



A Core Curriculum for Insurance Supervisors

ICP 12C: Life Insurance Financial Analysis

Basic-level Module



THE WORLD BANK

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About the Core Curriculum

A financially sound insurance sector contributes to economic growth and well-being by supporting the management of risk, allocation of resources, and mobilization of long-term savings. The insurance core principles (ICPs), developed by the International Association of Insurance Supervisors (IAIS), are key international standards relevant for sound financial systems.

Effective implementation of the ICPs requires skilled and knowledgeable insurance supervisors. Recognizing this need, the World Bank and the IAIS partnered in 2002 to develop a “core curriculum” for insurance supervisors. The Core Curriculum Project, funded and supported by various sources, accelerates the learning process of both new and experienced supervisors. The ICPs provide the structure for the core curriculum, which consists of a set of modules that summarize the most relevant aspects of each topic, focus on the practical application of supervisory concepts, and cross-reference existing literature.

The core curriculum is designed to help those studying it to:

- Recognize the risks that arise from insurance operations
- Know the techniques and tools used by private and public sector professionals
- Identify, measure, and manage these risks
- Operate effectively within a supervisory organization
- Understand the ICPs and other IAIS principles, standards, and guidance
- Recommend techniques and tools to help a particular jurisdiction observe the ICPs and other IAIS principles, standards, and guidance
- Identify the constraints and identify and prioritize supervisory techniques and tools to best manage the existing risks in light of these constraints.

Note to learner

Welcome to ICP 12: Life insurance financial analysis module. This is a basic-level module on life insurance financial analysis that does not require specific prior knowledge of this topic. It is one of several prepared for ICP 12 on reporting to supervisors and offsite monitoring. Its purpose is to describe some of the methods that are useful for analyzing the financial information provided to the supervisory authority. The module should be useful to either new insurance supervisors or experienced supervisors who have not dealt extensively with the topic or are simply seeking to refresh and update their knowledge.

Start by reviewing the objectives, which will give you an idea of what a person will learn as a result of studying the module, and answer the questions in the pretest to help gauge your prior knowledge of the topic. Then proceed to study the module either on an independent, self-study basis or in the context of a seminar or workshop. The amount of time required to study the module on a self-study basis will vary, but it is best addressed over a short period of time, broken into sessions on sections if desired.

To help you engage and involve yourself in the topic, we have interspersed the module with a number of hands-on activities for you to complete. These exercises are intended to provide a checkpoint from time to time so that you can absorb and understand the material more readily and can apply the material to your local circumstances. You are encouraged to complete each of these activities before proceeding with the next section of the module. If you are working with others on this module, develop the answers through discussion and cooperative work methods. An answer key in appendix III sets out some of the points that you might consider when tackling the exercises and suggests where you might look for the answers.

As a result of studying the material in this module, you will be able to do the following:

1. Given financial reports for comparable periods of life insurers operating in the same jurisdiction, construct basic ratios to analyze:
 - a. The nature of insurance portfolios
 - b. Reinsurance
 - c. Profitability
 - d. Technical provisions
 - e. Assets
 - f. Solvency and capital
2. Compare the various bases for expressing profitability
3. Explain the most significant factors affecting the ultimate cost of insurance for each major line of life insurance business
4. Explain why a life insurer that is growing rapidly may show losses in its financial statements, even if the premiums it is charging are adequate to produce long-term profits
5. Analyze the summary financial statements of a life insurer based on these relationships
6. Assess the impact of reinsurance on the results of a life insurer during a particular period
7. On the basis of the assessment, make preliminary proposals for areas where further investigation may be required or where supervisory concerns are raised
8. Describe the types of information that would often be included in an actuary's report on the results of a valuation of the liabilities of a life insurer
9. Describe some analyzes that a supervisor can perform using information from the actuarial reports
10. Explain how a supervisor can use the results of stress testing done by a life insurer
11. Describe some simple stress tests that a supervisor can perform using information from the financial statements of a life insurer.

Pretest

Before studying this module on licensing, answer the following questions. The questions are designed to help you gauge your existing knowledge of this topic. An answer key is presented in appendix III at the end of the module.

1. The annual statutory returns (financial statements and statistical returns) to the supervisor are prepared:

- a. When the life insurer has the available resources
- b. At the anniversary of the life insurer's commencement
- c. At the end of the life insurer's financial year
- d. By all life insurers on a specified date.

2. The returns received by the supervisor are:

- a. Read and judged as either satisfactory or unsatisfactory
- b. Reviewed in detail with analysis of the accounts
- c. Analyzed using calculations of various ratios
- d. Analyzed using ratios and reviewed and considered along with other information, including results of recent years.

3. The life insurer's financial returns are the responsibility of the chief executive officer and the auditor.

- a. True
- b. False

4. The primary purpose of the returns to the supervisory authority is to:

- a. Ensure the interests of shareholders are met
- b. Ensure the interests of policyholders are met
- c. Comply with the insurance laws
- d. Meet the social needs of the community.

5. Policy liabilities are calculated by:

- a. The actuary
- b. The supervisor
- c. The management
- d. The board.

6. Solvency requirements for a life insurer exist to ensure that it has assets not less than total liabilities plus a margin.

- a. True
- b. False.

7. Life reinsurance is:

- a. Insurance to spread the risk to other insurers under group policies
- b. Insurance to spread the risk on lives with a very adverse medical history
- c. Optional for policyholders to have insurance with a strong insurer
- d. Insurance to spread the risks undertaken by an insurer to a reinsurer.

8. A life insurer should determine premium rates for its products:

- a. From prices charged by competitors
- b. By direction of the board of directors
- c. To ensure long-term solvency on behalf of policyholders
- d. To maximize short-term profits to shareholders.

9. A life insurer's investment policy is constrained in the interests of policyholders.

- a. True
- b. False.

10. A financial condition report is:

- a. Certification that a life insurer is solvent
- b. A freely available document to assist policyholders to understand the insurer's financial condition
- c. A confidential document from the actuary to record an analysis and provide an understanding of the financial outcome from the insurer's operations
- d. A special report to the board from the actuary regarding appropriate dividends payable to shareholders.

11. The value of policy liabilities shown in the financial statements is determined:

- a. From a standard sum-insured-related formula for each product
- b. By an expert following investigation of recent experience applied to the expected future of the business in force
- c. From a series of premium-related formulas for each type of product
- d. As a proportion of the total income received in the year after deducting the amount paid out in claims and expenses.

ICP 12C: Life Insurance Financial Analysis

Basic-level Module

A. Introduction

This module refers variously to insurer, life insurer, reinsurer, life reinsurer, and licensed life insurer. On each occasion (unless specifically stated otherwise), it should be understood that the module is dealing with all licensed life insurance entities that underwrite business in the jurisdiction. It is assumed that the entities prepare financial and statistical returns at a specified date each year—namely, the financial year of the insurer. This date may be specified in legislation and be the same for all companies, or it may be determined by the company itself. In addition, the returns, particularly statistical returns, may be required at more frequent intervals—for example, quarterly. These returns also will be subject to some analysis, but particular care needs to be taken before drawing any conclusions from them.

This module provides some guidance on methods that life insurance supervisors, particularly less experienced supervisors, can use to analyze the financial information obtained about each life insurer. The main sources of information are the regular statutory financial and statistical returns required in relation to each financial period.

Such analysis is a vital part of the overall assessment made about the financial condition of a life insurer. Additional financial information from other reputable sources—for example, the major rating agencies—may also be available and could prove useful in reaching final conclusions. Important information may be available from onsite reviews undertaken in accordance with ICP 13. Reports in the media or comments from competitors can also be useful in alerting the supervisory authority to additional sources of information, but such information needs to be fully verified before conclusions are drawn from it. A separate module—module ICP 12D on qualitative analysis and the

use of other sources of information—has been prepared about the use of these other sources of information

Elements of the analysis

Essentially, the analysis requires the calculation (usually as a percentage) of both the total existing business still in force at the end of the latest financial accounting period (the balance date) and the experience for that period, usually one year. The calculated values are used directly to indicate the degree to which the life insurer satisfies the various requirements of both life insurance legislation and the regulations on solvency, capital, and liquidity, as well as the progress made in operational matters such as new business, claims, expenses, and profitability.

The ratios are calculated for each licensed life insurer and life reinsurer, and the results are then closely compared with the specified statutory criteria and other supervisory indicators. This module discusses some of the issues that need to be considered in that analysis. The analysis covers the company's position at the most recent balance date for which the statements have been provided so as to monitor its compliance with legal requirements and supervisory guidance.

The ratios are also compared with results over recent past years so as to assess the insurer's recent progress in its business operations and whether it has been able to satisfy the financial requirements comfortably. Any trend in the ratio values over those years may also be useful for understanding the insurer's future prospects and may indicate particular matters of concern that warrant further investigation. Comparing the assessments in successive years makes it possible to detect adverse changes in the insurer's financial condition at an early stage, enabling the insurer to take remedial action with or without formal intervention by the supervisory authority.

These ratios are also used in connection with the market analysis described in the module on ICP 11. Comparing the progress and performance of an insurer's life business with those of the market is of interest. The supervisor may require further information to assess the insurer's likely future because the information available is sufficient only to provide a preliminary view and further investigation is needed to confirm that view.

Analyzing the calculated ratios across the licensed insurers in the jurisdiction will, subject to a few caveats, enable the supervisory authority to assess the general soundness of the industry as a whole. For example, a life insurance industry with predominantly traditional endowment and whole life insurance liabilities and with a high proportion of assets invested in equities is a concern to the supervisor if the stock market declines substantially. But if only a small number of insurers have such liabilities, while most insurers have a significant volume of liabilities in investment-linked business, then only those few insurers with the traditional business may encounter serious difficulties in the event of a falling stock market and thus pose a concern for the prudential supervi-

sor. Supervisors must interpret industry-wide ratios with care and avoid making hasty conclusions about the need for industry-wide action.

Results in successive years, if consistently showing an adverse trend, enable the supervisory authority to take the measures, within its powers, that it deems appropriate. For example, the supervisory authority may decide that amendments to the relevant legislation are needed if it is to protect policyholders.

While undertaking the analysis and review, it is important to remember that the value of the assessments made depends on the quality of the data provided and used. Insurers need to submit financial and statistical returns with complete and accurate data, and all insurers need to provide data on the same basis for the period under review. Moreover, insurers need to prepare the data consistently over time. Much depends on the accounting principles and mandatory standards in the jurisdiction and on the quality of the accounting profession. In addition, a high-quality audit of the financial statements and statistical returns is needed at least once a year (ICP 12, essential criterion a).

Nevertheless, the calculated ratios are indicative of the life insurer's condition rather than conclusive. Not only are they dependent on the accounting rules and data quality, but they also are dependent on the proper interpretation of those rules and on assumptions made in calculating the insurer's technical provisions (policy liabilities).

International organizations such as the IAIS, IASB (International Accounting Standards Board), IAASB (International Audit and Assurance Standards Board), and IAA (International Actuarial Association) are working diligently to establish international principles and standards. In due course, it is hoped that there will be less divergence in accounting, auditing, and actuarial standards across jurisdictions. Even so, differences in the environment in different jurisdictions mean that different parameters and assumptions will continue to be used for the accounting and actuarial values contained in financial statements.

When reviewing and assessing the ratios calculated from the data provided, it is essential to consider differences in the composition of the life insurance business actually written by the various insurers. Different insurers are likely to develop particular expertise in marketing different products to their customers, the policyholders. Ratios calculated for the different classes of business such as term insurance, annuities, and so forth vary significantly, and the analysis and assessment of the financial condition of an insurer are affected by the company's overall mix of business.

It is also necessary to recognize how the financial structure mandated for life insurers in the jurisdiction affects the company under review. The total business of the insurer—life insurance business and all other business—may be held in a number of ways:

- As a single fund and account (this would be unusual)
- As a single fund with separate accounts, one for the life insurance business and the other for any other business

- As two separate funds, one for life insurance and one for other business
- As several funds for the life insurance business, with mandated or voluntary separation or some other requirement for some or all classes of the life business—for example, participating and nonparticipating life insurance policies—and a separate fund (or funds) for the other business.

This module assumes that the requirement is for several separate funds for the life business as well as a separate fund (or funds) for any non-life business, including the shareholders' fund. The analysis is in respect of the life funds. It is conducted for each life fund separately and for the insurer's total life business. The final review of the insurer also considers any other business undertaken and shareholders' equity, but these issues are dealt with elsewhere.

Classes of business

Many new life insurance products have been developed in recent years, and the variety of risks carried by them has widened to include new insurance risks and new investment risks. In many jurisdictions, life insurers are now able to write business that bears no traditional insurance risk based on human life. These contracts meet different financial needs and have different financial outcomes than traditional policies. Consequently, the overall financial condition of a life insurer, its capital needs, its profitability, and its operations generally depend on the mix of its business. For purposes of analysis and review, products with similar risks and financial requirements should be allocated to the same class of business.

The classes of business for the purposes of this module are as follows:

- Temporary insurance (term life, accident, disability)
- Permanent life insurance (whole life, endowment), also known as traditional or conventional business
- Lifetime annuities (installment payments payable for the lifetime of the annuitant from a single contribution or premium or from accumulated regular premiums)
- Investment contracts (accumulation contracts with a contractual formula to calculate the amount payable on termination and little or no mortality or morbidity risk)
- Investment-linked policies (market-linked contracts, sometimes with no guarantees and no insurance—mortality or morbidity—risk)
- Fixed-term annuities (installment payments with no longevity risk).¹

1. Some investment-linked contracts have significant mortality risk, such as variable life insurance, or incorporate investment guarantees, such as the segregated funds contracts in Canada and variable annuities in the United States, which have minimum guarantees on death and maturity. The risk characteristics and capital adequacy requirements of such products can differ significantly from those of the more traditional products. Accordingly, they typically are analyzed as separate classes of business.

This module refers to the first three classes as the insurance classes and the last three as the investment classes of business.

Generally, the calculations are made using premium income. Aggregate premiums are used rather than sum insured or number of policies for several reasons, such as the widely different contractual arrangements for policies, the incidence of both individual policies and group contracts that insure many lives with individual benefits in the one contract, and the substantial variation in the size and duration of policies.

The analysis and review need to take into account several characteristics of life insurance as well as of non-life insurance. The varying contract terms and conditions of different classes and products and the different ages and gender of the lives insured should be reflected in the data provided in the statements. In some circumstances, it may be appropriate to adjust the data for a proper evaluation of performance during the year being reviewed. Such adjustments, based on local knowledge of the industry, are necessarily broad based and somewhat arbitrary and should be made only with care and for supervisory purposes. For example, the supervisor reviewing a company may adjust the single premium for review purposes, where the company writes both investment business classes with a single premium for the policy and insurance business classes with annual premiums through the term. The adjustment is “equated” so that the single premium is treated as a proxy annual premium by dividing it by the estimated average duration from commencement to termination of the policy—for example, a period of 10 years. The use of such an approach is not a reliable basis for supervisory intervention.

This module excludes discussion of health insurance.

In summary, for each life insurer, the financial analysis aims to draw conclusions about the current financial condition of the insurer, the likelihood of a sound financial future, and the risks that may lead to problems. It is vital that the financial statements for the analysis be based on sound accounting and actuarial standards and be prepared consistently over time and across the industry. Comparing current results with the results in previous years indicates changes in the company’s financial strength over time. If there is consistent deterioration, the causes should be investigated, and early remedial action might be desirable or necessary, possibly including supervisory action to rectify the position.

Exercises

- 1. What characteristics do the statements received for analysis have to have in order to be useful?**
- 2. Do these conditions exist in your jurisdiction?**
- 3. After calculating relevant ratios, how will you use them?**
- 4. Will all insurers reviewed have similar values? If not, why not?**

Commonly used terms

The following terms are relevant to the financial analysis of life insurance.

- **Financial condition report.** A comprehensive report from a life insurer's accredited actuary to the management and board of the insurer and to the supervisory authority.
- **Incurred but not reported (IBNR) claims.** Claims incurred but not reported before the balance sheet date. It is anticipated that claims on a number of policies have occurred but not yet been reported and therefore are likely to result in a liability on the life insurer.
- **Reported but not admitted (RBNA) claims.** Provisions for claims that have been reported before the balance sheet date but are not yet admitted as a liability on the life insurer. It is anticipated that a number of these claims will subsequently be admitted and result in a liability on the insurer.
- **Unearned premium provision (UPP).** A provision in respect of the proportion of the premium paid before the balance date for the period of cover remaining after the balance date and before the next policy anniversary or later date at which any further premium payment is due.

B. Structure and development of the life insurance business

This section is intended to enable the reviewer of financial returns to understand the following:

- The structure of an insurer's total life insurance business at the end of the year (or other period) being reviewed
- The progress of the business over that period
- The trends over time of that business.

For this purpose, several ratios are calculated from the data provided in the statutory returns, based on the appropriate premium recorded. The results of the calculations are compared against those for the insurer's previous yearly return and, for some items, against similar calculations for the total industry. In some cases, the review indicates a number of concerns that need to be investigated further, possibly leading the supervisory authority to direct the insurer to take certain actions.

Many factors can affect an insurer's business portfolio and its progress from time to time. These may be due to external influences from changes in economic conditions and from political or social developments. Some particular issues include high inflation causing inadequate cover, unemployment causing cancellation of policies, insurer costs rising too quickly, changes in the taxation rules or rates affecting the insurers or policyholders, legislative changes requiring insurers to strengthen their financial condition, resulting in higher prices or lower profits, and so forth. There also may be indirect influences from changes in other legislation—for example, from social welfare policy that affects retirement incomes or the availability and cost of health services or from anti-discrimination laws that make some products unacceptable for the market.

In addition, the portfolio can be affected by an insurer's policy and strategic decisions arising either as a consequence of those external influences or from its own actions in the expectation of gaining a competitive advantage from its pricing or a new product, its method of distribution, or its investment strategy.

The external influences generally have an industry-wide effect. Nevertheless, various insurers may anticipate different outcomes from them and hence react in different ways—for example, by no longer selling certain contracts or by concentrating new business on specific demographic groups. The reviewer, when interpreting the results of the calculations, needs to be aware of the significant changes in the external conditions that are anticipated to have an effect across the industry as a whole.

As noted in the introduction, it is necessary to undertake separate analysis for the different classes of life insurance business, taking into consideration essential differences in the characteristics of the products. Not all classes are necessarily available in a jurisdiction nor will every insurer write all of those that are available. The mix of business actually written can vary widely among the different insurers, and, because the financial requirements of the classes are different, separate analysis by class is essential.

Generally, the different products written in a particular class will have similar characteristics; in some cases, where there is a large volume of a specific product, the reviewer may analyze that business separately because of its impact on the total company results. Such analysis may be different in scope.

As stated earlier, the analysis is based mainly on premium income. The premium recorded in the statutory financial statements is normally used, but for some items it may be appropriate to use the premium recorded in the statistical returns for the same balance date. For limited purposes—for example, calculations involving single premiums—it may be useful to consider a single premium as though it were equivalent to an amount spread over the expected average life of the contract—for example, dividing by 10.

The statements are prepared and presented in accordance with local accounting standards, which vary significantly across different jurisdictions. The review and analysis reflect the consequences of the particular accounting convention and standard in place so that comparisons across jurisdictions may not be possible. Insurance accounting is discussed in module ICP 12A and receives only brief comment here. Nevertheless, the importance of the accounting and auditing standards in the jurisdiction cannot be overstated. It is essential for the reviewer to understand the accounting principles and practices for the different classes of business. This module does not refer specifically to the International Financial Reporting Standards (IFRS).

Also, any notes included in the accounts can vary significantly across jurisdictions. Comprehensive notes showing the sources of the various components of the items in the balance sheet and profit and loss statements are very useful for the analysis.

Understanding an insurer's business profile

Various elements of insurance business must be taken into account in the review: the mix of different classes of business, net business in force, new business, and lapses in business. This section deals with each in turn.

THE BUSINESS MIX

The mix of the business by class at the balance date is assessed by calculating, as a percentage, the proportion of the life premium of each class in the total life premium of the insurer over all classes.

The ratio is obtained by expressing the total premium of a class (P_n) as a percentage of the insurance fund's total premium (P):

$$\text{The ratio} = 100 \{P_n / P\} \%$$

Some minor changes in the proportions from those for the previous year are inevitable, but any significant change should be considered and an explanation sought. The cause may be external influences or deliberate management actions and not be of any concern. Significant changes in the business mix, or trends over successive years, should be investigated further, as the reason may indicate a lack of operational controls or other matters of concern to the supervisory authority.

Over several successive years, such variations indicate whether there is a definite trend by the company to concentrate on new types of products. The business mix of a particular company at the balance date will differ from that of other companies as a result of different decisions on matters such as capital available for development, desired customer profile, pricing, and preferred methods of distribution and may be influenced by whether it is a stand-alone entity or is associated with other companies in an insurance group or financial conglomerate. Comparing changes in an insurer's mix over time with those of other insurers, especially those of comparable size, may indicate whether the insurer being reviewed has changed its business operations.

NET BUSINESS IN FORCE

The net (of reinsurance) business in force at the end of the accounting period, taken as one year, arises from the business in force at the start of that year plus net new business during the year less all terminations of contracts from lapses and policy surrenders, maturities, death claims, and adjustments such as policy conversions. Some claim payments do not result in termination of the contract. For example, under a disability policy, regular payments may be made for a period while the disability continues, but the contract remains in force until all the contractual obligations have been satisfied. All termination items should be in the accounts either on the major statements or in the attached notes, but some may have to be obtained from the statistical premiums recorded for the year.

The rate of growth of business in force for each business class and for all life insurance business is of interest. The same calculation may be worthwhile for any products that constitute a substantial proportion of the insurer's business. The results for the insurer when compared with those for the industry or for other directly competing companies should show which companies are gaining, which are standing still, or which are losing market share; when related to other calculations for expenses or financial condition, for example, they may indicate that a company is getting into difficulties. The total growth rate should be the determining factor, since some insurers may decide to concentrate on specific business classes and allow others to decline, with different relative positions compared with the industry.

The progress of the business in force at the end of each year is a major contributor to an insurer's long-term profitability and may reveal the insurer's attitude toward its customers. An excessive rate of growth could indicate problems ahead from inadequate

capital to support that growth, inadequate documentation of policies or administration of new business, or inadequate internal controls over marketing and expenses.

Alternatively, low growth may result from an uncompetitive pricing policy or poor service and lead to declining profitability and the exit of shareholders from the industry, producing a poor outcome for policyholders.

NEW BUSINESS

The production of new business is obviously very important for the insurer. Without a sufficient volume of new business, a company cannot grow, but it is still responsible for paying claims and expenses on all existing business in force. Eventually, total outgo may exceed income from renewal premiums on the existing business plus income from investments, leading to the sale of assets and possibly to insolvency. Although net growth is not necessarily essential for profitability—at least for a while, if the insurer has sufficient technical provisions—the insurer will eventually need to downsize in order to remain profitable. The growth in new business income should exceed the rate of inflation. To ensure adequate profitability to compensate shareholders for the inherent risks incurred by insurance companies, net growth of new business has to exceed the rate of inflation by a sufficient margin. The particular margin is usually determined by the company's overall strategy.

For this purpose, net new business is determined after reinsurance cessions and terminations from lapses. Usually, lapses are differentiated from surrenders and maturities and relate to terminations of the contract at early durations in force. Reinsurance is discussed in section C.

The interaction of gross new business and lapses is extremely important. Poor-quality new business resulting in high lapse rates, as discussed below, has a negative effect on the expense rates and on the company's financial condition as well as on forfeiting policyholders.

The contribution of business to the growth rate is calculated for each class of business using the recorded premium. It is also calculated for the insurer's total business by using the adjusted proxy premium in lieu of the single premium.

An examination of growth rates by class over successive periods shows whether the company has a continuing interest in that class of business. Coupled with an examination of the other operating functions of the company for that class, it may indicate a cause for concern regarding the continuing treatment of the relevant policyholders. When existing products cease to be sold as new business in favor of other business classes, there is a tendency for the insurer's administration of the discontinued product and treatment of the policyholders to deteriorate, resulting in high lapse and surrender rates and lower profitability.

The ratio can be calculated gross or net of reinsurance from the ratio of the premium (P) of the financial year under review to the premium for the preceding year:

$$\frac{100 \{(P_i - P_o)\} \%}{\{P_o\}}$$

where P_i = the premium in year i , and P_o = the premium in year $i - 1$.

LAPSES

A policy lapses when it is forfeited by the policyholder without receiving any payment from the insurer in respect of the premiums already paid to the company. Lapses allow an insurer to be at least partly reimbursed for the expenses, including commission, it incurred in acquiring the policy, establishing records, and providing risk cover for the period the policy was in force. It is different from a policy surrender, which the company treats as a claim by the policyholder for which it pays the surrender value.

The permanent insurance class, which is the dominant business in some jurisdictions, incurs lapses from new business for an initial period, usually two or three years. Temporary insurance products do not normally have a surrender value and are treated as lapses on voluntary termination. Investment account, investment-linked, and fixed-term annuity classes may provide an immediate surrender value on early termination of the contract, and lapses are not a consideration. Lifetime annuities do not allow for early termination in normal circumstances; if this is allowed, often described as a commutation of future payments, it is likely that the policyholders taking advantage are those who expect to die sooner than the average, leading to an increase in the average lifetime of the remaining annuitants, a reduction in profitability, and the possible need for more capital.

Although there may be unavoidable reasons for lapses in some cases, a lapse usually means poor-quality new business was written, which should have been avoided or minimized at the outset. Poor quality may be due to inadequate attention to underwriting—for example, when the details on the application form are not adequately assessed or the product applied for was not recognized as an unsuitable policy for the particular applicant. It might also result from the sales process—for example, when the management or agents have a general attitude that “the more new business written, the more will continue in force.” A high lapse rate is a concern for the company because it results in lower profits, for the industry because it creates a negative public attitude regarding insurance and the integrity of insurers, and for the supervisor because it indicates a lack of proper internal controls on the operations of the insurer.

The maximum period before a surrender value becomes payable for the permanent insurance classes may be specified by legislation, or it may be included as a condition in the policy contract, where competition and market discipline will normally standardize it at two or three years. It is normally assumed that a policy lapse will occur earlier rather than later in this period; otherwise a policyholder may elect to continue premiums until a surrender value can be claimed. For the purpose of calculating lapse rates for

the financial accounting period, generally standardized at one year, it is convenient to assume that they occur in the first policy year. It is also convenient to assume that new business is spread evenly over the year. Hence, the lapses in the accounting year arise from the new business in both the current year and the previous year; the denominator of the ratio is assumed to be the average of the gross new business for the two years.

$$\frac{100 \{L\} \%}{\{0.5(N_i + N_o)\}},$$

where L is the total premium lapsed in the year, and N_i and N_o are the gross new premium for year i and year $i - 1$, respectively.

Some insurers undertake considerable internal analysis of the lapses. Such analysis may be based on the frequency or method of premium payments, on the policy-year duration before the lapse occurs, or on source of the business or some other factor that local experience suggests. It can be worthwhile for the insurer. It may indicate that accepting premiums, say, quarterly leads to very high lapse rates, that payments by cash or check have higher lapse rates than payments made by some automatic method of deduction, or that business from some agents is not acceptable. As a result, the insurer can amend its operational requirements and increase its net business growth and profitability. The supervisory authority cannot undertake this type of analysis. However, insurers with significantly higher lapse rates than typical in the jurisdiction should be queried. Investigating the lapses as noted and reporting results to the supervisor could be useful for the insurers and the supervisor and ultimately benefit policyholders by reducing their losses.

If the normal period during which most lapses occur in a jurisdiction is the first three policy years, calculating an overall ratio for the accounting year is unlikely to be useful if it ignores how much business is in the second and third policy years. The lapses in the accounting year can relate to business written over four policy years, but the fourth year can be ignored for purposes of the ratio. For a consistent across-the-board ratio, the same general assumptions as for the above formula—that is, new business is spread evenly and lapses are higher for the earlier durations in force—need to be made. The relative weights given to the other years must be assumed. For example, if 70 percent, 20 percent, and 10 percent of the lapses have occurred in the first, second, and third policy years, respectively, the formula would be

$$\text{Lapse ratio} = 100 L / (0.35P_i + 0.45P(i - 1) + 0.20P(i - 2)) \%,$$

where $P(i - 2)$ is the gross new premium in year $i - 2$.

In practice, the factors need to be based on local knowledge and experience.

Exercises

- 5. What influences affecting the products and volume of business written by the industry have been evident over the last five years, and what expectation do you have for such influences over the next five years?**
- 6. Why is it necessary to calculate ratios for different classes of business as well as the total?**
- 7. Why is it necessary to use premium as the basis for calculating ratios?**
- 8. What will you do if there is a significant change in the business mix from last year?**
- 9. What might cause an insurer to write a large volume of new business but have slow growth or a decline in business in force?**

C. Reinsurance

A primary life insurer may reinsure part of its business for various reasons. The principal purpose is to manage its insurance risk so that it maintains its financial capacity to meet its commitments to policyholders, complies with the solvency requirement, and maintains sufficient capital to continue as a going concern. It may wish to limit its retained risk from certain business—for example, where some policies are for very large amounts insured or where the insurance risk is unacceptable, either in whole or in part, because of an increased mortality or other risk. Claims from such risks may adversely affect profitability. Other purposes could be to increase gross market share, to achieve marketing advantages, or possibly to gain access to a reinsurer's skills for advice on underwriting, pricing, new product development, or other technical issues.

The primary life insurer writes business directly with the public and at all times remains responsible to the policyholders for settlement in full of all valid claims made under the policies. The reinsurance contract is wholly between the insurer and the reinsurer, which has no contact with the policyholder at any stage. If the reinsurer fails to honor that contract, the insurer has to meet the cost of the full gross claim. It is therefore vital that the insurer understand the financial capacity of the reinsurer to meet its commitments at all times.

The insurer retains the risks it accepted from its policyholders less the risks it reinsured and expects the reinsurer to meet the appropriate portion of a claim. Although the insurer will usually record its financial results and maintain a level of financial resources based on its net retained risks, the required solvency margin and capital need to be established after assessing the creditworthiness of the reinsurer, as discussed in later sections.

Reinsurance is important for primary life insurers, although it is not as dominant a factor in their operations as it is for non-life insurers. For example, very large life insurers with significant capital resources may have little need for reinsurance and can retain a very high proportion of their gross business. Even so, such companies protect their portfolios from events such as a catastrophic accident or major epidemic in which a large number of lives they insure could die. Every primary insurer should have a reinsurance strategy and a program that will enable it to write gross business in accordance with its available capital and to maintain the net portfolio of retained risk consistent with its desired performance criteria.

For similar reasons, a reinsurer may also reinsure or retrocede some of the business it has accepted, and its internal processes and supervision should be the same way as for primary insurers.

Although there are many types of reinsurance contracts, only a few tend to be used for life reinsurance in most jurisdictions. This module does not generally discuss the various types of reinsurance available or, except in general terms, the operational processes for establishing and controlling the outcomes of a suitable program. It is outside the scope of this module to describe these contracts; for relevant information, refer to

IAIS (2002c) on the evaluation of the reinsurance cover of primary insurers and the security of their reinsurers. This short standard of six pages is a useful reference tool.

A module on reinsurance is included for ICP 19, and this too is a useful source of information.

Supervisors should understand how the reinsurance contracts used by the insurer provide cover and how they are accounted for.

Jurisdictions vary as to their policy regarding the total level of risk retained by insurers. Often there is no legislative requirement on this matter, and insurers set their own retention level as they wish. In all cases, the supervisory authority should receive full information about each insurer's program, including details of the reinsurers used and the types and volumes of reinsurance involved.

In many jurisdictions, the administration of life reinsurance agreements by the primary insurers and sometimes by the reinsurers ranges from weak to poor. Unless there is strong emphasis on supervision of reinsurance programs, there could be negligible or poor documentation and administration of the contract between the parties, resulting in later disagreement concerning the data provided by the insurer or rejection of claims by the reinsurer, with an adverse financial impact on the insurer. Moreover, the position of the reinsurer also needs to be protected by the satisfactory administration of agreements.

Since the primary purpose of reinsurance is to manage retained liability risk, a reinsurance program covers permanent and temporary insurance classes. It normally does not have a place in the management and administration of investment business where the claim amount is the accumulated value of the contract at the time of the claim. Where a policyholder simultaneously purchases term insurance and an investment contract, the term cover should be included in the insurance class. Unless these are written as separate contracts, the record keeping and administration are complex for the insurer. While life insurers may be able to reinsure exposure to any guaranteed minimum benefits under unit-linked contracts, it is unusual to do so; it is more appropriate to establish a minimum return on a conservative basis.

A contract of reinsurance in which there is no transfer of insurance risk is known as financial reinsurance. These agreements are used to provide finance to the primary insurer, mostly for the purpose of improving the published financial statements. They can be useful to insurers in some circumstances. Sometimes, however, they are obscure and provide scope for deliberate manipulation of the accounting figures in the statements. It is important that financial reinsurance agreements, if they are permitted at all, be reported to the supervisory authority and be examined for the accounting consequences and their real purpose. Such contracts are not considered in this module.

ART, alternative risk transfer, is provided by the capital markets. It is little used by life insurers and is not discussed here.

If an insurer reinsures a high proportion of a significant product or class of its business, the reason should be investigated and the implications assessed. For example, the

supervisor should examine whether the insurer has the capacity to meet its commitments to its policyholders if the reinsurer becomes insolvent.

Relevant ratios

The financial statements are best analyzed separately for each business class. Ratios may be for the proportion of business reinsured, the proportion retained (the net retention rate), or both. The preferred option is the net retention ratio, given its importance in determining the financial health of the life insurer. The calculations are simple in either case.

PROPORTION REINSURED

The proportion reinsured is:

$$\frac{100 R\%}{P},$$

where R = the total premium paid to reinsurers for the class of business during the year, and P = the total gross premium received by the insurer for the class during the year.

The accounts may describe the reinsurance premiums paid as outward reinsurance expense, with the difference ($P - R$) referred to as net insurance premium; other descriptions are also used.

An insurer's ratios will change from year to year. The insurer is fundamentally concerned with ensuring that the reinsurance program allows its net retained business to comply with its profitability performance criteria and to satisfy the solvency and capital adequacy requirements. The supervisor is not normally concerned with the proportion reinsured, provided that other aspects of the net retained business do not cause concern.

Some supervisors are, however, concerned when a life insurer reinsures most or all of a class or major product of insurance business to a life reinsurer. An insurer in these circumstances may take the view that it bears no responsibility with regard to the business and not be concerned about underwriting processes, its own general administration of that business, and particularly the handling of claims. While this would be short-sighted, it seems likely that the insurer will pay less attention to detail and have fewer internal controls. The supervisor may wish to seek an explanation as to the circumstances and reasons.

In some circumstances, reinsuring 100 percent of business subject to particular underwriting risks is a sensible precaution. For example, where the increased mortality risk of applicants is assessed at, say, three times normal for a given gender and age

or where the persons are working in a high-risk occupation, reinsuring 100 percent of business to a specialist reinsurer would be normal.

It is also important for the reinsurer to have confidence that the contract is being administered properly.

NET RETENTION RATE

The net retention rate is:

$$\frac{100 NP\%}{GP},$$

where NP = the net retained premium, and GP = the gross premium for the year.

In addition to IAIS (2002c), other useful documents are IAIS (2002b, 2003). Both papers are relatively short—nine and eight pages, respectively—and cover both life and non-life insurance. They also describe general supervisory and technical issues important for a general understanding of reinsurance.

Exercises

- 10. Why is a reinsurance program necessary for a life insurer?**
- 11. How might the insurer's financial strength affect the reinsurance program?**
- 12. What would you do if a proposed reinsurance contract is very complex?**
- 13. What actions might be appropriate if the reinsurer is unable or unwilling to meet claims?**

D. Profitability

This section comments broadly on how profit is determined for a life insurer and discusses how this may be analyzed.

The first matter to note is that the actual figure shown as “profit” in the financial statements depends on the accounting and actuarial principles and standards applying in the jurisdiction.

The balance sheet value for total liabilities consists of technical provisions (policy liabilities) calculated by the actuary plus other liabilities calculated by the accountant. The assets may be shown at market value (fair value) or at book value determined in various ways (cost, adjusted cost, amortized cost). For technical provisions, the actuary adopts one of the basic approaches, using either a net premium method or a realistic method (see section E).

In any case, both assets and policy liabilities should be determined on a consistent basis. One approach is to use market value of assets and realistic value of liabilities: this approach is aimed at determining a fair value for both assets and liabilities. An alternative is to use “book” value for assets and a net premium basis for policy liabilities: this essentially arbitrary and conservative approach, which has long been applied for the traditional business classes, generally requires less actuarial judgment from the actuary in the technical valuation process as compared to a fair value (realistic) approach. It is, however, a much less transparent method, and interpreting the results to understand the implications of the insurer’s current and potential future financial condition is a complex process.

A life insurer’s financial statements rarely use the term profit. Usual descriptions include surplus, operating surplus, operating profit, and realistic profit. Surplus is usually associated with the net premium result, and profit is associated with a reality-based method, but this is not automatic. The terminology and presentation of profit or surplus in financial statements vary widely by jurisdiction. For example, in North America, financial statements use “capital and surplus” as the balance date term for the excess of the insurer’s assets over its liabilities and may refer to the increase in this balance sheet item as the “annual operating surplus” for the year.

The actual profit achieved from a life policy can be calculated only when the contract is no longer in force. At any time, a life insurer’s business will consist of various types of policy contracts, with different risks, different periods in force, and different terms to run, at different prices, subject to different policy conditions and to varying economic conditions while in force. Accordingly, the “profit” declared by the insurer for a year is, in reality, only an estimate of the contribution made that year to the ultimate profit or loss.

The gross operating profit or loss available from the income statement is derived from the total net insurance premium (P) plus the investment revenue (I) less outgo from net claims paid (C) and expenses of administration (E), together with the change

in the technical provisions (V). Appropriate adjustments for extraordinary items, where allowed, are also made.

This may be expressed in broad terms as:

$$\text{Gross profit} = P + I - C - E - V.$$

Gross profit is normally the base for calculating taxes, so net profit is obtained as gross profit less taxes (T):

$$\text{Net profit} = P + I - C - E - V - T.$$

These calculations are derived from the financial statements, with profit based on the income and outgo items. For actuarial purposes, it is useful to show how that profit figure is obtained from planned or expected profits and from experienced or actual profits and losses.

The profitability depends greatly on the outcome of the actual experience from claims, investments, and expenses. Each is significant for the insurer overall, but the relative significance of the items varies according to the particular business class. For temporary insurance products, the claims experience is dominant, and the investment experience is minor; for permanent insurance products, both the claims and the investment experience are highly relevant, especially where policies participate in the profits. For the investment classes, the investment yield is the essential item. In all cases, the expense experience is a relevant factor to a greater or lesser degree.

Operational risks

Losses arising from operational risk, including in the investment classes, can pose major risks and usually are accounted for separately. These risks range widely, including legal and business issues, such as business continuation in the event of a catastrophe and outsourcing of various functions to third parties. They are difficult to deal with, and they can occur in relation to an insurer's liabilities, assets, or both. Many operational risks arise from a lack of proper internal controls or poor implementation and oversight. Such risks are not susceptible to standard financial analysis.

Operational risks are considered in other modules and in IAIS documents. No further consideration is given here, except to note that the supervisor should verify that the insurer has taken steps to control these risks to the extent possible.

Actuarial approach to profit analysis

For the regular financial analysis, the actual experience is compared with expected experience for the sources of profit.

The actuary determines the expected experience, which is a direct function of the assumptions made. The statutory rules in place may prescribe the principles on which those assumptions must be made—for example, they may relate to decisions made for pricing at the outset of a contract or those used to value the technical provisions each year, which may depend on the prevailing market rates, possibly within a permitted range. The actuary may prepare a financial condition report (see section H), which details the assumptions made and how they were determined, the calculated expected claims, and the actual claims of the insurance risks. The report also discusses the outcome and its effect on the year's profit result. Where such a report is not available, the supervisor should seek information on the comments and advice that the actuary has given to the life insurer. A suitable report should be available for supervisory consideration.

If a financial condition report is not required, the supervisor should ask the insurer to compare the actual to the expected experience in the year under review and to explain any significant difference. In many jurisdictions, the supervisory authority has the statutory power to seek any information it needs in order to be satisfied with the insurer's statements and financial condition. This power should be used when circumstances warrant.

If there has been a significant variation from the previous values of expected or actual claims, the actuary should comment on the reasons. Similarly, the reasons for variations in the ratios of actual to expected death claims and sickness claims should be examined; the actuary should discuss the results, indicating whether they represent a permanent or a temporary improvement or deterioration in mortality or morbidity. The insurer should act accordingly, perhaps by reducing or increasing premium rates or tightening underwriting or claims procedures.

The supervisor should be able to form an opinion as to whether the result is significant regarding the future outlook of the company.

There are many technical aspects to this process that are outside the scope of this module.

Profitability analysis must be done by business class and often by individual product lines. The wide differences in the experience among certain products make this imperative if the insurer is to identify and rectify problem areas. For example, in life insurance, the mortality rate for compulsory consumer credit cover is generally much lower and the expense rate much higher, as a percentage of premium, than the rates for other products; any substantial variation in the proportion of low-mortality business could affect the result for the class and lead to inappropriate decisions.

As noted, the analysis is normally done by the actuary and recorded in the financial condition report. The data needed are not given in sufficient detail in the financial

returns, and the actuary must have access to full data for the purpose. The supervisor should study the experience data and conclusions given in the financial condition report. Some profitability analysis from the statutory statistical returns may be possible but is unlikely to be comprehensive.

Supervisory analysis of declared profit

The supervisor should, however, do a more straightforward analysis from the financial returns. The following approach to analyzing the operating profit declared for the year is appropriate. The results of the calculations will differ from the actuary's analysis due to differences in the source and presentation of information and in the methodology used. Nevertheless, the supervisor's conclusions regarding the insurer's experience should not be contrary to those of the insurer.

CLAIMS RATIO

The claims ratio is taken as the ratio of the gross claims to gross premiums—that is,

$$\text{The claims ratio} = \frac{100 \{C\}\%}{\{P\}},$$

where C is the total claims, and P is the total premium.

The calculation can be made for the gross or net business. The net claims are the gross claims less the recoveries from reinsurers.

The main pages of the financial statement often show only “claims paid” as a combined figure of all amounts paid on termination of policies, whether from death, sickness, maturity, surrender, or other change in the contract, plus annuity payments.

However, the notes included in the statements may provide further information showing death claims and disability or sickness claims separately, with maturities, surrenders, and other causes perhaps as a combined amount. There would be little value in analyzing maturity ratios since they are determined at the start of the year. Separate analysis, using the above formula, of mortality, morbidity and, where available, surrender ratios is useful. It is more likely this could be done from the statistical returns than from the financial returns. Conducting a separate analysis may prompt the supervisor to request further information.

The company ratio for the total business is a major factor in the profit for the year. The contribution by class or product of the business is important, and any trend for those classes over several years can influence the insurer's future performance. There may be quite large differences in the ratio over successive years as a result of factors such as a significant volume of maturities or high surrender rates for reasons outside

the insurer's control—for example, changes in the tax rate to which policyholders are subject.

EXPENSE RATIO

If E is the expense in the financial year and P is the corresponding net premium,

$$\text{The expense ratio} = \frac{100 \{E\}\%}{\{P\}}$$

Care needs to be taken to understand what expenses are included in the financial statements. The accounting rules may treat certain costs as special or extraordinary and treat them specially—for example, as an adjustment to the reserves.

The expenses in the accounts relate to the net business after reinsurance. Strictly, the reinsurance recoveries include reinsurance commission, which is the contribution to the insurer's commission expenses for the business passed to the reinsurer. The expenses included in the ratio calculation should be reduced by that amount where it is available, which is not always the case.

The expense ratio obviously has an important effect on profitability of the insurer, the class, and the product. Expenses for each insurance fund and by class should be available for analysis; only an approximate amount may be available for specific products, since many expense items must be apportioned to arrive at the attributed amount.

The trend over recent years for the company and its business classes should be noted. This can be compared with corresponding industry-wide ratios, although there may be valid reasons for differences.

Where the law requires a financial condition report to be prepared, the actuary should comment on the actual expenditure incurred in the year in relation to the total expense allowances in the premiums received. This requires an actuarial calculation based on assumptions made in the pricing or the valuation of liabilities. The difference between expense allowances and actual expenses is the contribution of expenses to profit (or, if negative, toward a reduction in profit).

Some insurers—for example, in Australia—analyze expenses, including commissions, extensively, separating expenses by new business, renewal, claims administration, and investment costs. If such analysis is required, the results may be included in one of the notes to the financial statements. It is more likely that the information for a detailed analysis of this type is in the statistical returns. Dividing expenses incurred between the acquisition of new business and maintenance is useful for pricing and valuation purposes.

The insurer is then able to make decisions about operational matters with a view to rectifying any serious deficiency. It may set a tighter budget for expenditure in the following years, improve internal administration, review its marketing, or undertake other

changes. The supervisor should note the actuary's comments in the financial condition report and, if appropriate, seek further information from the insurer on the proposed actions to be taken.

INVESTMENT REVENUE

$$\text{The investment revenue ratio} = \frac{100 \{I\}\%}{\{P\}},$$

where I is the investment revenue and P is the total net premium.

The value of I is the investment income from interest, dividends, and rents plus profits on the sale of assets; it may include the unrealized profit and loss on current assets or a proportion thereof.

Investment income depends on current market rates, which vary across jurisdictions and change along with economic conditions. The proportionate contribution to gross profit is part of the actuarial analysis and apportioned between retained earnings (often taken as the excess assets over policy liabilities in the fund) and technical provisions. If a realistic method of liability valuation is adopted, this analysis often results in a low investment profit, since the actual investment yield on the assets backing the technical provisions is likely to be close to the valuation assumption.

It is useful to examine the trend by class as well as for the combined business, where the separate values for the investment income are available.

A more appropriate approach is to base calculations on assets rather than premiums. For this purpose, it is assumed that investment income is earned evenly during the year on average assets. While this may not be strictly correct, the formula reflects a sufficiently good result to be useful.

$$\text{The ratio} = \frac{I}{0.5 (A_o + A_i - I)},$$

where I is the investment revenue for the year and A_o and A_i are the assets at the start and end of the year, respectively.

If desired, ratios for investment income, realized profits on sale, and unrealized gains can be calculated separately.

The actuary assesses investment revenue by considering the investment yield in relation to the asset portfolio. This is more useful for pricing and valuation purposes. Again, the financial condition report should be examined, as the actuary's comments may indicate concerns with the insurer's investment policy. This is discussed in more detail in section F.

The supervisor has direct access to market information on investment rates and may be able to make approximate calculations of expected investment income for the

various asset classifications in the balance sheet and be in a position to broadly confirm the recorded investment revenue. Alternatively, the supervisor may request more detailed information from the insurer in order to be satisfied.

CHANGE IN TECHNICAL PROVISIONS

The change in the technical provisions—present value of policy liabilities (V)—is denoted by $V = (V_i - V_o)$, where V_i and V_o are, respectively, the value of policy liabilities at the end and start of the year under review. It is referred to in the formulas on gross and net profit. Separate analysis of this item is desirable because it may have a significant impact on profit.

For example, where a life insurer has a rapid and significant increase in new business and net business in force, the growth in the value of V may lead to less profit being recorded in the financial statements.

PROFIT ANALYSIS

The proportionate contribution of each of the items discussed above can be readily calculated as the individual item divided by the net profit. The calculation based on gross profit can also be examined, if desired.

The analysis and any recommendations by the actuary in the financial condition report are likely to be important to the insurer's business planning. The usefulness of the analysis depends on the method of valuing liabilities. A reality-based valuation is easier to interpret than a net premium-based valuation. In either case, a detailed explanation is outside the scope of this module.

The following is a simplified example of the presentation of the analysis of profit of an insurer for the year, which presents hypothetical amounts:

Investment income on retained earnings	12
Planned profits (profit margin release)	3
Experienced profits	5
Mortality/morbidity	4
Expenses	(1)
Investment	1
Adjustments	1
Gross profit	20
Tax	(6)
Net profit	14

The adjustments, including any residual untraceable amount, may vary widely but are seldom of major significance. If they are large, they should be explained and, if appropriate, categorized with one or more of the other items.

For further information on analysis of earnings, see Canadian Institute of Actuaries (2004).

For the supervisor, the results of any analysis may show whether the insurer has set out to improve results by taking short-term actions that could have adverse consequences in the future. Examples may be attempts to improve investment earnings by making risky and volatile investments, minimizing expenses below essential requirements with insufficient ability to cope with general administrative procedures, weakening the oversight of internal controls, and using innovative accounting methods.

Exercises

- 14. What does profit or surplus as used for the accounts in your jurisdiction represent for a life insurer?**
- 15. Are the standards for preparing the insurers' financial statements based on a consistent approach for valuing assets and liabilities in your jurisdiction?**
- 16. Actual experience for claims is in the accounts. Where would you find the expected experience?**
- 17. What would be a reasonable explanation for an increase in mortality rates in the insurance business classes?**
- 18. In your jurisdiction, are there ratios for which sufficient information is not available, and what extra information would you need to be able to make the calculation?**

E. Technical provisions

This section considers a life insurer's policy liabilities or technical provisions under its contracts with policyholders.² The liability in respect of a policy depends on the type of policy, amount insured, age and gender of the policyholder, duration of the policy, and the valuation process regarding several other factors, including the methodology adopted and the many assumptions made. The valuation of all policy liabilities existing at the balance date and at any other time is a task for an expert. Accordingly, it should be undertaken by a fully qualified actuary, and many jurisdictions include a legislative requirement for this.

Life insurance is a complex long-term business involving promises to pay at some indeterminate future date if the contingent event provided for in the contract occurs. The policies at the latest balance date have been in force for varying periods, have been written at different dates in the past on terms and conditions applicable at that time but in many cases not applicable for new business written now, and are for varying amounts and risks not necessarily compatible with other policies.

This module does not discuss the valuation process in detail, but it is important for the supervisor to have a broad understanding of what is involved. The amount of technical provisions appearing in the balance sheet is calculated for each insurance fund and for the company. There have been significant developments in actuarial methodology, technology, and accounting principles in recent decades, and it is now feasible to value each policy separately and sum over all policies for each product.

Whatever valuation method is adopted, which in any case may largely depend on the legislative requirements, the policy liability is calculated as a present value of the future outgo to meet claims and expenses less future income from premiums and investment earnings. This is described as a projection method.

The valuation data are obtained from the specific business statistics files, which provide the necessary information for such items as sum insured, annual premium, and the potential claim amount separately for each type of claim. Since the data are an important input to the calculations, they are checked in detail and tested and verified by the actuary and the auditor to ensure that they provide a reliable basis for the financial statements. The reports should indicate that this has been done.

These experts may recommend to the insurer that the system be changed to improve the accuracy and timeliness of the data. In such circumstances, their reports for the following year should be reviewed to confirm that appropriate action has been taken.

The methodology will either be based directly on the gross annual premium (often described as a realistic method) or use a calculated net premium to allow for the cost of the particular insurance risk, expenses, and investment income (a net premium method). In either case, an explicit provision for adverse deviations from the expected future experience may or may not be included.

2. The terms technical provisions and policy liabilities are used interchangeably in this module.

As noted in an earlier section, many jurisdictions use a net premium–based method. It is a well-established method for traditional business in which the timing and amounts of premium payment are fixed. It requires the use of an artificial premium based on appropriate parameters for mortality and morbidity, interest rate, and acquisition expense. These are generally specified in the legislation, either with specified values or with stated requirements for determining how the values are to be derived. The method is, or should be, inherently conservative. Although it has been generally successful in protecting the prudential aspects of policyholder interests, the results are difficult to interpret, and the market conduct requirements for transparency are hard to fulfill.

The alternative realistic method based on the premium actually received is a relatively recent development over about the last 20 years. This approach allows different valuation procedures for different business classes. The method requires considerably more judgment by the actuary, but its results can be presented in a meaningful manner, which improves general understanding.

Assumptions have to be made by the actuary for each of the factors affecting the technical provisions—that is, for each insurance risk, the discount rate, expenses, and any special guarantees, such as future insurability and guaranteed annuity options.

These assumptions are made after extensive examination of the actual experience over the period and anticipated trends and need to be specific to the risk of the product. For example, the risk under an immediate lifetime annuity is that the annuitant will live too long—that is, the mortality rate will decline—whereas for life insurance, the risk is that the mortality rate will rise and claims will occur earlier than anticipated.

If deemed appropriate, the previous assumptions will be modified for the current valuation.

It is usual to value the gross business and the reinsured business, with the difference being the net liability. Alternatively, the gross business and the net business can be valued, and the difference is the value to the primary insurer of the reinsured business.

Other methods may be adopted for certain classes of business or types of product due to the nature of the contract, the available data, and the ease of calculation. The actuary should test the resulting values for general consistency with the result from a projection method, had it been adopted.

The projection method may not always be used for temporary insurance products, which frequently have negligible policy liability value when calculated by projection. A simpler, more straightforward approach is generally adopted using estimates for the value of outstanding claims, incurred but not reported (IBNR) claims, reported but not yet admitted (RBNA) claims, plus an unearned premium provision (UPP) for the remaining risk in respect of the period from the balance date to the next policy anniversary for policies still in force. This approach for IBNR and RBNA, also designated in some jurisdictions by other abbreviations such as ICOS (in course of settlement), is adopted to establish claims provisions for other business as well. The UPP is often estimated by time apportionment methods, usually based on the months of policy anniversaries requiring 1/24th factors on the assumption that the policies will be spread

evenly in the month. A final component may be included for unamortized acquisition costs. The estimate for IBNR, where this alternative method of valuation is adopted, recognizes that some claims that will be made in relation to the accounting year have not yet been advised to the insurer. A study is made of the dates that the claims are reported compared with the dates of the events leading to those claims, and the delay is estimated. Estimates for the different types of policy are used because of significant differences in the delay between death and sickness claims.

The RBNA estimate is necessary to allow for those claims received by the insurer but not yet processed through the claims administration system.

Generally, the classes of investment business purchased with a single premium are not readily valued by projection, and a different approach, the accumulation method, is used. At the balance date, the technical provision is the account balance—that is, the accumulated value of the policy at that date, sometimes less the appropriate amount for any acquisition cost not yet amortized.

The technical provision recorded in the financial statements has significant influence on reported solvency, declared profits, and their distribution for the period and for the company's future profitability and financial condition. The supervisory review should include a close examination of the financial statements and, where available, the actuary's financial condition report for the period and the previous year. Several of the notes to the accounts are important for this review. If there is neither a financial condition report nor an actuarial report, it is difficult for the supervisor to determine the reliability of the amount provided. Direct comment from the actuary should be sought.

It is assumed here that the statement notes are comprehensive in order for both investors in the insurer and policyholders as customers to have appropriate information.

The first of these notes is the summary of significant actuarial methods and assumptions. This is similar in concept to the summary of accounting principles. Insurers may be inclined to minimize the information given, so it is important for supervisory or other rules to indicate the minimum detail required. The note should comment on the relevant items—that is, the investment earnings, expenses, inflation assumed, and rates of mortality, morbidity, surrender, and lapses. For each item, it should provide the assumptions used in the valuation for the current year and for the previous year. These will show whether there have been changes in the latest valuation, which can be examined for reasonableness, by comparing them with economic movements for items such as inflation or by reviewing whether similar changes have been made by other companies for, say, morbidity rates.

There may be a note on taxation, including changes in rates and the resulting effect on the tax assumption.

A further note may provide information on the policy liabilities by fund and business class that make up the balance sheet total. The movement over the year is given as a check on the corresponding profit and loss statement.

Other notes may indicate the effect of the calculated technical provisions on solvency, profits, the distributed amounts, and any amounts held in the insurance fund

that are not currently available for distribution. Other sections of the module comment on these matters.

The statistical returns should provide additional information for the supervisor's consideration, especially in situations where there is no separate actuarial report.

The financial condition report provides extensive information on policy liabilities and, as such, is very useful. Details of methods and assumptions are supplemented by results for products in addition to various aggregates. Included is information not generally available on the actuary's investigations for the IBNR and RBNA components of the liability. There is also the derivation of items, such as deferred acquisition allowances, that can be important for the policy liabilities of investment business.

The assumptions should be examined, and the changes noted and compared with those for the previous valuation. Any movement generally is not significant for the insurance risks in any one year. For investment and economic risks, particularly for the assumed inflation rate, a relatively substantial movement is possible; the supervisor is able to consider the reasonableness of any change in the actuarial assumption against the current general economic conditions.

The actual results in successive years of the valuation depend on the interaction of the assumptions, changes in the mix of business, and relative growth of the net business in force.

Little worthwhile financial analysis of technical provisions as a specific item can be made directly from the accounts. It may be of interest to note the increase or decrease in the technical provisions from the previous year for the temporary insurance class and compare it with the movements in premiums and claims—to indicate whether the amount is reasonable—but it is doubtful that it will be of significant value for trend analysis over a longer period. There are so many variations in the different components of an insurer's net business in force—the item valued for the technical provisions—that any analysis should be undertaken directly by an expert actuary using as much information as possible about the actual results. The results can best be noted in their impact on the profitability and solvency, referred to in other sections.

Exercises

- 19. Do returns in your jurisdiction include a financial condition report or similar actuarial report? If so, is it comprehensive?**
- 20. Are sufficient resources available within the authority or externally for a review of the technical provisions?**
- 21. What methods of liability valuation are commonly used (a) in your jurisdiction and (b) elsewhere?**
- 22. What is the process for establishing the necessary assumptions in your jurisdiction? Are any alternatives available internationally?**
- 23. Explain the difference between IBNR and RBNA.**

F. Assets

The policy liabilities that a life insurer writes are the driving force for its operations. The assets held at any time to meet those, and any other, liabilities must be suitable. The investment policy must take account of the interaction between the liabilities and assets and the inherent risks in both. The supervisor should examine the asset portfolio and be satisfied that the investment policy is appropriate.

For a life insurer, the assets held to meet policy liabilities are generally a very high proportion of the balance sheet. It is vital that the nature of those assets be suitable overall to meet the liabilities, which are based on monetary amounts calculated as described in the policy contract or, for investment-linked business, in a contractually specified investment strategy.

It is important that the insurer have a sound ALM (asset liability management) approach that will ensure sufficient diversification among the available asset classes, good asset quality, relevant matching of cash flows of income and outgo, and sufficient liquidity to meet its total liabilities.

A strong ALM process is essential for the life insurer. In addition to the matters of general suitability and credit quality noted above, the assets need to satisfy any liquidity requirements and to match the currency and duration of liabilities to a very substantial extent. Investment experts and actuaries may consider further technical factors for ALM, but supervisors tend to be most concerned specifically with currency and duration.

Inadmissible assets

The supervisor will be most interested in the admissible assets when assessing solvency. Inadmissible assets, also referred to as non-admitted assets in some jurisdictions, for prudential purposes are those recognized for accounting purposes in the balance sheet but deemed uncertain as available for settlement if and when required. The particular list of inadmissible assets varies by jurisdiction; some examples are future income tax benefits, loans to agents, office equipment, premiums due but not paid, and below-investment-grade bonds exceeding a stated proportion of total assets. In several jurisdictions, the regulatory rules may instead specify in detail the assets admitted for valuation and solvency purposes.

While detailed attention is given to the admissible assets, the inadmissible assets as a proportion of the total need to be noted first. The proportion should be low, and if it is high or growing each year, the reason needs to be examined. It could result from an inappropriate or poor implementation of the investment policy, poor office administration, or a lack of internal controls. What constitutes a high proportion is a matter of judgment in the particular jurisdiction, but a percentage exceeding a threshold in the 2–10 percent range typically should be queried.

Diversification

Diversification of investments among categories of assets is a basic principle for life insurers.

The yield on the asset portfolio is an integral component of policy pricing, financial condition, and profitability, and the markets and values for major classes of assets tend to react to different degrees and sometimes move in opposite directions. For business including guaranteed sum insured and other guarantees, concentration of assets in one class may lead to poor outcomes, causing the need for substantial new capital if the company is to continue in business or to avoid insolvency. It also is necessary to have some diversification of risks within most asset classes. It is not usually necessary for the prudential investment rules to restrict concentration to a class such as national sovereign debt. However, it is generally unwise to hold a high proportion of a major class, such as company shares, in a single investment, with the effect that such an investment could represent, say, 10 percent or more of total assets. Share prices can be extremely volatile, and a fall of 50 percent in the value of some share occurs regularly. Imagine what would happen to the profits and even the solvency of an insurer with, say, 15 percent of total assets in a particular share whose value falls 60 percent.

The supervisor should review the mix of asset classes recorded in the balance sheet and seek confirmation from the actuary or the external auditors that they are correctly identified. The mix is readily obtained, for example, from the following:

The ratio = 100 (government securities/total admissible assets) %.

For a number of reasons, such as conflicts of interest, independence of board, management autonomy, and contagion, it is also important to ensure that investment in other companies within an insurance group or conglomerate is limited to a low proportion of admissible assets.

Credit quality

The credit quality of the debt assets—government and corporate bonds, mortgages—is examined to review the likelihood of default by the issuer. The credit ratings given by the major international rating agencies (see section H) indicate the relative creditworthiness of the issuers through several investment grades and non-investment grades. A sound asset portfolio is invested mainly in investment grades for safety, but because the yield generally is higher for lower-grade investments, the asset portfolio usually has a mix. The overall credit risk of that mix of securities is reflected in the investment yield and influences the insurer's pricing and its financial strength.

The quality of direct investment in property mortgages, often a relatively small proportion of a life insurer's assets where a full range of asset classes is available, depends

on the nature and purpose of the property, the proportion of the loan to value of the property, and the priority of the mortgage category. Particularly if supervisors do not have the capacity to review a mortgage portfolio through offsite analysis, such characteristics should determine the admissibility of mortgages. The auditor's report should verify that the rules have been followed.

The equity investments—shares and direct ownership of property—are purchased in the expectation of a higher investment yield. Their volatility, especially for shares, is such that the proportion of the total asset portfolio in shares for the insurance classes depends on the particular products and the insurer's financial strength. For example, if the business is mostly participating business, the declared bonus rates depend on the overall yield, making possible a higher proportion than for an insurer writing predominantly insurance without profit-sharing features and for which the insurer bears all investment risk. In all cases, the quality of and the proportion invested in the equity categories should be reviewed.

It is normal for credit to be allowed under stated conditions for reinsured business for both accounting and prudential purposes. For prudential purposes, the credit may be restricted to licensed reinsurers in the jurisdiction and local branches of approved international reinsurers. The amount of credit may be restricted based on the credit rating and claims-paying-ability rating of approved reinsurers or on a proportion of the value of the reinsured business. In any event, the supervisor must be satisfied that the credit risk assumed is within prudential limits and is acceptable as an asset of the primary insurer. Where information about a reinsurer is not accessible to the supervisory authority, it is advisable for no credit to be allowed to the primary insurer.

Reinsurance credit is not always a balance sheet asset. It can be taken into account indirectly in the technical provisions by specifying the proportion—for example, 80 percent of the calculated reinsured policy liability as the maximum—that can be deducted when calculating the insurer's net policy liability.

Liquidity

For a life insurer that is continuing to write new business, liquidity is rarely a problem. The income from the continuing annual premiums and investment earnings usually exceeds the outgo, and the excess adds to the asset portfolio.

For the investment-linked business and other business written by single premiums, where an early-surrender value is available and the policyholder decides when to terminate the policy, liquidity is always necessary but seldom a major concern, provided the total readily marketable assets are substantial.

Currency

Currency matching so that the assets are invested in the currency in which the policy obligations must be met is required largely to avoid undue exposure to currency risk. In addition to the normal counterparty credit risk of the issuer, there is the risk that exchange controls could be imposed or that the exchange rates between the currencies concerned could change.

The acceptable proportion of admissible assets invested in a currency different from that of the liabilities depends to some extent on the insurer's financial strength. For example, if the insurer holds total assets close to the minimum required solvency margin and a substantial proportion of those assets are in foreign currency assets, then an adverse change in the relevant exchange rates could lead to insolvency at an early date; if the proportion of the assets in the foreign currency is small, difficulties could still arise if the adverse change in exchange rates is severe. Even for insurers with a strong financial condition, it is advisable to hold an appropriately high proportion of assets in the currency of the liabilities.

For unit-linked investment business, matching is a concern only if the policy contract is not fully and clearly expressed. It is vital that the policy literature explain fully how the policy values are linked to the investments and how the unit prices are calculated for payment of a claim.

Duration

Duration matching of assets to liabilities is important to reduce the exposure of the insurer to the effect of movements in interest rates. The claims each year are projected—an actuarial calculation based on the current valuation assumptions—and compared with the expected proceeds of available assets in those years. The results are then expressed by comparing the average duration of assets to that of liabilities. An insurer may prefer to match duration in several ranges—for example, expected liability payments over one year, two to five years, five to ten years, and over ten years. These results may or may not be included in the statistical returns, but they should be noted and commented on in the financial condition report.

If the duration of assets is longer than the duration of liabilities, sufficient cash flow may not be available to meet claims due for payment, and assets may need to be sold before maturity. Assets sold on disadvantageous terms cause losses or lower profits and lower financial strength. If the duration of assets is shorter, maturity proceeds have to be reinvested and may not provide the previously anticipated returns, which reduces the profitability on existing business.

Where there is a mismatch, the potential exists for a change in market interest rates to adversely affect the insurer's financial condition. If interest rates fall, the present value of the liabilities rises. The value of the fixed-interest securities also rises, but to a

different degree, and the other asset categories can behave quite differently. The effect of the decline in interest rates is to reduce the surplus of assets over liabilities, with a consequent reduction in the solvency margin if the assets are a shorter duration than the liabilities (as is normally the case). Because this situation is nearly always present, the solvency and capital adequacy requirements (section G) may include an explicit or implicit “resilience reserve.” The effect of the assumed change in interest rates on policy liabilities and assets is measured and incorporated in the resilience reserve.

Additional comments

As a practical matter, the insurer’s assets in respect of its life insurance business are generally held in the name of the insurer rather than separately by each life insurance fund of the company. A nominal allocation of the assets and the consequent investment revenue should be made to the various funds and, if necessary, within a fund to the business classes. For some items, such as inadmissible assets, a precise allocation in this manner may be difficult, and an averaging process may become necessary.

This module does not discuss the use of derivatives and synthetic asset instruments. For life insurers, their use should be restricted to hedging risks, such as currency risk and interest rate risk. Such hedging may reduce the resilience reserve otherwise required. They should not be used for speculation or simply to enhance income. Derivatives carry their own risks and can become liabilities rather than assets, as intended. A separate module introduces derivatives and similar instruments (module ICP 22A).

This module also does not discuss the more technical aspects surrounding the investigations that insurers may adopt for ALM purposes, such as stress tests (section H) and “convexity,” a measure of the rate of change in the difference between the duration of assets and the duration of liabilities as interest rates change.

The financial condition report should comment on the overall suitability of both the investment policy and the asset portfolio in some detail in view of their impact on the actuary in pricing new business, the valuation assumptions, and valuation results for the existing business.

Considerable detailed information on the life insurer’s asset portfolio at the balance date and the investment transactions during the year is required as part of the annual returns. These data are analyzed for mix of business, credit quality, liquidity, currency, and concentration of investments in related entities.

The supervisor needs to share any remaining concerns about investments and assets directly with the insurer and, if necessary, direct the insurer to implement some other available action, such as holding additional capital.

Exercises

- 24. What is an ALM process intended to achieve for a life insurer?**
- 25. Are there any regulatory standards regarding ALM in your jurisdiction?**
- 26. Is sufficient information available regarding assets in the statutory returns for you to be satisfied about their suitability for the liabilities assumed?**
- 27. Are you in a position to gauge the implications of a substantial decline in the values of an asset class or a particular security?**
- 28. In what circumstances might the use of derivatives be acceptable?**

G. Solvency and capital

Solvency is fundamental for a life insurer to continue to operate and be in a position to meet all claims of its policyholders and other creditors as they fall due. Solvency has been defined slightly differently for different purposes. A basic definition is “solvency is the ability for an insurer to meet its obligations under all contracts at any time.”

Given the uncertainty of the frequency, timing, and amount of policy claims, the basic definition is insufficient for a life insurer to continue operating safely and profitably. There cannot be a guarantee of solvency. Nevertheless, life insurance supervisors require life insurers to maintain a high probability of solvency. Accordingly, there needs to be an excess value of assets over the assessed value of liabilities at all times. The excess is referred to as the solvency margin. Regulations and rules are therefore promulgated to ensure that there is a minimum value of excess assets known as “the required solvency margin.”

The full solvency regime in a jurisdiction requires the insurer to have the following, in addition to sound operating procedures and internal controls for the reinsurance, marketing, and investment strategy and for all administration functions:

- Valuation of all liabilities, including policy liabilities
- Quality, liquidity, and valuation of assets
- Matching of assets and liabilities
- Suitable forms of capital
- Capital adequacy requirement.

Refer to ICP 23 for more detail.

The required solvency margin may include specified parameters for insurance risks, asset risks, and operational risks. The various parameters are determined by taking into account the degree of conservatism in the valuation standards for liabilities and assets in the jurisdiction.

The establishment of an appropriate required solvency margin can be complex. The realistic risk-based method for valuing the policy liabilities is useful for this purpose and for interpreting the overall strength of the financial condition of the insurer. Nevertheless, the net premium approach requires considerably fewer resources and experience and is often adequate for the traditional insurance classes, especially when some risk-based elements are included.

An insurer generally intends to stay in business over the long term and to continue writing new business as a growing entity. The prudential solvency regime normally assumes this “going concern” basis when establishing the required solvency margin standard. The basis assumes that, in addition to assets sufficient to meet existing liabilities, sufficient capital will be available, including from future operations, to finance all obligations of the insurer as they arise, even if future conditions deteriorate and adversely affect the insurer.

For a variety of reasons, an insurer may elect or be forced into a position where the only choice is to cease writing new business and limit itself to administering its existing business. Such a situation might occur, for example, where the parent company of a life insurer subsidiary has decided to stop operating the insurance business as a going concern, or it may arise when an insurer's reinsurance program fails to meet its commitments. In cases where no new capital is forthcoming, the "runoff" solvency basis—to meet the existing contracts at the valuation date—is appropriate if the solvency standard is sufficiently strong.

Where the situation has developed so that asset sales are required and the likelihood of insolvency is significant, a "break-up (wind-up)" or liquidation basis becomes necessary.

This section comments on the going concern solvency regime with which the supervisor normally has to work.

ICP 23 refers to "solvency control levels"; for more discussion, refer to IAIS (2003b).

The IAIS Glossary of Terms notes that the term solvency margin is imprecise and also refers to other terms such as available solvency, required solvency margin, surplus capital, required capital, and required surplus (see IAIS 2006).

As noted in section E, the policy liability is calculated either on a realistic basis—that is, based on the actuary's best estimate of the mortality and other risks—or according to the assumptions, including a provision for adverse deviations.

Regardless of how the policy liabilities have been estimated, the risks associated with the assumptions include the following:

- Misestimation of the mean expected experience
- Deterioration of the experience
- Adverse statistical fluctuations about the mean
- Unexpected changes in the underlying distribution of the experience.

When assessing solvency, adverse changes in the assumptions need to be considered so that the solvency margin will be adequate even if more serious conditions occur. For example, the mortality rate for insured lives could be assumed to be, say, 10 percent higher, lapse rates 20 percent higher, expenses 3 percent higher, and investment yield 0.5 percent higher than used in the technical provisions. In practice, the parameters adopted for the required solvency margin must take into account the relative strength already assumed in the liability valuation assumptions.

The necessary computation of the required solvency margin can be quite complex and is not covered here.

The normal position of the balance sheet can be expressed as the total assets needed to equal full statutory solvency requirements plus excess admissible assets plus inadmissible assets. These excess assets are regarded as capital but are often not all available for distribution outside the insurance fund.

Capital is often regarded as the excess of total assets above the policy liabilities, although in some jurisdictions, “capital” may refer to the excess above the solvency requirement. However, capital is not necessarily available to be distributed outside the fund, since some part of it may have to be held back to meet additional regulatory requirements. The position relating to this and the following two items on capital adequacy and target surplus is broadly illustrated by a hypothetical example in box 1.

Capital adequacy

ICP 23 on capital adequacy and solvency notes that capital adequacy requirements are part of a solvency regime. Module ICP 23A on solvency principles and structures discusses the issues in some detail.

The relevant additional capital support may be prescribed in standards, or it may be determined by the insurer based on stress tests (see section H).

Target surplus

The various statutory and regulatory requirements in place in a jurisdiction may include rules, or the supervisory guidelines and actions may convince the industry of the need for a buffer in excess of the minimum capital adequacy required. Such an approach is desirable for both the supervisor and the insurer. It indicates a margin to ensure that, if the excess assets decline, there is scope for the insurer to rectify its position. It will be able to meet the capital adequacy standard, either directly by using excess assets or indirectly by taking other remedial action at an early stage.

An example with hypothetical percentages of total balance sheet assets is presented in table 1. They reflect only a possible outcome; there can be very wide variations, especially by business class.

The solvency margin required with respect to policy liabilities varies significantly by class and often by product within a class. Equally, there are associated differences in the amounts of required solvency margin and capital and their relationship to the policy liability values. For example, the requirement for investment-linked business with no guarantees is essentially to cover operational risks, and the solvency margin will be a small proportionate increase, perhaps 1 percent of the account balance but still a significant absolute amount. In contrast, for term insurance, the strict liability value can be negative, but for solvency it can be a substantial positive amount.

The mix of business varies so much that a simple comparison of insurers’ results is rarely helpful.

Financial analysis is undertaken by fund and class of business and is made for the solvency reserve ratio and for the solvency coverage. It can be done from notes in the financial statements.

Table 1. Sample Capital Adequacy and Solvency Position

<i>Item</i>	<i>Percent of total</i>	<i>Capital adequacy requirement</i>	<i>Minimum solvency requirement</i>
Total assets	100		
(Inadmissible assets)	(2)		
Admissible assets	98		
Excess assets	3		
Target surplus assets (solvency control level)	5		
Additional capital adequacy requirement	6	6	
Required solvency reserve (solvency margin)	12	12	12
Technical provisions (policy liabilities)	68	68	68
Other liabilities	4	4	4

The solvency reserve ratio

Solvency reserves (M) can be defined as the excess of the total assets required to meet the minimum solvency requirement under the solvency regime (R) over the total of the technical provisions (V) and other liabilities (O)—that is,

$$M = R - V - O.$$

The solvency ratio is the ratio of solvency reserves to the solvency requirement:

$$\text{The solvency ratio} = \frac{100 \{M\}}{\{R\}}.$$

The ratio varies greatly by class of business and design of the solvency regime—for example, it could range in excess of 100 percent to less than 10 percent—but should be reasonably consistent from year to year within a class in an insurer.

The solvency coverage ratio

The solvency coverage is the ratio of the solvency reserve to the available assets for solvency purposes—that is, total admissible assets (A) less technical provisions less other liabilities:

$$\text{The solvency coverage} = (A - V - O) / M.$$

This is not normally presented as a percentage. The ratio also varies between classes, but probably to a lesser degree than the solvency ratio.

Alternatively, or in addition, the capital reserve ratio and the capital coverage ratio, calculated in a similar manner, can be used.

Exercises

- 29. What are the major requirements of a solvency regime?**
- 30. Are they in place in your jurisdiction? If yes, are they statutory or supervisory guidelines?**
- 31. What action would be taken in your jurisdiction if an insurer does not fully meet the solvency requirement, but is close to doing so?**
- 32. What analysis of solvency would you expect to see in the documents received? What would you do with it?**

H. Additional comments and summary

This section offers final comments on the importance of the financial condition report, early-warning systems, rating agencies, and stress testing.

Financial condition report

As noted in several of the earlier sections, a signed report from the accredited qualified actuary of a life insurer is a very important document, and in many jurisdictions it is a statutory requirement. The report is for the benefit of both the board, with a duty to shareholders as well as a responsibility to policyholders, and the supervisory authority, with a duty to protect policyholders.

A comprehensive financial condition report is valuable for both the insurer and the supervisor. It is expected to discuss and comment on the following items, often in considerable detail:

- The nature of the business, including countries of operation, separation of insurance funds, classes of business and products, and performance by growth and market share
- The reinsurance program, including details and its suitability
- Data quality, including steps to verify its relevance, completeness, and accuracy
- Risks underwritten, including all policy guarantees and any contractual options
- Adequacy of premium rates relative to underwriting strategy
- Experience of all insurance risks (including lapses and surrenders), investment earnings and costs, acquisition expenses (including commissions), and administrative expenses
- Investment policy and its suitability and implementation
- Assets summary and mix, changes from prior year, and suitability to liabilities
- Valuation of liabilities, including methods, assumptions, and changes from previous year
- Profit or surplus, including analysis by source, movements and observed trends, distribution recommended for policy bonuses, dividends, and retained capital
- Solvency and capital adequacy, including the future needs shown by observed trends and or business plans and likely sources of capital.

A summary or certification should verify that relevant statutory requirements have been met, highlight particular items, and include a variety of recommendations for action. Although the statutory actuarial role may be limited to the technical provisions, a wider view may be taken. As a result, the full report is not generally made public, and

the actuary can be expected to be forthright with views on all or most aspects of operations, warning of potential problems and calling for corrective action.

Not all jurisdictions require a financial condition report to be prepared or, if they do, require insurers to submit a copy of the financial statements to the supervisory authority. As noted in the section on profitability, if no financial condition report is provided, the supervisor should seek a copy if one exists or otherwise request a special report from the actuary on all items of concern. The authority should use all of the powers available to it in view of the importance and usefulness of such actuarial reports.

Sometimes the actuary will refer to other reports prepared for the insurer during the year. In this case, consideration could be given to seeking a copy of those reports, particularly if they relate to important issues. For example, the financial condition report may comment on a separate liability valuation report as providing more detail on how the assumptions were determined.

If parts of the report are inconclusive or not clear, the reviewer should clarify the matters before proceeding further. This is sometimes best handled by a face to face discussion with the actuary to ensure a full understanding of the position, especially where written communications remain unclear.

Early-warning systems

Supervisory authorities normally have limited resources and need to identify those insurers that require immediate attention or appear to be heading into difficulties. It would be advantageous for supervisors to have an early-warning system to identify insurers expected to get into financial difficulties.

Such systems are frequently based around a set of indexes or ratios. The best known is the IRIS system in the United States. Where the calculated ratios for an insurer are outside the predetermined index, the insurer is deemed to raise concerns and is the subject of urgent further investigation. The United States has thousands of life insurers, and the index ratios have been determined from the results of insurers that recently became insolvent or experienced financial stress. The ratios are reviewed periodically for continued relevance.

The situation in other countries can be quite different, and the IRIS index ratio values may not be appropriate for an early-warning system for life insurers. Even if an index is deemed to be useful, the expected ratio value will be different.

Properly established ratios may be useful for identifying potential problem insurers, but they are not necessarily good indicators of an adverse financial condition. A true financial status can be discerned only by a close review of the statutory reports and returns conducted by experienced persons.

Although ratios can be useful and are widely used for non-life insurance, they are much less useful for life insurers. Indeed, a number of life supervisors decline to adopt them for review purposes. Life insurers develop distinctive business portfolios with

a wide range of risks, terms and conditions, and technical provision impacts, which makes meaningful comparison of ratios difficult.

To establish a useful early-warning system, each jurisdiction needs to develop its own indexes and associated parameters. For this, extensive, consistent, and good-quality data covering several years are required. The limitations of the system need to be recognized and results treated with caution.

It is usually considered more desirable to adopt a systematic approach and review the statutory returns and financial condition reports, where required, and then make calculations along the lines mentioned in this module. Together with an onsite review and any other valid information that is available, the supervisors can make an informed decision.

Rating agencies

Financial sector companies often consider information provided by rating agencies when they make financial decisions. They use credit ratings for a wide range of debt and debt-substitute hybrid instruments to help them to choose assets for quality, volatility, and yield consistent with their tolerance to risk. Insurers use them to identify reinsurers with whom they are willing to deal.

Prudential standards frequently include reference in the criteria for admissible assets to specific acceptable credit ratings from approved rating agencies. Supervisors can come to a ready conclusion regarding counterparty risk for asset portfolios in these circumstances.

Specialized agencies also provide “claims-paying-ability” ratings of insurers and reinsurers. These can be useful for reinsurers in determining whether they will accept an insurer’s business as well as for insurers in selecting their reinsurance program.

There is a problem when life insurance supervisors use ratings to assess the insurers’ claims-paying abilities. To do so implies that rating agencies are quasi-regulators. This is not their function, and, as commercial entities, they are subject to overt and covert pressures to avoid or minimize publishing negative comments about their customers. They neither expect nor do they wish to be treated as substitute prudential regulators.

Nevertheless, supervisors could make a limited but reasonable use of such ratings, especially after a rating agency has downgraded its rating of the ability of a particular insurer to meet claims, to indicate that an urgent comprehensive prudential review is necessary or desirable.

Stress testing

The actuary should undertake stress testing of the financial condition and convey the results to management and the board of directors in the financial condition report. If

the insurer has the capability and necessary data, stochastic methods may be used. Any stress test needs to be interpreted with care. Stress tests do not predict what will happen; rather, they examine what could happen in a particular situation.

A stress test is useful only if it relates to the insurer's business portfolio and the insurance and other risks. The purpose is to consider the effect of substantial, but not impossible, threats to the insurer's financial strength.

A scenario test considers the impact on the insurer's position of simultaneous adverse changes in a number of factors. This can be a complex procedure, and interpretation of the results is difficult.

A simpler approach is to conduct a series of separate sensitivity tests for several of the significant risk factors, assuming deterioration in the assumptions, such as higher mortality rates for insured lives or reduced mortality for annuitants.

A standard sensitivity test evaluates the effect of a movement in interest rates on the value of the asset portfolio or a shift in the investment policy on the composition of the asset portfolio. This may be the approach adopted for establishing the resilience reserve requirements noted in section F.

A supervisor may undertake a simple sensitivity test on the asset portfolio. For example, a fairly regular situation is a declining ("bear") stock market, and this may develop into a very substantial fall in the value of equity shares. Life insurers react in different ways, depending on their financial strength and the nature of their liabilities, perhaps by using derivatives, which become more and more expensive as the market falls further, or by selling shares and reinvesting in fixed-interest securities and accepting the loss. A long bear market may result in a 50 percent or more fall in the equity category. The insurer or possibly the industry can be severely weakened if it holds a higher than desirable mix of equities for policies with guaranteed benefits. The sensitivity test after a fall of, say, 25 percent in the equity class value may lead the supervisor to issue directions requiring additional capital.

IAIS (2003c) provides more background information and technical details.

Exercises

- 33. Given a financial condition report, what information, beyond that already in the financial statements, will you review and why?**
- 34. Does your jurisdiction use early-warning ratios for offsite analysis?**
- 35. For what purpose, if any, do you use credit and claims-paying-ability ratings?**

Summary

Analysis and review of the statutory financial and statistical returns are essential. The extent of the analysis depends on the availability, completeness, accuracy, and quality of data over successive years. Adequate standards and rules for accounting, auditing, and actuarial requirements are needed for prudential purposes.

There are always substantial variations in business mix, marketing, pricing, investments, and internal controls among different insurers. Industry-wide analysis is useful but has some limitations. Regular offsite analysis, together with the periodic onsite reviews of individual insurers, is expected to provide sufficient information to enable the supervisory authority to assess the ability of the insurer to meet its obligations to policyholders. Supervisory concerns can sometimes be resolved after receiving and analyzing further information from the insurer. In some cases, the analysis may lead the supervisor to direct the insurer to take specific remedial actions.

Exercises

- 36. An insurer decides not to seek an independent audit of its annual financial statement because it is very expensive, and it is content to rely on its own resources, which are widely acknowledged as excellent. Is this satisfactory for the supervisor? Yes or no?**
- 37. An insurer is concerned to ensure that it is well regarded by insurance intermediaries and has a top standing in terms of new business written. Its strategy is to write as much new business as it can obtain. Recently, it achieved second place in new business statistics and is now seeking top place. It is receiving many applications to join from other agents. Its lapse rate is 30 percent, which is twice the industry average; all other companies' rates range from 8 to 20 percent. As the supervisor, do you consider:**
- This strategy is possibly detrimental to the policyholders, but otherwise satisfactory
 - You need more up-to-date financial information and request it
 - This is a poor strategy for the insurer to adopt and should be rectified
 - Although not a desirable strategy, for several reasons, it is acceptable because it is proving popular.
- 38. It is only worth reviewing the insurers' latest results because making comparisons with earlier years is not a good use of the supervisor's resources, adding little, if any, value. True or false?**
- 39. When reviewing an insurer's claim payments and rates for the insurance classes, what components would you investigate?**

- 40. An insurer is profitable each year and distributes up to 80 percent of the net profit to its shareholders, with an average distribution rate over many years of 60 percent. It states that this demonstrates that it is in a sound financial position and can be expected to continue in business. Do you agree? State your reasoning.**
- 41. An insurer writes a large volume of term insurance and participating endowment insurance. Its substantial asset portfolio consists of 20 percent invested in its parent company, 20 percent in government bonds, 20 percent in a low-grade BB- corporate bonds; 10 percent in the property it occupies, 10 percent in a good-quality marketable equity share, 5 percent in the associated reinsurer with which it has placed its total reinsurance program, 5 percent in a high-grade AAA overseas bank, and 5 percent each in two small local mining company shares. State five or more criticisms of the investment policy.**
- 42. An insurer knows that it must have a good reinsurance program to maintain its credibility with the market and policyholders. It decides that this is best achieved by contracting with overseas reinsurers on competitive terms for standard products, although it has little information on their financial condition. It has no catastrophe cover. Its own net retention rate appears to be satisfactory. As the supervisor, do you consider this overall program as satisfactory, and what are your reasons?**
- 43. There are no actuaries in the jurisdiction and unlikely to be any in the foreseeable future. The supervisor does not have the financial resources to contract overseas actuaries to help evaluate the insurers' liabilities and solvency status. Would you:**
- a. Accept the returns provided by the industry because there is no alternative
 - b. Adopt a net premium policy liability valuation basis using an international standard such as those in the European Union directives and require each insurer to obtain a valuation at the latest balance date
 - c. Determine that the solution is to establish suitably conservative standard premium rates for the various products
 - d. Require the insurers to invest only in government bonds and deposits in AAA-rated licensed banks.
- 44. An insurer writing mainly unit-linked investment business cannot see why it needs to comply with a capital adequacy standard. Explain what risks it has to meet.**
- 45. Stress tests are of no real value since they are difficult to do, the expense involved in doing them is high, and the results are complex and hard to understand. True or false?**

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Appendix I. ICP 12

ICP 12: Reporting to supervisors and offsite monitoring

The supervisory authority receives necessary information to conduct effective offsite monitoring and to evaluate the condition of each insurer as well as the insurance market.

Explanatory notes

12.1. It is essential for the supervisory authority to receive information necessary to conduct effective offsite monitoring, which can often identify potential problems, particularly in the interval between onsite inspections, thereby providing early detection and prompting corrective action before problems become more serious.

12.2. The supervisory authority decides what information it requires, in what form, from whom, and with what frequency. The reporting requirements are a reflection of the supervisory needs and will thus vary according to overall market structure and situation. They also reflect the situation at individual insurers and the way they control their risks (for example, asset-liability management, reinsurance policy). Information should be both current and prospective in nature. In setting the requirements, the supervisory authority should strike a balance between the need for information for supervisory purposes and the administrative burden it puts on insurers.

12.3. Reporting requirements should apply to all insurers licensed in a jurisdiction and form the general basis for offsite analysis. The reporting requirements should be reviewed periodically. Additional information may be requested from specific insurers on a case-by-case basis. New developments may require the supervisory authority to carry out market-wide offsite analyses, which will require having insurers to submit information on an ad hoc basis.

12.4. In setting the requirements, the supervisory authority may make a distinction between the standards applied to reports prepared for disclosure to policyholders and investors and those applied for the supervisory authority.

12.5. In setting the requirements, the supervisory authority may make a distinction between the financial reports and calculations prepared for companies incorporated in its jurisdiction and branch operations in its jurisdiction of companies incorporated in another jurisdiction.

Essential criteria

- a. The supervisory authority:
 - Sets the requirements for the submission of regular and systematic financial and statistical information, actuarial reports, and other information from all insurers licensed in the jurisdiction
 - Defines the scope and frequency of those reports and information, including any requirement that reports and information be audited
 - Requires, as a minimum, an audit opinion should be provided annually (refer to ICP 1, essential criterion e)
 - Requests more frequent and more detailed additional information whenever there is a need.

- b. If making a distinction between the financial reports and requirements of companies incorporated in the jurisdiction and branches, or between private entities and government-sponsored insurers that compete with private enterprises, the supervisory authority should not distort the market in favor of or against any particular form of enterprise.

- c. The supervisory authority:
 - Requires insurers to submit information about their financial condition and performance on both a solo and a group-wide basis. It may request and obtain financial information on any subsidiary of the supervised entity
 - Sets out the principles and norms regarding accounting and consolidation techniques to be used; the valuation of assets and liabilities should be consistent, realistic, and prudent (refer to ICP 21, essential criterion b)
 - Requires insurers to report any off-balance-sheet exposures
 - Requires insurers to report on their outsourced functions
 - Requires that the appropriate level of an insurer's senior management is responsible for the timing and accuracy of these returns
 - Requires that inaccurate information be corrected and has the authority to impose sanctions for deliberate misreporting
 - Based on this information, maintains a framework for ongoing monitoring of the financial condition and performance of the insurers.

Advanced criteria

- d. From time to time, the supervisory authority reviews its regular and systematic reporting requirements to ensure they still serve their intended aims and are carried out in an efficient and effective manner.
- e. The supervisory authority requires insurers to report promptly material changes that affect the evaluation of their condition.

Appendix II. Case study

This case study demonstrates that ratios for analysis are a useful tool for a supervisor. The figures in table II.1 are not representative of any life insurer. However, insurers do pass from a sound financial condition to failure over a short period.

The table presents the accounts of a life insurer for the latest and two previous years.

Table II.1. Profit and loss account for a three-year period

<i>Item</i>	<i>Year 1</i>	<i>Year 2</i>	<i>Year 3</i>
<i>Income</i>			
Gross premium income (<i>GP</i>)	1,000	1,100	1,300
Reinsured premiums (<i>RP</i>)	250	200	250
Net premium income (<i>NPI</i>)	750	900	1,050
Investment revenue (<i>I</i>)	80	95	25
Total income	830	995	1,075
<i>Outgo</i>			
Gross claims (<i>GC</i>)	625	700	840
Reinsured recoveries (<i>RC</i>)	100	90	100
Net claims (<i>NC</i>)	525	610	740
Expenses (<i>E</i>)	200	245	310
Change in policy liabilities (<i>V</i>)	20	30	35
Total outgo	745	885	1,085
<i>Profit</i>			
Gross profit	85	110	(10)
Taxes	21	27	(2)
Net profit	64	83	(8)

A simple examination of the table shows the company increasing gross premium, with reinsured premiums variable and net premium in force steadily increasing.

Investment revenue declined dramatically in year three.

Claims increased each year, as did expenses. In spite of rising premium income, the movement in policy liabilities was small and reasonably stable.

Profit increased in year two but declined dramatically in year three, resulting in a loss.

Table II.2 indicates ratios for growth performance year to year. Some were discussed in the module; others have been included to show the developing problem more clearly.

Table II.2. Growth performance year to year (percent)

<i>Item</i>	<i>Year 1–Year 2</i>	<i>Year 3</i>
<i>Income</i>		
Gross premium income (<i>GP</i>)	10.0	18.2
Reinsured premiums (<i>RP</i>)	(20.0)	25.0
Net premium income (<i>NPI</i>)	20.0	16.7
Investment revenue (<i>I</i>)	18.8	(73.6)
Total income	19.9	8.0
<i>Outgo</i>		
Gross claims (<i>GC</i>)	12.0	20.0
Reinsured recoveries (<i>RC</i>)	(10.0)	11.1
Net claims (<i>NC</i>)	16.2	21.3
Expenses (<i>E</i>)	22.5	26.5
Total outgo	18.8	22.6
<i>Profit</i>		
Gross profit	29.4	(109.1)
Net profit	29.7	(109.6)

When queried after year two, the insurer, which had been a stable, conservative company, indicated that it had decided to grow faster and improve profits. Its strategy was to add new sales agents, revise its reinsurance program to “give less money away,” and improve investment performance by investing more in shares. On the basis of the first table, it concluded that it had done well because net profit had increased. A review of the second table would have shown that the contributors to profit had not done uniformly well.

A review of the reinsurance program and expenses might have caused concern with the results during year three. Instead, the company considered only premium growth and was even more ambitious about writing more business to generate even higher net profit.

After year three, the insurer agreed that, although results had deteriorated, it made only a small loss and that year four would improve, as the stock market would recover dramatically. It failed to see the dangers in its reinsurance arrangements and the uncontrolled expenses connected with its growth plans.

Table II.3 shows the calculated values of some of the business ratios discussed in the module. The effect of the revised reinsurance plan on claims ratios is more evident.

Table II.3. Business ratios for a three-year period (percent)

<i>Business ratios</i>	<i>Year 1</i>	<i>Year 2</i>	<i>Year 3</i>
Reinsured <i>P</i> / gross <i>P</i>	25.0	18.2	19.2
Net <i>P</i> / gross <i>P</i>	75.0	81.8	80.8
Net <i>C</i> / gross <i>P</i>	52.5	55.5	56.9
Gross <i>C</i> / gross <i>P</i>	62.5	63.6	64.6
Reinsured <i>C</i> / gross <i>P</i>	10.0	8.2	7.7
Reinsured <i>C</i> / reinsured <i>P</i>	40.0	45.5	40.0
Net <i>C</i> / net <i>P</i>	70.0	67.7	70.5
<i>I</i> / net <i>P</i>	106	106	2.4
<i>E</i> / net <i>P</i>	26.7	27.2	29.5
<i>Abbreviated balance sheet</i>			
Admissible assets	1,000	1,020	960
Other liabilities	50	60	65
Policy liabilities	380	410	445
Solvency and capital reserves	305	240	410
Excess assets	265	210	40

Technically, the insurer is solvent, but its position is serious, with excess assets falling swiftly in the latest year. It is no longer profitable, and the signs are for a continuing decline based on the business plans.

The supervisory authority needs to take action to protect the policyholders. It is always dangerous to assume that the equity market will improve markedly, but it is particularly dangerous when the company is in a weak condition. Its expenses are becoming excessive compared with the market. The changes in its reinsurance philosophy have turned a once-successful reinsurance policy into an inappropriate one.

In fact, the company has been unsuccessful in changing from a conservative policy and strategy to an aggressive marketing approach.

The supervisor's actions to protect policyholders could include requiring some or all of the following: an immediate infusion of capital, improved internal controls with strong independent external oversight, a monthly report from the insurer, including updated financial statements and an actuarial report, a significantly improved reinsurance strategy, a more appropriate investment policy for its monetary guaranteed liabilities, and new business plans to cope with the company's current financial situation.

Appendix III. Answer key

Pretest

1. c
In some jurisdictions, c and d are the same date for all life insurers.
2. d
3. b
The chief financial officer, the actuary, and the board of directors also have very significant responsibilities.
4. b
Ensuring that the interests of policyholders are met is the primary purpose, although c, complying with the insurance laws, is necessary. The returns may contribute to both a and d.
5. a
6. a
7. d
Reinsurance is most important for spreading insurance risks, and it can be useful for other purposes. Both a and b are examples of risks that may be spread.
8. c
In order to be viable, an insurer must also produce acceptable returns for its shareholders, so profitability, but not necessarily short-term profitability, is also an important factor.
9. a
The assets must be suitable to meet the actual policy liabilities, and for this purpose several factors—for example, diversification among different types of assets—have to be considered in setting the investment policy.
10. c
The financial condition report is an important document and should provide much useful information to senior management, the board, and the supervisor.
11. b
The valuation process is complex and needs to be comprehensive, since the proper valuation of liabilities is essential to a life insurer's long-term viability.

Exercises

1. *What characteristics do the statements received for analysis have to have in order to be useful?*

They need to be timely, complete, accurate, consistent over successive years, and consistently prepared by all life insurers. They must also conform fully with the financial reporting accounting standards and statistical reporting prudential standards applicable in the jurisdiction.

2. *Do these conditions exist in your jurisdiction?*

If they do not, comment on the current position and what is needed to improve them.

3. *After calculating relevant ratios, how will you use them?*

You will use them to indicate whether (a) the financial condition of the insurer is sound, (b) there has been compliance with statutory rules, (c) any trend over recent years gives cause for supervisory concern, and (d) any substantial difference from the results of other insurers can be explained.

4. *Will all insurers reviewed have similar values? If not, why not?*

No. Different life insurers concentrate business operations on different classes of products and on products with different characteristics and financial requirements.

5. *What influences affecting the products and volume of business written by the industry have been evident over the last five years, and what expectation do you have for such influences over the next five years?*

It depends on the situation in a given jurisdiction. Note any changes or prospective changes in the economic or social environment and any consequent political and legislative action (prudential, tax) affecting the life insurance industry or community attitudes to life insurance. Consider also whether either the industry as a whole, or several of the insurers, has implemented its own marketing decisions regarding the products and distribution methods adopted, or expected to be adopted, in response to those changes. Changes could include discarding existing products, concentrating on new products or products with amended benefits, changing the methods of distribution, and so forth.

6. *Why is it necessary to calculate ratios for different classes of business as well as the total?*

Each business class has its own general attributes, with different valuation and solvency requirements, so that the total results from the different insurers will vary due to the different proportions of each business class written. Depending on the number of insurers licensed, the business mixes of the various classes can be significantly different among the insurers, with consequent variations in the total ratios.

7. *Why is it necessary to use premium as the basis for calculating ratios?*

It is the most useful and reliable measure of an insurer's progress. The number of policies written is inappropriate because a large number of lives may be insured under a group policy, and the sum insured is unreliable because the financial requirements vary significantly for different policy products.

8. *What will you do if there is a significant change in the business mix from last year?*

Investigate further until the reason is established. The reason may be the result of deliberate and acceptable action, but it may have resulted from mismanagement, in which case necessary rectification should be sought and subsequently verified.

9. *What might cause an insurer to write a large volume of new business but have slow growth or a decline in business in force?*

The usual reason is poor-quality new business with a high lapse rate and a high early-surrender rate. Changes in the reinsurance arrangements could also affect net business growth.

10. *Why is a reinsurance program necessary for a life insurer?*

Reinsurance is necessary (a) to manage the insurer's liabilities within its financial capacity to meet claims and satisfy prudential requirements and (b) to limit the insurer's own risk on certain products or on individual lives. An additional motive for some insurers is to supplement their own underwriting or claims management resources with assistance from their reinsurer; also reinsurers can be a useful source of market information and assist in new product design.

11. How might the insurer's financial strength affect the reinsurance program?

A strong financial condition allows a life insurer to retain a high proportion of its gross business and, in normal circumstances, leads to higher profits. An insurer with assets only marginally above capital adequacy requirements needs a carefully designed reinsurance program to be able to continue writing business.

12. What would you do if a proposed reinsurance contract is very complex?

Investigate thoroughly until the exact nature of risk transfer is understood and the accounting and valuation implications are clear. Ideally, if the supervisory authority has the relevant powers, refuse to accept the arrangement for prudential purposes so that the primary insurer has to retain the full liability.

13. What actions might be appropriate if the reinsurer is unable or unwilling to meet claims?

If it is able but unwilling, seek to establish if there is a contractual dispute between the insurer and reinsurer and ensure that the matter is settled, through the legal system if necessary. If it is unable, the primary insurer will have to meet those claims and revise the reinsurance program with other reinsurers.

14. What does profit or surplus as used for the accounts in your jurisdiction represent for a life insurer?

The answer will depend on the jurisdiction. Basically, it represents the excess of total asset values over the total technical provision plus other liabilities; it represents an estimate of the contribution for the particular year to the ultimate profit or surplus on each policy. It sets the base for considering the dividend rate, if any, that can be paid to shareholders and, importantly, the continuing financial strength of the insurer.

15. Are standards for preparing the insurers' financial statements based on a consistent approach for valuing assets and liabilities in your jurisdiction?

If no, some comment on consequences of the mismatch could be revealing. For example, a conservative valuation of net premium liability with market value-based assets will require careful conclusions regarding what the surplus represents and whether policyholder interests and shareholder interests are dealt with equitably.

16. Actual experience for claims is in the accounts. Where would you find the expected experience?

In the actuarial report—that is, the financial condition report—if this is a requirement in the jurisdiction. Otherwise, seek relevant information from the insurer. For example, some relevant information may be found in an insurer’s new product pricing report, but it may be difficult to interpret.

17. What would be a reasonable explanation for an increase in mortality rates in the insurance business classes?

Increasing mortality rates may be caused by external influences such as an epidemic of a fatal disease, a significant change in the mix of business classes, poor underwriting (acceptance of new business risk), or substantial demographic changes, although these reasons should be noted as trend issues.

18. In your jurisdiction, are there ratios for which sufficient information is not available, and what extra information would you need to be able to make the calculation?

The answer depends on requirements in your jurisdiction. Comment should acknowledge missing items, and as much relevant information as possible should be obtained from the insurer regarding the missing items. If it is practicable, it may be appropriate to seek mandatory improvements in the jurisdiction’s rules.

19. Do returns in your jurisdiction include a financial condition report or similar actuarial report? If so, is it comprehensive?

If the answer is yes, comment on what information is available on valuation of the policy liabilities, including reliability of the data, method of valuation, parameter assumptions, results, and movements since the previous year. If no, are other sources of information capable of proving useful to the supervisor?

20. Are sufficient resources available within the authority or externally for a review of the technical provisions?

If the answer is yes, describe the resources. If the answer is no, what, if any, other action is possible for the reviewer—for example, directing insurers to obtain an appropriate independent actuarial report or, alternatively, obtaining such a report directly at the insurer’s expense.

21. *What methods of liability valuation are commonly used (a) in your jurisdiction and (b) elsewhere?*

In general, net premium-based or realistic-based methods are used. The projection methodology is used for the insurance business classes, with an alternative methodology for some temporary insurance products; the investment classes are generally valued by the accumulation methodology.

22. *What is the process for establishing the necessary assumptions in your jurisdiction? Are any alternatives available internationally?*

Describe the process used in the particular jurisdiction. Note if there are any statutory requirements regarding the assumptions. Generally, the actuary determines assumptions at the end of the year for each parameter for particular products, after investigating the actual experience during the year and, as appropriate, allowing for anticipated trends. This process requires good-quality demographic and economic data.

23. *Explain the difference between IBNR and RBNA.*

IBNR is the provision for those claims that experience suggests will be made in respect of the financial year but have not yet been reported to the life insurer. RBNA is the provision for those claims that have been notified to the insurer but have not yet been admitted, but that, experience suggests, will be admitted in due course.

24. *What is an ALM process intended to achieve for a life insurer?*

It is intended to ensure that the assets are suitable to meet the liabilities held by the insurer. Asset liability management provides for sufficient diversification, credit quality, liquidity, and the matching of cash flows from income to expected liability payment to meet total liabilities.

25. *Are there any regulatory standards regarding ALM in your jurisdiction?*

If yes, describe them. If no, describe the checks actually made.

26. *Is sufficient information available regarding assets in the statutory returns for you to be satisfied about their suitability for the liabilities assumed?*

If no, what further information is needed and describe how, if at all, it is obtained. For example, are you satisfied that (a) there is a reasonable mix of asset

types, (b) the overall credit quality is satisfactory, (c) investments in related entities are limited and on standard market terms, (d) sufficient assets are readily marketable to meet all short and medium liabilities, (e) there is limited currency risk, and (f) the average duration relates to the average duration of the liabilities?

27. Are you in a position to gauge the implications of a substantial decline in the values of an asset class or a particular security?

Whether your answer is yes or no, describe the investigations that should be made and any action that should result.

28. In what circumstances might the use of derivatives be acceptable?

For hedging risks only—that is, to minimize the effects of adverse movements in interest rates, currency exchange rates, and the market values of equities.

29. What are the major requirements of a solvency regime?

The major requirements are sound valuations of liabilities and acceptable assets, suitable matching between them, acceptable forms of capital, and a solvency and capital adequacy requirement sufficient to ensure a high degree of probability that all benefits to policyholders and other creditors will be met as they fall due. The regime should commence with strong licensing requirements.

30. Are they in place in your jurisdiction? If yes, are they statutory or supervisory guidelines?

The answer will depend on the jurisdiction.

31. What action would be taken in your jurisdiction if an insurer does not fully meet the solvency requirement, but is close to doing so?

Comment is expected regarding investigations, such as reviewing past results to check whether this has occurred previously. If this is the first occasion, seek from the insurer an explanation and information about any action proposed to rectify the position. If the response is satisfactory, ensure that it is implemented forthwith and verify continuing compliance from monthly reporting. If the explanation is not satisfactory, use whatever powers you have available, such as directing the company to inject new capital in the fund and maintain regular reporting. If deemed necessary, declare the insurer to be insolvent.

32. *What analysis of solvency would you expect to see in the documents received? What would you do with it?*

The solvency ratio and solvency coverage ratio to be disclosed in the statutory returns, together with comprehensive reporting in the financial condition report from the actuary, should show details of the methods and assumptions for policy liabilities, additional solvency and capital adequacy requirements, and comments regarding assets and discussion on future requirements based on the insurer's business plans, including proposals for sufficient capital from excess assets, investment policy, and suitability. You would review this detail and judge the soundness or otherwise of the financial condition of the insurer, with follow-up action if necessary.

33. *Given a financial condition report, what information, beyond that already in the financial statements, will you review and why?*

You will review the complete report (a) to examine business arrangements, mix and growth, reinsurance arrangements, recent experience, and pricing and profitability and (b) to verify suitability of the basis for valuing policy liabilities, asset suitability, and investment policy, solvency and capital adequacy, and the consequences of business plans.

34. *Does your jurisdiction use early-warning ratios for offsite analysis?*

Give your reasons for using them or not. If they are used, comment on how they are used and what reliance is placed on them.

35. *For what purpose, if any, do you use credit and claims-paying-ability ratings?*

Specifically, ratings are used to check the overall credit quality of the asset portfolio to ensure that the insurer has appropriate assets for the business written. Reviewing information on the insurer's claims-paying ability may signal the need to conduct a comprehensive prudential analysis using up-to-date information on profitability and capital adequacy.

36. *An insurer decides not to seek an independent audit of its annual financial statement because it is very expensive, and it is content to rely on its own resources, which are widely acknowledged as excellent. Is this satisfactory for the supervisor? Yes or no?*

No. Explain the reasons why.

37. *An insurer is concerned to ensure that it is well regarded by insurance intermediaries and has a top standing in terms of new business written. Its strategy is to write as much new business as it can obtain. Recently, it achieved second place in new business statistics and is now seeking top place. It is receiving many applications to join from other agents. Its lapse rate is 30 percent, which is twice the industry average; all other companies' rates range from 8 to 20 percent. As the supervisor, do you consider:*

- a. *This strategy is possibly detrimental to the policyholders, but otherwise satisfactory*
- b. *You need more up-to-date financial information and request it*
- c. *This is a poor strategy for the insurer to adopt and should be rectified*
- d. *Although not a very desirable strategy, for several reasons, it is acceptable because it is proving popular.*

The correct answer is b: you need more up-to-date information.

38. *It is only worth reviewing the insurers' latest results because making comparisons with earlier years is not a good use of the supervisor's resources, adding little, if any, value. True or false?*

False.

39. *When reviewing an insurer's claim payments and rates for the insurance classes, what components would you investigate?*

Depending on the particular products written, the answer should include comments such as the position for deaths (mortality); sickness or disability (morbidity); lapses (forfeitures); surrenders; and, if the item is significant, other causes. The ratios for the current year should be calculated if there are sufficient data, and trends should be noted.

40. *An insurer is profitable each year and distributes up to 80 percent of the net profit to its shareholders, with an average distribution rate over many years of 60 percent. It states that this demonstrates that it is in a sound financial position and can be expected to continue in business. Do you agree? State your reasoning.*

No. The insurer may make losses and not profits in later years, and the supervisor has to verify that the financial strength is sufficient both to meet current needs and to help the insurer cope with possible adverse future experience. The supervisor should never be lulled into a false sense of security with any insurer.

41. *An insurer writes a large volume of term insurance and participating endowment insurance. Its substantial asset portfolio consists of 20 percent invested in its parent company, 20 percent in government bonds, 20 percent in a low-grade BB– corporate bond; 10 percent in the property it occupies, 10 percent in a good-quality marketable equity share, 5 percent in the associated reinsurer with which it has placed its total reinsurance program, 5 percent in a high-grade AAA overseas bank, and 5 percent each in two small local mining company shares. State five or more criticisms of the investment policy.*

The answer should include at least five of the following: (a) insufficient diversification, (b) illiquid portfolio, (c) overall poor credit quality, (d) inadequate reinsurance program, (e) uncertain investment return from year to year, (f) losses rather than profits probable in several years, (g) possible currency risk, (h) difficulty in providing satisfactory participation benefits to the endowment insurance policyholders, and (i) a totally unsound asset policy.

42. *An insurer knows it must have a good reinsurance program to maintain its credibility with the market and policyholders. It decides that this is best achieved by contracting with overseas reinsurers on competitive terms for standard products, although it has little information on their financial condition. It has no catastrophe cover. Its own net retention rate appears to be satisfactory. As the supervisor, do you consider this overall program as satisfactory, and what are your reasons?*

It is not satisfactory. More financial information is needed on the prudential standards in the relevant overseas jurisdictions, especially regarding the licensing requirements and the solvency regimes. Information on the international credit ratings of the reinsurers used should be obtained, if available. Currency risk is also a concern, if the currency used for the reinsurance agreements does not correspond to the currency in which the underlying policies were written. The supervisor should exercise any powers it has to require additional capital, unless a more appropriate program is implemented.

43. *There are no actuaries in the jurisdiction and unlikely to be any in the foreseeable future. The supervisor does not have the financial resources to contract overseas actuaries to help evaluate the insurers' liabilities and solvency status. Would you:*

- a. *Accept the returns provided by the industry because there is no alternative*
- b. *Adopt a net premium policy liability valuation basis using an international standard such as those in the European Union directives and require each insurer to obtain a valuation at the latest balance date*
- c. *Determine that the solution is to establish suitably conservative standard premium rates for the various products*

- d. Require the insurers to invest only in government bonds and deposits in AAA-rated licensed banks.*

Of the listed alternatives, answer b is the most appropriate.

- 44. An insurer writing mainly unit-linked investment business cannot see why it needs to comply with a capital adequacy standard. Explain what risks it has to meet.*

Operational risk can arise from poor administration of unit pricing. Difficult areas include determining the correct number of units for the unit price valuation of new business and claims, ensuring the correct identification and valuation of the assets at each pricing, and making equitable adjustments for current and deferred government taxes. Other risks may include investment risk, when the actual investments held are not consistent with the stated investment policy as documented in the policy contract or where the contracts provide minimum performance guarantees, and expense risk, unless the contract provides for periodic revision of the insurer's schedule of management fees.

- 45. Stress tests are of no real value since they are difficult to do, the expense involved in doing them is high, and the results are complex and hard to understand. True or false?*

False.