3, paragraph (8). The FPR, as calculated by the Federal tax reserve standards, is not permitted to include any deficiency reserve. Simply put, that means that the valuation net premiums calculated by the Federal standards must be used to calculate the FPR, even if those net premiums are greater than the actual gross premiums charged. However, in the comparison to the statutory reserve, any deficiency reserve included in the contract's statutory reserve is allowed to

be included for purposes of the maximum FPR limitation. Hence, if the maximum limitation prevails, and the SR becomes the contract's tax basis life insurance reserve, it will reflect that deficiency reserve. Pursuant to IRC section 811(d), excess interest reserves under any contract should be excluded from the FPR and statutory reserve. Excess interest reserves arise when any interest that is guaranteed to be credited to the contract beyond the end of the tax year is computed at an interest rate that exceeds the greater of the AFR and the PSR in effect for the contract. Simply put, this restriction means that the FPR and SR shall be computed as if such interest guarantees applied only to the end of the tax year.

General Computational Rules for Federally Prescribed Reserves:

The Federal prescribed factors for calculating the FPR are set forth in IRC section 807(d)(2). They consist of three computational factors that define the Federal actuarial basis for life insurance reserves. The three factors consist of a tax reserve method; an interest rate; and a mortality or morbidity table. The purpose of using Federal reserve factors is to limit the amount of tax deductible life insurance reserves to the minimum level under the prevailing valuation standards of the States. Even though the minimum reserve standards of the States apply on an aggregate basis to all of a company's life insurance and annuity reserves, the federal factors must be applied to each separate contract to which the factors apply. These actuarial factors will be described in detail in the following paragraphs.

Tax Reserve Methods

Under IRC section 807(d) (3), the specific reserve method that must be used will depend on the type of contract for which the FPR is calculated. A reserve method becomes a prescribed tax reserve method when it is designated by the NAIC as a prescribed method for statutory reserves. The tax reserve methods by type of contract are life insurance—CRVM; annuity—CARVM; noncancelable A & H—two-year full preliminary term; and long-term care—one-year preliminary term. If a particular contract is not in one of these categories, the method to be used will be the NAIC prescribed valuation method that applies to that contract at the contract's issue date. Interpretation of CARVM or CRVM should be that prescribed by NAIC in the year the contract is issued. If the NAIC has not prescribed a valuation method for a particular type contract, the method to be used will be a method that is consistent with a prescribed tax reserve method and is most appropriate for that type of contract at its issue date. Under the 1984 Act, a limited exception is permitted for noncancelable A & H contracts. Under this exception, a company that calculated its statutory reserves for these contracts by the net level method may elect to calculate its tax reserves by the same method, provided at least 99 percent of the applicable reserves are calculated by the net level method and the company continues to use the net level method for both statutory and tax purposes. Under CARVM, surrender charges under annuity contracts must be deducted from the annuity reserve. For annuity contracts issued before 1985, contingent surrender charges must be deducted from tax reserves. For annuity contracts issued after 1984, contingent surrender charges are deducted only if the contract's "bail-out" interest rate is not greater than the PSR applicable to a whole life insurance contract. A policyholder may surrender an annuity contract and not incur a contingent surrender charge if the actual interest rate credited by the company falls below the "bail-out" rate.

Interest Rates

For contracts issued after 1987, the applicable interest rate to be used is the greater of the AFR and the PSR. For contracts issued before 1988, the applicable rate is simply the PSR.

PSR- The Prevailing State (interest) Rate is the prevailing State assumed interest rate is defined in IRC section 807(d)(4)(B). For any insurance or annuity contract, it is the highest interest rate permitted by the majority of states to be used in calculating statutory life insurance reserves for that type of contract. The rate is determined as of the beginning of the calendar year in which the contract was issued. Prior to 1988, for non-annuity contracts only, a company could elect to use the PSR for the preceding calendar year. This election option was repealed by OBRA 1987, and it is no longer available for contracts issued after 1987. OBRA 1987 also repealed the requirement that the PSR for whole life insurance contracts be used for noncancelable A & H contracts when no such rate was prevailing for such contracts.

AFR- The Applicable Federal (interest) Rate is defined in IRC section 807(d)(4)(A). This rate was introduced by OBRA 1987, and it is the interest rate to be used in calculating the FPR for a contract issued after 1987, if the AFR for any calendar year is higher than the PSR otherwise applicable to the contract. The AFR is the same interest rate used to discount casualty type loss reserves under IRC section 846. An election may be made by the company to recompute its tax basis life insurance reserves every five years, for all contracts issued in a given calendar year, by using the higher of the new AFR established for that fifth calendar year and the original PSR. This may be done only if the new AFR has changed by at least 0.5 percent from the previously used AFR. Once a company makes this election for a given block of contracts, the life insurance reserves must be recomputed in this manner every five years, unless the company obtains the Secretary's consent to revoke the election. Change in reserves resulting from this election is not treated as a change in basis.

Mortality and Morbidity Tables

The mortality or morbidity tables that must be used to calculate the FPR are defined in IRC section 807(d)(5). They are referred to as the prevailing commissioners' standard tables. For any type contract, the prevailing table is the most recent commissioners' standard table (as prescribed by the NAIC) permitted to be used by the majority of states in calculating statutory minimum reserves for that type contract at the time it was issued. When a prevailing table is replaced by a new table, a company may elect to continue calculating its life insurance tax reserves by using the former table in lieu of the new table for a period of three years. The three year period begins with the calendar year following the year the new table became prevailing. There are special rules on the application of prevailing tables. For any contract issued prior to 1948 for which there was no commissioners' standard table when it was issued, the table to be used is the one used in calculating the statutory reserves. For any contract issued after 1947 for which there was no commissioners' standard table when it was issued, the table to be used will be provided by Treasury regulations (see Treas. Reg. Sec. 1.807–1, December 1989). If multiple tables exist, or multiple options under a single table are available, which otherwise satisfy the general requirements for a prevailing table, the table or option to be used is the one that generally produces the lowest reserves.

Source of Interest Rates and Tables

The required interest rates and prevailing tables for calculating the Federal Prescribed Reserve are obtained from published revenue rulings. Applicable revenue rulings that have been published are Rev. Rul. 92–19 and supplements provided in Rev. Rul. 93–58 Rev. Rul. 94–11 and Rev. Rul. 95–4. These four rulings provide a complete array of PSRs and AFRs. New revenue rulings are and will be issued for future years.

Special Rules for Computing Federal Prescribed Reserves

In determining the tax basis life insurance reserve for any contract, IRC section 807(d)(1) requires that the calculated FPR shall not be less than the contract’s Net Surrender Value.

Net Surrender Values

IRC section 807(e)(1) provides a definition of a contract’s NSV. In general, the net surrender value of any contract is its cash surrender value, as defined under the contract, reduced by any penalty or charge which may be imposed when the contract is surrendered. For tax reserve purposes, however, the NSV should not reflect any "market value adjustment" that might otherwise be required at the termination and surrender of a contract for its cash value. Market value adjustments are made under certain contracts when they are terminated and a cash distribution is made, so as to adjust its cash distribution value from a book to a market value in recognition of any difference between a new money interest rate and the actual interest rate the contract’s assets were earning at the time of its surrender. A market value adjustment decreases the NSV if the new money rate is higher than the contract’s actual earnings rate, and it increases the net surrender value if the converse is true. Group annuity contracts frequently have these market value adjustments imposed at surrender. For group annuity contracts, also referred to as group pension contracts, the net surrender value shall be determined as the balance in the "policyholder’s fund," reduced by any penalty or forfeiture imposed on surrender, but ignoring any market value adjustment. Pension plan contracts are explicitly defined under IRC section 818(a).

Group Contract Issue Date:

In calculating a contract’s FPR, the interest rate and the mortality/morbidity table are determined by reference to the contract’s date of issue. For individual contracts, the date of issue is specified on the policy form. For any group insurance or annuity contract, IRC section 807(e)(2) defines the date of issue as, generally, the date the master plan is issued. However, if a benefit becomes guaranteed to a participant after the master plan issue date, then the date the benefit becomes guaranteed must be used as the issue date for calculating the FPR for those benefits.

Supplemental Benefits

In general, all benefits under a single contract must have their life insurance reserves recomputed by the Federal reserve standards of IRC section 807(d)(2), and that total FPR for all benefits combined must be compared to the contract’s NSV under IRC section 807(d)(1). However, IRC section 807(e)(3) provides special treatment for certain specified supplemental benefits for which separate statutory reserves are held by the life insurance company in its annual statement. For any of the listed supplemental

benefits, the reserves do not have to be recomputed by the Federal standards. Rather, the statutory reserves for those supplemental benefits are used, and those statutory reserves are then added to the FPR for all other contract benefits before the NSV comparison is effected. Furthermore, if any of the listed supplemental benefits meet the definition of a "qualified FPR supplemental benefit," then such a benefit may be treated as if it was provided under a separate contract in determining the total tax reserve. That means, for a "qualified supplemental benefit," the statutory reserves are used, but those statutory reserves are added in as life insurance tax reserves after the NSR comparison is effected for all other benefits under the base contract. This special treatment, permitted under IRC section 807(e)(3)(A), will often result in a higher tax reserve for the contract than if the reserve comparison had included the qualified supplemental benefit. That result will occur when the NSV exceeds the FPR for all other benefits under the contract, thus becoming the tax reserve for those benefits, to which the statutory reserve for the qualified supplemental benefit is added to produce the contract's total tax reserve. In order to be eligible for special treatment, the benefit must be one of the supplemental benefits listed in IRC section 807(e)(3)(D), which are guaranteed insurability; accidental death or disability benefit; convertibility; disability waiver benefit; and other benefits prescribed by regulations. In order for any of the listed supplemental benefits to be treated as a "qualified supplemental benefit," the supplemental benefit must satisfy the two requirements specified under IRC section 807(e)(3)(C): A separate premium or charge for the supplemental benefit is identifiable, and the NSV of any of the contract's other benefits is not available to fund the supplemental benefit.

Substandard Risks

IRC section 807(e)(5)(A) also provides for special treatment with respect to substandard risks, similar to that given to qualified supplemental benefits. The amount of any life insurance reserve for any "qualified substandard risk" is also computed separately from all other benefit reserves under the contract. That is, the separate tax reserve for such substandard risks is not included with other tax reserves under the contract before the comparison is made with the NSV. However, in contrast to a reserve for a qualified supplemental benefit, the reserve for a qualified substandard risk must be computed using the federal reserve standards of IRC section 807(d)(2); the tax reserve is not simply the statutory reserve, as would be the case for the supplemental benefit. In order for a substandard risk to be deemed "qualified," the following requirements under IRC section 807(e)(5)(B) must all be satisfied: A separate statutory reserve for the risk must be maintained in the company's annual statement. A separate premium or charge for the risk is identifiable. The NSV under the contract may neither be increased nor decreased in value because of such risk. The NSV under the contract cannot be used regularly to pay premium charges for such risk. Two limitations apply to the reserve for qualified substandard risks, as provided under IRC section 807(e)(5)(C) and (D), as follows: The amount of the life insurance reserve cannot exceed the sum of the separately identifiable premiums charged for the risk, plus interest and less mortality charges for the risk. The aggregate amount of insurance in force under those contracts to which the special rule of IRC section 807(e)(5)(A) applies may not exceed 10 percent of the company's total insurance in force under all of its life insurance contracts (excluding its term insurance). For any insurance in force above the 10 percent limitation, the substandard risk is reflected by an appropriate adjustment to the prevailing mortality table otherwise used to compute the FPR for the contract's underlying benefits, as opposed to adding an additional FPR to cover the substandard risk.

Certain Term Life Insurance and Annuity Benefit Riders

Special treatment under IRC section 807(e)(6)(A) is given to certain term insurance and annuity benefits issued as riders under life insurance contracts issued before 1989. The special treatment is the same as provided to qualified supplemental benefits and qualified substandard risks, in that a separate computation of the tax basis life insurance reserve is allowed and that reserve is excluded from all other contract reserves in the comparison with the contract's NSV. However, as for qualified substandard risks, the tax basis reserve must be computed using the Federal reserve standards of IRC section 807(d)(2). A life insurance contract under which this special treatment is provided must have been issued before 1989 under a plan of insurance filed by the life insurance company issuing that contract in at least one State before 1984, and that plan of insurance is currently on file in the appropriate State for that contract The specific term insurance or annuity benefits for which the special treatment applies must meet the same two requirements for supplemental benefits to be considered "qualified" , as follows: A separate premium or charge for the rider benefit is identifiable. The NSV for any of the contract's other benefits is not available to fund the applicable term insurance or annuity benefit.

Unearned Premium Reserves on Cancelable A & H Contracts

Under IRC section 807(e)(7), special rules apply in respect to the recognition for tax deduction purposes of unearned premium reserves and premiums received in advance held under any insurance contracts not described in IRC section 816(b)(1). The contracts for which these rules do apply, therefore, are cancelable A & H insurance contracts, which are primarily group A & H insurance contracts. The general rule under IRC section 807(e)(7)(A) is that only 80 percent of the unearned premium reserves and advanced premiums that the company would otherwise have included as reserve balances under IRC section 807(a) and (b) shall be included as reserve balances under those respective sections. The 20 percent reduction in these types of deductible reserves became effective for taxable years beginning on or after September 30, 1990. A transitional rule under IRC section 807(e)(7)(B) applies for taxable years beginning on or after September 30, 1990, but not beginning after September 29, 1996. Thus, the transition period is six (6) taxable years. Under this transitional rule, the life insurance company must include in its gross income, for each of the six transition taxable years, an amount equal to $3–{}^{1}/_{3}$ percent of its closing reserve balance for its relevant IRC section 807(e)(7) unearned premium reserves and advance premiums for the company's most recent taxable year beginning before September 30, 1990. Thus, if the company's first transition tax year was 1991, then its opening and closing reserve balances for the 1991 tax year would be 80 percent of the relevant reserves, but it would include in its 1991 gross income $3–{}^{1}/_{3}$ percent of its 1990 closing reserve balance for the relevant reserves. Then, for its 1992 tax year, it would include in that year's gross income another $3–{}^{1}/_{3}$ percent of its 1990 closing reserve balance for the relevant reserves; and, so on, for the rest of its transition years, with the last $3–{}^{1}/_{3}$ percent in the 1996 tax year.