Core Curriculum for Insurance Supervisors

Module 5.6.1

Solvency - Principles and structures

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Using the Core Curriculum

Purpose

The IAIS Insurance Core Principles (ICPs) provide a globally accepted framework for the supervision of the insurance sector. The ICPs are suitable to apply to insurance supervision in all jurisdictions regardless of the level of development or sophistication of the insurance markets and the type of insurance products or services supervised.

The Core Curriculum provides non-commercial training materials to support insurance supervisors as they implement the ICPs. They give insight and background to the ICPs and the concepts underlying them. There is also a focus on the practical application of supervisory concepts.

Supervisory practices are constantly evolving reflecting experience and changing environments. Consequently, Core Curriculum materials should not be read as providing 'the answer' to a particular issue, but as providing guidance, approaches and matters to be considered by supervisors when they address specific issues in their own particular context.

Audience

The key users of the Core Curriculum material include:

- Trainers of insurance supervisors
- Individual insurance supervisors, and
- Other parties interested in sound and effective regulatory and supervisory practices.

Link document

The Core Curriculum Link document provides a mapping between the ICPs and the Core Curriculum modules. As ICPs and/or the Core Curriculum modules evolve, their relationship is described by the Link document (see www.iaisweb.org). This allows users to navigate from ICPs to relevant Core Curriculum modules and in the opposite direction.

Learning advice

Different users have different needs and so will use the Core Curriculum modules in different ways. The Core Curriculum Learning advice document provides users with suggestions on using Core Curriculum materials to meet a variety of needs. You are recommended to use the Learning advice document (see www.iaisweb.org) to support your use of the Core Curriculum modules.

This module

Summary

The purpose of this Core Curriculum module, 5.6.1 Solvency - Principles and structures, is to give readers an overview of the structure of solvency requirements and the need for capital that may be used across the world. While there need to be references to aspects such as liabilities and assets, because they form an essential part of any solvency regime, these are covered in detail in other modules.

Learning objectives

When you complete this module, you should be able to:

1 Describe the basic elements of a solvency regime

2 Describe what is meant by the terms "capital adequacy" and "solvency" and explain the difference

3 Explain the differences between going concern, run-off, and break-up concepts of solvency

4 Explain each of the following reasons for which insurers need capital:

- a) Financing start-up
- b) Financing growth and diversification
- c) Liquidity
- d) Precaution against fluctuation of asset and liability values
- e) Precaution against adverse experience
- f) Public confidence, and
- g) Statutory purposes.

5 Describe the sources of capital for an insurer

6 Summarise steps commonly taken by supervisors to guard against insolvency of supervised insurers

7 Describe the essential elements of a solvency regime

8 Explain the difficulties in measuring capital

9 Describe the criteria used to assess the suitability of potential forms of capital

10 Explain which risks of insurers are more amenable to being mitigated with capital and which are not

11 Compare the following types of capital requirements:

a) Fixed minimum standards

b) Standards proportional to size, and

c) Risk-based standards.

12 Explain the purpose of solvency control levels

13 Explain why a solvency regime may place different requirements on an insurer operating through a branch and describe some commonly used requirements

14 Describe steps that may be taken to prevent the inflation of capital through double or multiple gearing, intragroup transactions, or other financing techniques available as a result of an insurer's membership in a corporate group

15 Explain the linkages between the ICPs on Solvency and the other ICPs that relate to prudential requirements.

1 Introduction

Insurers, in exchange for the receipt of premiums from their policyholders, take on obligations to pay benefits in the future according to policy requirement.

Whether insures meet these obligations satisfactorily depends on many things. A core issue is for insurers to have adequate financial resources stay in business and to pay benefits when they come due. The topics of solvency and capital adequacy focus on this. These topics are closely related, but not the same. The focus of this module is on solvency. Policyholders have expectations, so the fairness of how insurers and their intermediaries conduct their business are also important. Other modules address other issues such as market conduct.

1.1 What is solvency?

The word solvency can have many meanings. Therefore, it is important to clarify how it is used in this module and more widely by supervisors.

Commonly, solvency can be taken to mean that, at a specific point in time, a provider of services has more assets than liabilities and so has the capacity to pay all its debts thus meeting all its obligations. At a minimum, this is 'cash flow' solvency, meaning that today's obligations can be paid for. This is simplistic and hides may issues and nuances that should be made explicit. Indeed, it is clearly inappropriate for a long-term insurer. Ponzi schemes are cash flow solvent until the point they collapse. Slightly stronger, having assets exceed liabilities may give some confidence, but does not consider liquidity, quality of assets, or future positions.

Usually, business models flow in the direction of making product first and then selling it. Insurance works in the opposite direction, take in premiums from selling a future promise and then sometime in the future delivering the product of the promised benefits. This implies that there is a strong interest, for both policyholders and supervisors, in the insurer being in business at some point(s) in the future. This future focus become increasingly important as the expected time policies will remain in force increases.

The core challenge is therefore to assess the likelihood of an insurer that is in business 'now' still being in business in the future. This is a challenge for both supervisors and insurers. They, and other stakeholders, may take different approaches for making their assessment and so come to differing conclusions. This module focuses on the supervisor's perspective, no those of other stakeholders. This also highlight the need, when discussing 'solvency' to be clear on the context and purpose of the discussion.

The core solvency question to address, therefore, is "How can a supervisor gain adequate comfort that an insurer will remain in business in the future?".

1.1.1 Time horizon

This highlights the need to specify a time horizon so that the 'future' is more clearly defined.

An insurer's obligations at a given point in time, to existing policyholders and claimants, generally will be influenced by future events. Therefore, the obligations can only be estimated. It is impossible to guarantee and insurer that currently appears able to meet its obligations will still be able to do so many in the future. At the other extreme, if an insurer appears able to meet its obligations today but is subject to a high risk that it may be unable to do so tomorrow, then it could not usefully be considered solvent.

A practical compromise employed by many supervisors and solvency regimes, is to use a one-year time horizon. This may also include a requirement to project of business plans for longer period (say 3 years) and a demonstration that capital adequacy is expected to be maintained throughout the projection period. This compromise considers an insurer solvent only if it seems very likely that it will continue to be solvent one year hence.

1.1.2 Uncertainty

The nature of insurance business makes it is impossible to guarantee solvency with certainty. No matter how financially strong an insurer might be, there may be an economic scenario, natural disaster, or human-made catastrophic event that will lead to insolvency.

A key component of solvency of an insurer is its financial strength. In particular, financial weakness is a threat to solvency. As noted later, there are also other important aspects to solvency.

One assessment of uncertainty with regard to solvency is the focus on the financial strength of the insurer. Having specified a time period to work with, a supervisor can then specify a measure confidence to be met for the insurer to be considered financially solvent.

A common, but not the only, approach is to require a high level of confidence that the insurer is not expected to breach the financial solvency requirement in the specified time period. For example, the Solvency II requirement is that there is 99.5 % confidence level over a 1-year time period.

However, the question of how much certainty is necessary or appropriate is a matter of judgment. The process of making such assessment can be complex and challenging. Supervisory judgment may also be required in making assessments once the criteria have been specified.

1.1.3 Purpose

Insurer may experience varying circumstances and so solvency assessment may have varying purposes.

- **Going concern.** Insurers usually seek to operate as going concerns, meaning they are open to new business. Usually without specific supervisory restriction, but with supervisory awareness through appropriate reporting.

  For an insurer to be considered financially solvent on a going-concern basis, it should have adequate financial resources to meet obligations both to existing policyholders and to those who will become policyholders in the future. It is important to note the future orientations of this due to the inclusion of future policyholders. Clearly maintaining going-concern solvency is desirable for all stakeholders.

- **Inforce.** Financial solvency could focus strictly on an insurer's ability to meet its obligations to existing policyholders. That is, no consideration is given to future policyholders. This may be relevant if the insurer ceased writing new business, either voluntarily or at the direction of the supervisor. It may also be the case if legislatively required. In this case, solvency would be considered assuming the insurer remained in operation, collecting premiums and paying benefits, until all existing policies had expired or matured and obligations under those policies had been settled.

  For some lines of business, such as life insurance, the run-off of business could take many years.

- **Break-up or winding-up**. In these circumstances, the insurer not only would stop writing new business but also its existing obligations would either be settled or transferred to another insurer as soon as possible. A supervisor's interest in break-up or wind-up solvency will likely be greater than that of an insurer's shareholders, board of directors, and senior management, who typically are more oriented toward a going concern perspective. In these cases, supervisors' obligations toward policyholder protection become important.

- **Merger.** A special case of a breakup situation is when two insurers merger. Either one insurer into the other or both into a third entity. In these circumstances, there is a desire to transfer business as quickly as possible. There is also a risk that the insurers' shareholders, boards of directors and senior management may be distracted from policyholder considerations. In these cases, supervisors' obligations toward policyholder protection become important.

In each of these cases, the purpose of solvency assessments may be different as there are different circumstances and expectations involved.

1.1.4 A definition

We now pull the above discussion together.

- **Solvency** is the ability of an insurer to fully meet its obligations (liabilities) to policyholders as they fall due (in the future).
- **Supervisory solvency** is achieved, at a point in time, if the supervisor has sufficient confidence that an insurer will continuously remain viable, for the purpose of the solvency assessment, for specified length of time into the future.

  This requires that the **level of confidence**, the **time horizons** and the **purpose** of the solvency assessment must be defined.
- An assessment of supervisory solvency needs to address many aspects of the insurer and its business.
  - **Capital adequacy.** Are adequate financial resources held? This is as assessed by determining if the insurer is capital adequate that is, continuously expected to meet supervisory capital requirements. This includes, amongst other things, assessment of an insurer's technical provisions.
  - **Liquidity.** Is there adequate liquidity to fully meet its obligations in timely and appropriate way?
  - **Corporate governance.** Are the qualitative requirements of good corporate governance in place? This includes matters such as corporate culture and incentives.
  - **Risk management.** Are the qualitative and quantitative requirements for effective enterprise risk management in place? This includes having the appropriate compliance and control functions in place.
  - Other requirements as specified by the supervisor or in legislation.

When an insurer fails to meet one or more of the supervisor's solvency assessment requirements, it becomes insolvent from the perspective of the supervisor.

We emphasise that this may not mean that the common meaning of solvency (cash flow solvent) is breached. Rather, it means that, over a specified time period, and for specified purpose, the supervisor does not have sufficient confidence the insurer will be able to continuously meet all its obligations in a full and timely way. We acknowledge that over time this may still lead to loss of value and unmet expectations of policyholders (and perhaps other stakeholders)

As a shorthand, the following definition of (supervisory) solvency can be used:

> *Solvency is the ability of an insurer to meet its obligations (liabilities) to policyholders as they fall due. Solvency includes capital adequacy but also involves other aspects of a solvency regime, for example, technical provisions, qualitative aspects (such as would be addressed in an enterprise risk management framework), supervisory review and reporting.*

The reader should be careful to retain a clear awareness of the point discussed above but not explicitly mentioned.

Supervisors monitor the solvency of insurers so they can get early warning of risks to (supervisory) solvency and then take appropriate actions. As the risk of breaching a solvency requirement increases, the challenges the supervisor faces may increase. A key indicator of increasing risk is financial weakness. However, other indicators, perhaps less quantifiable, are also important to support a supervisor forming a balanced view. It is not uncommon for insurers that become (supervisorily) insolvent to still meet capital adequacy requirements when they become insolvent.

Initial actions are likely to be remedial, with the insurer continuing in business and (hopefully) recovering. Actions that are more serious may be needed if the insurer cannot continue in business and needs to be wound up and resolution activities are required. Other modules and ICPs address these matters.

It is implicitly assumed above that the supervisor has the capacity to effectively conduct supervisory reviews and assessments. How supervisory reporting and assessments, for solvency and other matters, should be conducted is discussed in other modules and ICPs.

Although not specifically discussed, we note that if an insurer is part of a group, then the solvency of the group is a different matter to the solvency of each of the individual components of the group. These issues are addressed in other modules and ICPs. This module focuses primarily on a single insurer.

1.2 Solvency is challenging

Solvency not only is difficult to define but also can be difficult to maintain. Often, the solvency difficulties could be traced back to internal causes such as problems with management, shareholders, or other external controllers of the insurers. The problems may include incompetence, operating outside areas of expertise, lack of integrity or conflicting objectives, or weakness in the face of inappropriate group decisions. These internal weaknesses can lead to inadequate decision-making processes, internal controls, and risk decisions that, in turn, leave the insurers vulnerable to external "trigger events." Case study 1 provides examples of problems encountered by insurers in this regard. Clearly, good governance and risk management are essential to the maintenance of solvency.

However, the vulnerability of insurers to financial difficulties can be reduced by ensuring that asset cash flows are available to meet liabilities when they come due, for example, through asset–liability management (ALM) and liquidity management; and by maintaining a safety margin of assets over liabilities. Such a safety margin is provided by an insurer's capital.

1.3 The supervisors role

A fundamental objective of insurance supervision is protecting the interests of current and prospective policyholders. If they are to be protected, insurers must be able to make good on their promises. Those that become insolvent quite likely will be unable to meet their obligations in full and on time. Accordingly, solvency typically is a major focus of insurance legislation, regulation, and supervision.

1.4 The need for capital

What is capital? The IAIS Glossary defines capital as the financial resources of an insurer.

Capital serves as a cushion against adverse experience and financial fluctuations, helping an insurer to maintain solvency while it deals with the many risks to which it is subject. The manner in which capital adequacy requirements can recognise these risks, which may be categorised as underwriting, credit, market, operational, and liquidity risk), is discussed in section 3. Many of these risks arise from the risk-taking and financial intermediation aspects of the insurance business itself.

However, capital is also essential in enabling insurers to meet the types of strategic and operational needs that it shares with any business. A new insurer needs cash, sometimes referred to as working capital, to finance its start-up expenses. Established insurers need capital to finance the expenses of, and provide a buffer against the risks posed by, diversification into new products, market segments, or geographic territories. As a company's business grows, the amount of capital needed to provide an adequate safety margin also will grow, although perhaps less than proportionally, if the company is successful in diversifying its risks. At the same time, however, the costs of acquiring new business, particularly in the case of life insurance, may depress an insurer's profits or even create losses, when the business is taken on (this may be despite the business being expected to make profits over the lifetime of the policies). In addition, the nature of long-term life insurance contracts with relatively high initial expenses can imply that it may take a number of years before a new company starts reporting overall profits.

In light of the fiduciary nature of the insurance business, a strong capital position can increase the confidence of current or prospective policyholders that an insurer will be able to meet its obligations to them. In fact, some insurance consumers, for example, large corporations or insurers seeking reinsurance, may refuse to do business with insurers that lack enough capital

to qualify for a high rating from a rating agency. Viewed from a broader perspective, an insurance sector comprised of well-capitalised companies contributes to public confidence and the effective functioning of the insurance market.

Thus, the existence of capital may provide a number of benefits beyond keeping an insurer financially solvent. Determining how much capital will be adequate to respond to these various needs can be a complicated process, and, to some extent, a judgment call. The topic will be further explored in section 3.

1.5 Sources of capital

Adequate capital, however it may be defined and determined, is essential to an insurer.

There are a number of possible sources of capital for an insurer, the relevance of each to a particular insurer will depend on such factors as its corporate legal form, who owns it, its stage of development, and its financial position and performance.

Many insurers are constituted as shareholder-owned corporations. The initial capital for such an insurer is obtained by issuing and selling common shares (stock), which provide their purchasers with shares in the ownership of the insurer. Shareholders make this investment in the expectation that the insurer will be successful, that is, profitable and growing. Shareholders may then benefit through the distribution of a portion of these profits to them as dividends, through their ability to sell their shares at a higher price, or both. A shareholder-owned corporation may be either widely held, that is having many shareholders, or closely held with few shareholders. For example, the shares of an insurer that is part of a financial conglomerate may be wholly owned by its corporate parent.

Some insurers, for example, mutuals, friendly societies, and cooperatives, have no shareholders but are owned by some or all of their policyholders. The initial capital for such insurers is obtained from a founding group of policyholders. While their initial capital contributions will be returned to them once the insurer becomes well established, their claim against the insurer is not a transferable right of ownership that can be sold to a third party, such as that of a shareholder in a shareholder-owned insurer.

Finally, some insurers may be state-owned. In such cases, their initial capital is obtained from the government.

Once an insurer is through its start-up period, its primary source of capital typically will be retained earnings. Retained earnings are the profits that have been earned by the insurer but have not been distributed to policyholders or shareholders. Both shareholder-owned and policyholder-owned insurers may, depending on their licensing requirements, issue participating or with-profits policies, which provide for sharing the insurer's profits with the policyholders. In the case of policyholder-owned insurers, such policies also confer rights of

ownership, such as the right to elect directors to the board. As mentioned above, shareholders expect to share in the insurer's profits, and the board of a profitable shareholder-owned insurer would typically declare dividends payable to shareholders. However, the board of directors of any type of insurer will usually decide to retain a portion of its profits to expand its capital base.

If an insurer is growing rapidly or has adverse experience, it may need more capital than can be generated, at least in the short term, by profits on its existing policies. Shareholder-owned insurers may be able to raise additional capital by selling more shares to either existing shareholders or new investors. If the insurer is closely held, it most often will look to existing shareholders for additional capital. Additionally, as discussed in section 2, some of the capital raised may be in forms other than common shares, for example, preference shares. In any case, the willingness of investors to provide capital and the terms on which they are prepared to do so will depend on their assessment of the insurer's future prospects.

Policyholder-owned (often referred to as mutual) insurers are at a distinct disadvantage when it comes to raising capital, as they are unable to sell shares to investors. To overcome this constraint on their ability to grow and compete effectively, many mutual insurers have in recent years converted to shareholder-owned insurers, that is demutualised. In a demutualisation, participating policyholders receive shares or cash in exchange for the company ownership rights inherent in their policies. Subsequently, the demutualised insurer can raise capital in the same manner as any other shareholder-owned insurer.

Another technique used by insurers to cope with a shortfall in capital is to reinsure some of their business. Some of the risk is assumed by the reinsurer, thereby reducing the amount of capital needed by the insurer as a safety margin. Reinsurance arrangements might also be structured to provide for the upfront payment by the reinsurer of some of the expected future profits of the business reinsured (financial reinsurance), thereby providing the insurer with immediate additional capital.

An insurer might also decide to borrow money to help meet its needs, for example, by obtaining a loan or by issuing bonds. However, since borrowed money must be repaid together with interest, supervisors normally do not treat it as an eligible capital element. Section 2 includes a discussion of the criteria that might be applied to determine the suitability of different forms of capital.

1.6 Terms used

Many of the insurance related terms used in this module are defined in the IAIS Glossary of Terms (see www.iaisweb.org). When additional terms are used, they are defined in the text.

The terms regulation and supervision are often used interchangeably, but they mean different things. In this module, regulators establish "the rules of the game," such as regulations and

guidelines related to an Insurance Act (or Acts). Supervisors are the "referees" whose role is to oversee that these rules are complied with and deal with the consequences of non-compliance. This requires supervisors to apply judgment when making determinations and decisions. Understanding the difference between the regulation and supervision is important when allocating of responsibilities between regulators and supervisors, especially when they are different agencies.

In this module "supervisor" is used to include both regulators and supervisors. The module also assumes that supervisors are insurance supervisors. Supervisors, as determined by the context of the particular use, may be either the individuals working for a supervisory agency or authority or the authority itself.

While the terms used in this module are suitable for the purposes of this module, it may be that in specific real situations, more detailed definitions or explanations are necessary. These more detailed definitions may also vary between jurisdictions.

Some terms may not have unique meanings, and definitions contained in various sources may differ. To avoid ambiguity and reduce the risk of misuse and misinterpretation, readers should take care to be comfortable they are clear on the definitions of the terms used.

Exercises – Section 1

Answer the following questions considering, where indicated, the practices in your jurisdiction. If you are working with others on this module, develop the answers through discussion and cooperative work methods.

Ex 1 How might the interests of an insurer's board and senior management in solvency coincide with those of the supervisor? How might they differ?

Ex 2 Consider the most recent instances of insurers in your jurisdiction raising additional capital. Why did they do so? What were its sources?

Ex 3 There is a trend toward broadening solvency regimes to include elements such as risk management and disclosure requirements. Comment on the presence and relative effectiveness of quantitative and qualitative elements in your jurisdiction's solvency regime.

2 Elements of a solvency regime

2.1 Overview

ICPs are principles based and prescribe the essential elements that must be present in a supervisory regime. The objective is to promote a financially sound insurance sector and provide an adequate level of policyholder protection. The next level after ICPs are standards that are linked to specific ICPs and set out high level requirements that are fundamental to the implementation of the ICPs.

Essential elements of a solvency regime include:

- Valuation of liabilities, including technical provisions and the margins contained therein
- Quality, liquidity and valuation of assets
- Matching of assets and liabilities
- Suitable forms of capital
- Capital adequacy requirements. and
- Group supervision

In section 2, each of these elements will be examined in turn, with the exception of capital adequacy requirements (see section 3). Before doing so, it is important to note that while these largely quantitative elements are necessary, their existence alone will not necessarily ensure solvency.

The board of directors and senior management of an insurer are responsible for its prudent operation and, therefore, must take primary responsibility for ensuring its solvency. They need to recognise the range of risks that the insurer faces and manage them effectively. Both the insurers and their supervisors need to understand that not all risks can be mitigated solely with capital. For example, capital can provide an effective safety margin against adverse claims experience on a portfolio of insurance policies that has been prudently designed, adequately priced, carefully underwritten, and appropriately protected by reinsurance. However, weaknesses in any one of these areas might make it impossible, or at the very least economically unfeasible, to maintain enough capital to provide an effective safety margin. Taken to an extreme, consider how much capital might be needed to secure the solvency of a small insurer that operates in a coastal region prone to hurricanes, writes only property insurance on large risks, applies limited underwriting, and has purchased no reinsurance coverage.

There is a need for various stakeholders of an insurer, such as investors, creditors, policyholders, and intermediaries to have access to information on the risks it has undertaken

and its financial capacity to bear these risks. Such disclosure by insurers enables markets to act efficiently, and the discipline it engenders serves as an adjunct to supervision.

Supervisors and others have responded to these issues by recognising that capital adequacy and other quantitative requirements should be integrated into broader solvency regimes. For example, EU Solvency II, various IAA publications, and the Basel II Capital Accord for banks each identify quantitative capital adequacy requirements, supervisory assessment of risk management, and disclosure of information as key elements, or pillars, of a broader solvency regime. The relative emphasis on each of these elements may vary by jurisdiction, reflecting differences in such things as supervisory philosophy, market development, and technical capabilities of the insurers. For example, supervisory assessment of risk management might be emphasised in a jurisdiction in which relatively little statistical information exists to support the development of risk weights for a capital adequacy test and few of the insurers are widely held, that is, accustomed to providing extensive public disclosures.

2.2 Liabilities and assets

Solvency is fundamentally an assessment of an insurer's current and, perhaps, prospective, balance sheet. Therefore, it is impossible to make an adequate assessment of solvency unless the liabilities and assets in the balance sheet are valued appropriately. While opinions may differ on what is "appropriate," a coherent solvency regime cannot exist in the absence of reliable and reasonably consistent bases of asset and liability valuation. It is worth noting that many exposures may exist that do not show up on the balance sheet such as high limit policies, large catastrophe exposures, or other concentrations of risk from future events.

To the extent possible, the valuation bases should provide a clear picture of insurers' financial situations, reflecting their economic viability. Distortions should be avoided, as should volatility that is unrelated to the true economics of the business. For example, if assets are valued at historical cost but liabilities are valued based on current market conditions, an insurer's financial results could well be both volatile and distorted. The valuation bases should not only produce results that are comparable from one period to the next for any particular insurer but also facilitate comparisons of one insurer to another.

Supervisors have responded to these measurement challenges in various ways. In some jurisdictions, accounting and actuarial standards provide the bases for the valuations used for both shareholder and supervisory reporting purposes. In other jurisdictions, insurance supervisors specify the valuation bases to be used for reporting to the supervisor, which may differ from that used for shareholder reporting. Still others take intermediate approaches, such as requiring specific adjustments to the valuation bases used for shareholder reporting. Regardless of the approach taken, it is essential that the solvency regime be sensitive to the valuation and accounting requirements that apply to the insurers.

2.2.1 Technical provisions

Technical provisions are the liabilities on an insurer's balance sheet due to its obligations arising out of insurance contracts. Since technical provisions typically account for the vast majority of an insurer's liabilities, it is essential that these provisions adequately reflect these obligations. The ICPs require supervisors to establish procedures for assessing the valuation of assets, non-policyholder liabilities and technical provisions. Insurers should comply with these standards for establishing technical provisions, assessing their adequacy, and increasing them if necessary. Supervisors usually also have the power to require insurer's to increase any and all of the items listed here if they deem it necessary.

Technical provisions, particularly those of life insurers, are often calculated by actuaries. The techniques for doing so are varied and sometimes complex. Regardless of the techniques employed, to the extent possible, technical provisions should reflect all of the risks related to the policies written by the insurer. They should be sufficient to cover not only claims and other policy benefits but also any related administration expenses, taxes, embedded options, and policyholder dividends or bonuses, as well as required margins.

Since the technical provisions are only estimates of an insurer's ultimate obligations under its policies, whether or not these estimates are adequate can only be known in retrospect, once the obligations have been settled. However, the ICPs give some guidance, saying that technical provisions plus supervisory capital requirements should be sufficient to ensure that policy obligations are satisfied with the probability of sufficiency required by the supervisor. This means that some margin for adverse experience should be included in the technical provisions.

Unsurprisingly, the supervisors, actuaries, and accountants in various jurisdictions have different ideas about how much margin there should be and how it should be calculated. For example, in some jurisdictions, technical provisions are calculated using assumptions that are best estimates plus explicit margins for adverse deviation in each assumption; the actuarial profession provides guidance on the size of these margins. In other jurisdictions, supervisors may limit or specify values for particular assumptions, which, although sometimes intended to be quite conservative, generally do not facilitate identification of the amount of the margin. Finally, some jurisdictions, have begun to explicitly state that the level of the margin should be to provide a particular level of confidence that the technical provisions will be adequate, as determined through stochastic modelling of multiple scenarios. It is important that the method being used should be appropriate to the complexity of the markets and environment in the relevant each jurisdiction.

It is important that capital adequacy requirements be sensitive to the level of margin in the technical provisions and how it may, or may not, change in response to changes in economic conditions and other factors. All else being equal, the supervisor in a jurisdiction in which the technical provisions include explicit margins that vary in accordance with changing conditions

may require its insurers to maintain less capital than the supervisor in a jurisdiction that specifies particular assumptions, whose initial conservatism may erode as conditions change.

2.2.2 Other liabilities

An insurer, like any other business, will have liabilities apart from its obligations under insurance contracts. These liabilities may include amounts borrowed from banks, equipment leases, accrued wages of its employees, pension obligations to both retired and currently active employees, taxes payable, accrued interest, and contingent obligations under derivative contracts. Typically, insurers will account for such liabilities in the same manner as other businesses in their jurisdiction.

Supervisors need to understand how such liabilities are being accounted for by insurers and ensure that the provisions established are adequate. Furthermore, when designing and enforcing a solvency regime, it is essential that supervisors understand the relative legal priority of liabilities to policyholders and those to other parties in the case of insolvency. In recognition of the fiduciary nature of the insurance business, insurance laws in many jurisdictions rank obligations to policyholders above some, but not necessarily all, other liabilities of an insolvent insurer. Furthermore, many jurisdictions also enforce separate policyholder and shareholder funds that can improve security for policyholders, especially for investments and savings of policyholders.

2.2.3 Assets

It is important that assets be realisable to meet obligations to policyholders at any time. Therefore, solvency regimes must address the quality, liquidity, and valuation of assets.

A diversified portfolio of high-quality assets is more likely to maintain its value than one whose assets are speculative in nature. Accordingly, solvency regimes typically include restrictions on the types and mix of assets in which insurers may invest. As discussed in section 3, risk-based capital adequacy requirements also provide an incentive to invest in high quality assets by requiring insurers to hold less capital as a margin against potential losses on such assets than on lower quality assets. Since the amount and timing of obligations to policyholders are seldom certain and, in fact, may fluctuate significantly, insurers need to maintain enough cash or liquid assets to meet these obligations on short notice. Liquid assets are those that can be quickly converted to cash in an amount equal or very close to their value on the insurer's books. In normal circumstances, cash flows from premium payments and interest on invested assets often are sufficient to enable an insurer to meet its obligations, without the need to realise any assets. However, insufficient liquidity to cope with abnormal circumstances can lead an insurer to solvency difficulties. See case study 1 for an example.

Appropriate valuation of assets is also essential to the determination of an insurer's solvency. Investments must be valued according to a method prescribed by or acceptable to the supervisor. Valuation methods should be prudent, transparent, objective as possible, and produce consistent results. Some assets can easily be valued, for example, cash, government bonds, and shares that are regularly traded on an established exchange. The valuation of other assets may be more complex or subjective, for example, real estate, which may require periodic assessment by experts; and "over the counter" derivatives, which may require the use of models.

To provide greater assurance that the asset values in insurers' balance sheets are prudent, some solvency regimes incorporate mechanisms for deferring recognition of increases in the values of certain assets. For example, increases in the market values of investments in common shares might not be reflected in the balance sheet until the shares are sold, or only a portion of the previously unrecognised increases might be recognised each year. On the other hand, assets that have declined in value, perhaps due to the financial troubles of their issuers, might have to be held at their reduced market values, which are all that could be realised if the insurer were to become insolvent.

The values of some types of assets may diminish, or even vanish, in situations of stress or insolvency. For example, an insurer that has had some unprofitable years may be entitled to apply its losses against future years' profits, thereby reducing or eliminating the taxes payable on those profits. The insurer may carry an asset on its balance sheet in respect of this entitlement. However, if the insurer becomes insolvent, there is no prospect of future profits or tax savings, thereby rendering this asset worthless unless, perhaps, the insolvent insurer can be merged with a profitable one. Other assets that might be of limited value in meeting policyholder obligations in the event of insolvency include the furniture and equipment used by an insurer in its operations, amounts due from insurance intermediaries, and investments in subsidiaries or affiliated companies. Not only are these assets illiquid, but also enforcing the repayment of such amounts in an insolvency situation would likely be very difficult, if not impossible.

Solvency regimes respond to this risk in various ways. One approach is to disallow certain assets entirely, either on the balance sheet that insurers submit to the supervisor or for purposes of the capital adequacy test. In this case such assets are often called non-admitted or inadmissable. Another approach is to limit the recognition of such assets, for example, by ignoring the portion of their value in excess of a defined percentage of the insurer's assets or by recognising only a certain percentage of their value, sometimes known as "haircutting". Yet another technique is to apply a high-risk weight to such assets when calculating required capital under a risk-based capital adequacy test.

2.3 Case study 1. Liquidity crisis

In 1999, an American insurer's credit rating was downgraded by a major rating agency. Shortly thereafter, many investors invoked the seven-day redemption clause in the short-term funding agreements issued by the insurer. Although these agreements suddenly behaved like short-term liabilities, the supporting assets were invested for longer terms.

The insurer was unable to sell assets quickly enough to meet the redemption requests. The combination of a mismatch in the terms of the liabilities and assets and the rating downgrade led to a liquidity crisis, causing the insurer to voluntarily seek state insurance department supervision.

2.3.1 Asset–liability management

As case study 1 demonstrates, a mismatch between the term of an insurer's liabilities and that of its assets can create liquidity problems that are serious enough to threaten its solvency. However, the need for an insurer to align its assets with its liabilities is important for more reasons than just ensuring adequate liquidity. An insurer's results can be subject to adverse fluctuations or trends, perhaps threatening its solvency, if its assets and liabilities are mismatched in terms of currency or the timing or amount of the cash flows. The risks may be particularly high in the case of long-term life insurance, annuity, or savings products that provide various guarantees or embedded options.

Solvency regimes need to address the matching of assets and liabilities. One way to do this is to require that insurers develop and implement programs of asset–liability management (ALM). ALM is the practice of managing a business so that decisions and actions taken with respect to assets and liabilities are coordinated. This is done through an ongoing process of formulating, implementing, monitoring and revising strategies related to assets and liabilities to achieve an organisation's financial objectives, given the organisation's risk tolerances and other constraints. ALM is relevant to, and critical for, the sound management of the finances of any organisation that invests to meet its future cash flow needs and capital requirements.

A wide range of techniques can be used in an ALM program, for example, stochastic modelling of asset and liability cash flows, Value at Risk (VaR) calculations, and hedging with derivatives. A more substantive discussion of ALM is beyond the scope of this module.

The mitigating influence of a well-executed program of ALM might be explicitly recognised in a solvency regime. For example, a supervisor may require life insurers to hold an amount of capital in respect of the assets backing index-linked products in inverse relation to the correlation between the rates of return credited to policyholders' funds and the returns earned on the underlying assets. For example, if the returns are shown to be perfectly correlated, this component of required capital may be nil. If the returns are only 85 percent correlated, required capital may be 15 percent of assets.

2.3.2 Reinsurance

Any allowance for risk mitigation or transfer should consider both its effectiveness and the security of any counterparty. Reinsurance is one of the techniques most commonly used by insurers to mitigate or transfer some of the risk that they have assumed. Its use has a number of implications that must be addressed by a solvency regime.

It is important to note that the purchase of reinsurance protection does not extinguish or diminish an insurer's ultimate obligations to its policyholders. Insurers enter into reinsurance arrangements with the expectation that their reinsurers will make good on their own obligations when they come due. While this expectation usually manifests, it is not a certainty. For example, a reinsurer may become insolvent or an insurer may have entered into an agreement with a disreputable reinsurer that refuses to pay claims promptly or in full. In the case of such a default, the insurer must nevertheless meet its obligations to policyholders out of its own resources.

For this reason, solvency regimes seek to limit this reinsurance counterparty credit risk in various ways. One way is to encourage insurers to deal with reputable, financially strong reinsurers. Insurers should be expected to perform due diligence on prospective reinsurers before entering into agreements with them. Some jurisdictions license and supervise reinsurers and may not allow insurers to deal with unlicensed reinsurers or, if such dealings are allowed, to take credit on their balance sheet for amounts due from unlicensed reinsurers. Others may apply "haircuts" to the credits that may be taken for amounts due from reinsurers that have lower ratings from ratings agencies, or allow credits only if the reinsurer posts collateral in a trust. Some jurisdictions establish limits to prevent excessive concentration of an insurer's reinsurance program with a single reinsurer.

Credits for reinsurance on an insurer's balance sheet may take the form of assets, for example, amounts receivable from reinsurers; or of reductions in liabilities, for example, lowering the technical provisions in proportion to the amount of coverage purchased. The precise treatment will depend on the accounting standards applied in the jurisdiction, perhaps supplemented by supervisory requirements.

The above discussion of taking credit for reinsurance on the balance sheet is premised on the assumption that there has actually been a meaningful transfer of risk from the insurer to the reinsurer. This assumption may not always be valid. Some reinsurance arrangements, for example, financial reinsurance, are designed primarily to assist insurers in meeting prudential requirements with little or no transfer of risk. Solvency regimes may include criteria for assessing the effectiveness of the risk transfer and provide no balance sheet credit unless the criteria have been met. Supervisors may need to review not only the financial records of a reinsurance arrangement but also the reinsurance contract itself—along with any "side letters" that may exist—to make such an assessment.

2.4 Capital

Finally, before turning to a discussion of how much capital might be required, it will be useful to consider what forms of capital might be suitable to meet such requirements and how the amount of capital available might be measured.

From a simple accounting perspective, the amount of capital available might be calculated by taking the arithmetic difference between an insurer's assets and its liabilities. This measurement will obviously be affected by the ways these elements of the balance sheet have been valued. As noted above, the valuation bases vary from jurisdiction to jurisdiction, reflecting differences in accounting and actuarial standards and supervisory requirements. For example, in one jurisdiction, assets may be valued using current market values, while in another jurisdiction they are valued at historical cost. In either case, there may or may not be a mechanism for smoothing the changes in reported values. To the extent that the reported values of assets or liabilities differ from best estimate or fair market values, "hidden reserves" are created; such reserves may be positive or negative.

Within a particular jurisdiction, the valuation bases may also vary from insurer to insurer, although hopefully not too much, reflecting the choices each insurer has made within the confines of the local regime. One insurer may follow an aggressive accounting approach to show more favourable financial results by, for example, minimising the margins in its technical provisions and seeking optimistic appraisals of its real estate investments. Another insurer may elect to include extra margins in its technical provisions and use conservative appraisers in valuing its real estate.

The foregoing highlights the need for supervisors to be fully aware of the valuation and accounting practices being applied by insurers when examining their reported capital. Such awareness may be especially challenging when the examination involves the financial reporting done in the context of another jurisdiction's requirements. However, simple balance sheet comparisons can easily lead to inappropriate conclusions.

Another way to look at capital is to consider the sources of an insurer's assets and the nature of any claims against those assets. Predominantly, insurers' assets come from the premiums paid by policyholders and the returns earned through the investment of those premiums prior to the payment of policy benefits. Likewise, the claims against insurers' assets consist primarily of its obligations to policyholders. However, as mentioned in section 1, some assets come from sources other than policyholders, for example, the sale of shares. Other assets may arise from policyholders, but exceed the remaining obligation to them, that is, retained earnings. From this perspective, capital can be viewed as the claims against an insurer's net assets, roughly, assets minus technical provisions and other liabilities. Capital instruments define the nature of those claims.

The capital shown on an insurer's balance sheet may represent either equity claims or debt claims. Equity claims are defined by instruments such as shares of stock, contribution certificates in respect of the initial capital of a mutual insurer, and participating policies. Debt claims are defined by instruments such as bonds or commercial paper. The precise nature of the claims evidenced by these instruments must be evaluated in determining whether the corresponding amounts of reported capital are of suitable quality to be recognised in the context of a solvency regime.

Solvency regimes should either clearly define the forms of capital that will be recognised as suitable or set out criteria that can be used to assess the suitability of particular capital instruments.

Solvency regimes deal with any differences in the potential capital elements' availability to cover unexpected losses and their permanence in various manners. Some jurisdictions define one or more categories, or tiers, of capital quality. For example, tier 1 would consist of the highest quality capital, such as common shares, retained earnings and perpetual non-cumulative preferred shares. Tier 2 capital, which falls short in meeting one or both of the quality criteria but still contributes to the overall financial strength of an insurer, might include goodwill and intangible assets, future income tax credits, and hidden reserves. Whether or not a tiered approach is employed, supervisors will generally specify additions or reductions to reported capital for purposes of assessing capital adequacy, for example, non-admitted assets, reinsurance with unregistered reinsurers, and market value smoothing reserves.

Exercises – Section 2.3

Answer the following questions considering, where indicated, the practices in your jurisdiction. If you are working with others on this module, develop the answers through discussion and cooperative work methods.

Ex 4 In your jurisdiction, who establishes standards for the valuation of the assets and liabilities of insurers that are reported in the financial statements prepared for their shareholders? Are these same values used in the supervisory returns? If not, how do they differ?

Ex 5 Technical provisions may be calculated using assumptions that are intended to be conservative, which method provides implicit margins. Alternatively, they may be calculated using "best estimate" assumptions to which explicit margins are added. What are the advantages and disadvantages of each in the context of establishing solvency requirements? Which approach to calculating technical provisions is used in your jurisdiction?

Ex 6	What are some of the ALM techniques used by insurers in your jurisdiction? How does your solvency regime recognise the presence or absence of ALM?
Ex 7	Solvency regimes sometimes seek to limit reinsurance counterparty risk by allowing insurers to take credit on their balance sheets only for reinsurance with highly rated reinsurers. However, if few highly rated reinsurers are operating in a jurisdiction, insurers that want to obtain credit may be subject to concentration risk. How might a solvency regime address this dilemma? What approach is used in your jurisdiction?
Ex 8	What forms of capital are recognised for supervisory purposes in your jurisdiction? How does supervisory capital in your jurisdiction differ from the result of simply subtracting an insurer's liabilities from its assets?
Ex 9	The highest quality capital is both presently available and permanent. To what extent would you consider each of the elements of capital recognised for supervisory purposes in your jurisdiction to be presently available? To what extent is each permanent?

3 Capital adequacy

Capital adequacy is a concept that considers the interaction of the available resources and compares them to the potential for an adverse outcome that may erode these resources. To the extent that an insurer has sufficient resources to withstand a particular adverse event, it would be "capitalised adequately" if that event happens. The difficulty, however, is that there are many potential adverse events, and they have different likelihoods of occurring and different magnitudes of effects when they do occur. Furthermore, more than one adverse event may occur at the same time; they may be linked in cause and effect creating a correlation effect; or they may magnify or reduce the size of the resources required to withstand them if they occur together rather than separately.

The ICPs indicate that an insurer should be able to recognise, measure, manage, and mitigate the risks that it faces. Capital is one way of providing resources against such risks and is, therefore, a form of risk mitigation. Other forms of risk mitigation include reinsurance and underwriting controls. The regulation of capital has two basic objectives. The first is to provide a minimum level of resources considered prudent for supervisory purposes. This requirement can provide an element of capital over and above that considered necessary by the company itself to meet its business needs. The second is to provide a trigger for intervention.

The IAIS has established a number of features of a solvency regime. These are discussed above. Using the minimum solvency margin as a measure of the capital adequacy of an insurer means that it should be a measure of the level of risk that the company is carrying. It is not possible to have a perfect measure under any circumstance. The best measurements require considerable data collection and information, something usually practical only in the company itself. Therefore, the minimum solvency margin necessarily must be an approximation and be capable of broad, practical application.

The ICPs note that it is useful to establish solvency control levels above the minimum solvency margin. As such, the validity of a point of intervention at, for example, 1.5 times the minimum solvency margin will represent different levels of risk for different companies. This distinction will be more consistent if the solvency margin itself reasonably approximates, or follows in broad terms at least, the level of risk in the company itself.

This section considers the nature of risk, the relevance of capital as a risk mitigation tool, sample structures for a solvency margin, and the use of control levels and stress tests as tools for greater resilience. It briefly comments on issues relating to branches and insurers that are part of conglomerates.

3.1 Risks mitigated by capital

There are many ways to break down the various risks that are faced by insurers and other financial institutions. Several risk taxonomies have been published. The differences among them tend to reflect the preferences of those who prepared them and the level of detail at which individual risks are identified. This module outlines a relatively simple taxonomy.

Ultimately, risk is considered as the potential for variability in outcome, particularly adverse outcomes. If a particular outcome is known with certainty, there is no risk. In reality, even in cases in which the certainty is high, it is rare that a business operation of any sort does not face some uncertainty of outcome. For example, if an enterprise holds notes and coins as an asset, it may feel that their value is certain. However, the value may be reduced in the case of losses due to inadequate storage, misadventure, or theft when insufficiently insured.

More practically, in the case of an insurer, consider the liability side of the balance sheet. The majority of the liabilities consist of provisions for obligations under insurance policies. Depending on the types of insurance, the outcome in terms of claims and their cost will be more or less certain. For non-life insurance policies, both the likelihood of a claim and its size are usually uncertain, whereas the timing of life insurance claims is always uncertain even if the amount of the payment is defined in the contract.

The uncertainty in the financial outcome of an insurance portfolio often is referred to as "technical risk" or "underwriting risk." Such risk relates to the uncertainty of the outcomes in policies, whether they are in force or have expired but for which claims either remain outstanding or could still be reported.

Considering the assets in which an insurer invests, the risks are similar to those faced by other investors.

- *Credit risk* generally refers to the potential that a counterparty may, by choice or inability, fail to repay its commitments to an investor.
- *Concentration risk* reflects the level of exposure to a single counterparty and should consider all types of commitments made from the counterparty together.
- *Liquidity risk* is the risk that an insurer will be unable to realise the value of an investment in a timely manner consistent with its needs.
- *Market risk* reflects the possibility that, even if an asset may be able to be realised, its value may have fluctuated adversely.

As discussed in section 2, for many types of risks that insurance face, it is possible to manage the assets and the liabilities so that fluctuations on the asset side of the balance sheet are matched by fluctuations on the liability side. However, this ideal is not always possible. The

extent to which risk may arise from mismatching should be considered in the capital adequacy requirements.

Efforts to measure most of these risks have led to a desire to apply risk mitigation techniques. A particular risk mitigation technique for insurers is to take out reinsurance, that is, transfer the risk to another party. However, transfer risk can lead to its own risk, because the mitigation may not be perfect. For example, if the definition of claims in the reinsurance policy differs from the definition in the insurance policies issued by the company, the cover may not be perfect in all circumstances. This discrepancy is referred to as basis risk, because the reinsurance claims are paid on a different basis than that of claims under the reinsured policies. Reinsurance also introduces counterparty risk as the insurer is dependent on the reinsurer being willing and able to pay its share of claims as they fall due".

Conventional wisdom has been that liquidity risk should not be a major concern for insurers. Normally, premiums exceed claim payments, and insurers are net investors. Similarly, if claims were to increase sharply, insurers can usually find mechanisms to make the payments progressively to avoid distress. In some cases, these mechanisms can include invoking clauses in contracts that enable the deferred payment of surrender values, or recognising that insurers do not have funds on call from the customer in the same way that a bank would or even paying claims by transferring the underlying assets rather than cash. Nevertheless, liquidity risk can have a significant impact on an insurer. See case study 1. In the event of an adverse outcome, the additional financial resources of capital can be available to meet most risks. However, the extent to which these resources can assist in dealing with a liquidity problem depends on whether these additional assets themselves are liquid. Recognising the difficulties inherent in quantifying liquidity risk, it is advisable that solvency implications be addressed through supervisory assessment rather than through quantitative capital adequacy requirements.

One additional risk that increasingly has been recognised is operational risk. This risk often is defined as "all other risks" but may be defined more explicitly. In particular, operational risk focuses on the adversity that can result from failures in the operations of the company. Examples of operational risk include a breakdown of procedures, failures in management, computer failure, poor recordkeeping, events that make it impossible for the insurer to operate from its regular offices, or even fraud. Operational risks vary widely and may be difficult to anticipate. While capital can mitigate operational risk, this type of risk also must be addressed effectively through good corporate governance, internal controls, and risk management practices.

Usually, consistent with the ICPs and principles on capital adequacy and solvency, there is a fixed minimum level of capital or solvency margin. The reason is that, regardless of the size of the insurer, some risks exist, and new insurers face particular risks. These challenges include difficulties in managing a start-up operation that do not exist in an ongoing business. An example would be not having adequate existing data to estimate the claims experience from

policies, compared to an established company that has good data. In addition, to quickly build their book of business to a viable size, new insurers may tend to accept riskier or less profitable business that an established company would pass up.

Absolute minimums also ensure that only operations of some substance are permitted to enter the insurance market. This standard is important in light of the unique nature of insurance, which requires an insurer to deliver on long-term and important promises.

3.2 Minimum requirements

Minimum solvency requirements must be clearly defined. The reason is that they identify the point at which final intervention occurs, that is, when the supervisor takes over the company and relieves senior management and owners of their rights. A requirement that is open to interpretation can hold up intervention in legal disputes. Such disputes can impede the important need to protect the interests of the policyholders. Thus, the minimum solvency requirement is usually defined in terms that enable it to be determined more precisely than the assessment of solvency, which is a matter of judgment, would suggest. To achieve more legal certainty, some matters of judgment need to be set aside.

Two main approaches are taken to define the minimum solvency requirement:

- The "index-based" method, and
- The "Risk-Based Capital" (RBC) method.

It is also possible to adopt an approach that reflects a middle ground. However, most jurisdictions are moving towards some form of risk-based capital method.

3.2.1 "Index-based" requirements

While all regimes involve a range of elements, an index-based regime is characterised by a solvency margin that is expressed as the greatest of a range of balance sheet or income statement indexes.

The required solvency margin is based on a relatively simple formula. One part is a minimum capital requirement that uses fractions of various indices of risk exposure. In other words, factors are applied to various figures taken from the balance sheet of the insurer, and the minimum solvency margin is taken to be the greatest of the calculated results.

Certain scale effects can be recognised. In particular, as the portfolio grows, the volatility of total claims in a portfolio of independent or negatively correlated insured risks increases at a slower pace than the average claim. These scale effects are reflected through the application of lower factors for the part of the exposure that exceeds a certain threshold.

The premium index may use gross premium income as a measure of exposure. The average claims cost is defined as the claims incurred, in contrast with claims paid, over the last three years. The various percentages would generally be determined using a mathematical approach called ruin theory. Ruin theory estimates the probability that an insurer will face financial ruin during a time period, taking into account its risk profile and level of solvency margin. The "greater of" the various calculations constitutes the solvency margin requirement.

Risk limitations and the credit given for reinsurance cover are additional features of the system. The effect of reinsurance may be reflected in calculating the required solvency margin. However, the reduction may be limited.

In summary, the index-based method broadly relates risk to various index measures. The larger the premium or the claims provisions, the greater the overall risk that the company is carrying. Some observers argue that this index-based approach has been widely used and has shown relatively good empirical results. However, it focuses on the liability side of the balance sheet and thus does not reflect all the risks faced by an insurer. Others contend that the indexes selected are a proxy for the overall risk of the enterprise. Most major jurisdictions have moved from index-based requirements to risk-based capital requirements, for example Solvency II in Europe.

3.2.2 "Risk-based capital" requirements

Risk-based capital (RBC) solvency regimes attempt to more closely reflect the risks assumed by each insurer in the calculation of its required capital. They use more complex formulas and statistical techniques than those employed in an index-based solvency regime.

These solvency regimes have requirements that cover each risk within a defined taxonomy.

Risk-based capital computations specify the minimum amount of capital required based on a company's size and risk profile. Major risk categories are:

- Asset risk
- Interest rate risk, primarily in life insurance
- Health credit risk, primarily accident and health insurance
- Underwriting risk
- Credit risk, especially with respect to reinsurance, and
- Other business risk.

The computation of RBC includes adjustments for correlation among risks and additional risks inherent in certain types of activity. Reinsurance is subject to specific limits, and the credit provided reflects the ability of the supervisor to recover insurance amounts owed by the reinsurers.

3.2.3 Internal models

A recent development in many jurisdictions is to allow the use of internal models. The benefit of using an internal model is that it more closely reflects the risks to which an insurer is exposed. However, it is costly and very complex, and has proven burdensome to get the model approved for statutory purposes. Additional observations

- Ultimately, a solvency regime is not simply driven by the solvency margin itself. The valuation of the assets and the technical provisions also influence the amount of the solvency margin in the accounts, and the parameters need to consider these elements.
- Actuaries and auditors can play a role in adding credibility to these accounting values in jurisdictions in which their professions are well developed. In other cases, the supervisor may have to make more specific and detailed rules directly on these elements as part of the overall solvency regime.

As shown by the examples in this section, while the structure of the solvency margin formula may differ, it must always be clearly defined. Finally, the solvency regime in every jurisdiction should reflect parameters that consider the risk in that jurisdiction. The adoption of, for example, the EU or US system without consideration of whether the parameters are appropriate in the local context may not result in adequate minimum solvency requirements. If risks are greater, or simply different, it is reasonable to have different parameters. If the accounting rules for the valuation of assets and liabilities or the treatment of reinsurance in the system are different, the resulting level of security provided to policyholders will be different if the same parameters are adopted without considering these differences.

3.3 Providing greater resilience

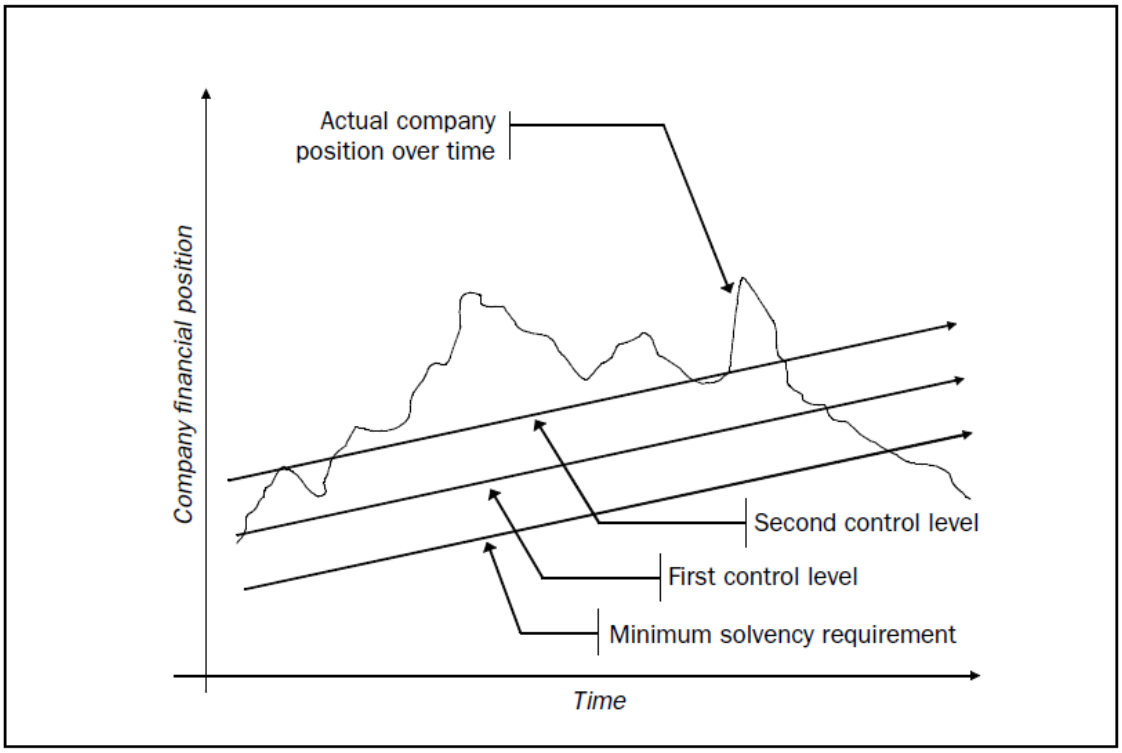
In the early phase of solvency regulation, a single solvency requirement or capital level obligation on an insurer usually was provided in the law. When an insurer fell below this level, the supervisory authorities would intervene to take over the company and take whatever action was necessary and permissible under the law to protect the interests of the policyholders.

More recently, it has been seen as desirable to have "solvency control levels". In effect, the concept of these levels is to reflect the fact that supervision does not stop above the minimum requirement or that the only action available to the supervisor is the final step of ultimate intervention. A comprehensive discussion of early intervention criteria and mechanisms is beyond the scope of this module. Importantly, however, a level established above the minimum serves as a valuable tool for the supervisor to graduate the intervention.

The minimum solvency margin criteria may be viewed as providing a buffer at a base level of security. If an insurer is below this level, the market and the lawmakers have determined that it should not continue to operate. However, insurers operating as going concerns should not be content to function on this minimum, that is, on the borderline. When a company is well above the borderline, the supervisor and the public can expect that it can withstand a period of adversity without falling below this critical level. This higher level provides the company with the opportunity to take corrective action and to allow this corrective action to flow through to a turnaround in its financial position.

Consider figure 1, which sets out a very specific example of how the control level may be used to trigger supervisory intervention. In practice, processes will not always be as definitive between levels as is discussed here. The purpose of this description is to illustrate one approach. In this case, the supervisor uses three control levels: a regulated minimum and two control levels above this. The control levels in the example increase over time in response to the growth of the insurer.

Figure 1. Insurer's position vs. Control levels



Initially, the company was below the first control level but not below the solvency requirement. The supervisor would be giving close attention to a company in this situation.

The company position improved such that it exceeded the first control level and moved into the higher band. In such a situation, the confidence of the supervisor in the insurer's viability

would have increased. Management had been able to execute a corrective action plan that worked well, although with a brief setback. Still, the degree of supervisory oversight was likely to reflect the concern that the company did not have as complete a capital buffer as it would have had if it had been above the second control level. Once the company exceeded the second control level, the supervisor became more comfortable with the company and less intrusive in its oversight.

In the example, the company continued under this less intense or "normal" supervision for an extended period before briefly dropping below the second control level. At this point, the supervisor became more concerned. Supervisory inquiries quickly produced an improvement in the situation. However, this improvement proved short-lived. The company's situation deteriorated rapidly and, in spite of increasing supervisory intervention, management's corrective actions failed to halt the deterioration. Eventually, when the minimum solvency requirement was breached, it became necessary to place the company into administration.

The example demonstrates that control levels can be used by supervisors to prompt earlier interventions on a graduated basis.

A second, equally important use of control levels is to encourage an insurer to explicitly incorporate solvency buffers when doing its business and financial planning. No insurer owner, board, or senior manager should be comfortable existing on the borderline of the ultimate supervisory intervention. Given the uncertainties of investment markets and insurance claims outcomes, there may be periods in which net worth declines, even if its general trend is upward. Therefore, management, boards, and owners should operate with a margin above the minimum level to avoid the risk of a "few bad days" leading to the company's being placed under official administration and to their personal loss.

Both of these arguments illustrate the usefulness of understanding risk (volatility of results) when assessing the adequacy of capital, capital buffers, and having levels of control above the minimum. The level of control, from the perspective of the supervisor as well as the company management and boards, should be such that:

- The existence of a problem can be identified
- Corrective action can be put in place. and
- The corrective action has a chance to take effect before the situation deteriorates.

Some jurisdictions establish control levels through legal instruments. Some do so by publishing their approach to intervention either with or without a precise numerical description of the actual levels. Supervisors in some jurisdictions, particularly those in which the number of companies is small, require each insurer to have a capital buffer policy approved by its board and then agree, formally or informally, to that internal level. Likewise, intervention can be more or less formal depending on the jurisdiction. Clearly, the ultimate intervention of

closure needs to have the full support of the law. However, depending on the history and practice in the jurisdiction, the use of moral suasion may play a significant role in higher-level interventions.

Another way that greater resilience can be promoted by a solvency regime is to test the effect of adverse situations on the company position. Stress testing is a very powerful tool that can be used by companies as part of their capital adequacy management systems.

Stress testing involves developing alternative scenarios and considering the effect that these scenarios would have on the company balance sheet position, either immediately or, in some cases, over time. Such testing can help the company identify significant risks and put in place procedures to limit these risks or plans to respond to the risks if they occur.

In some jurisdictions, stress testing is part of the broader solvency regime. Companies are required to perform stress tests as part of their risk management process, with results being considered by their boards. These tests then are discussed with the supervisor so that the supervisor can be comfortable that the company has adequately addressed the identified risks.

In other cases, the stress test can be part of the capital requirement itself. For example, for asset liability mismatch risks, a defined adverse scenario may be tested and the difference between the position under normal circumstances and the adverse scenario may be required to be held as an additional provision or reserve.

Many jurisdictions now require insurers to do what is generally termed an ORSA (Own Risk and Solvency Assessment), which is generally an internal tool that boards of insurers should use to assess the risk that the insurer is exposed to, and how these risks are managed and mitigated.

3.4 Issues related to branches and groups

When considering rules for solvency, special considerations arise in the case of branches of foreign insurers. The reason is that the branch is not a fully self-contained legal entity. Rather, it is part of the whole company, and that company is incorporated in another jurisdiction and does business in more than one jurisdiction. See case study 2.

A key concern of the supervisory regime is to ensure that the resources necessary to support policyholder obligations are available when needed. In the case of a *branch*, the capital is usually not segregated, and it is not possible for a branch operation to fail without the whole company failing. This situation is different from the case of a *locally incorporated insurer*, which could become insolvent even though the group or parent company remains solvent.

Of course, an insurer may become insolvent for reasons other than those relating to the assets and liabilities that are generated by its branch operations. If such insolvency occurs, the branch will nevertheless be affected. In contrast, in the case of a locally incorporated subsidiary, the

insolvency of its parent resulting from losses in business activities outside the subsidiary would not automatically cause the subsidiary to become insolvent. The parent company could sell the local subsidiary, which is a separate legal entity, to another owner. In the case of a branch, such a sale is not possible.

The legal requirements imposed on branches seek to limit the exposure of local policyholders to the risks associated with the branch legal structure. Supervisory requirements tend to focus on identifying the obligations to local policyholders and then securing the rights to assets sufficient to meet these obligations. These requirements provide some protection to policyholders without requiring a separate legal entity, thereby facilitating foreign branches.

For example, the regulations may require that assets equal to the technical provisions for the local business of the branch be held in the jurisdiction, under the control of a local authorised officer, or even subject to some control by the supervisor so that they will be available if needed. Some jurisdictions additionally require assets equal to the equivalent level of capital that would be required of a separate insurer to be held locally.

Some of the issues that arise with branch operations can be avoided by requiring the use of separate legal entities for various activities. However, if an insurer operates as part of a group, a different set of issues needs attention. These issues occur regardless of whether the group is locally owned, international, focused on the insurance sector, or more diverse in its scope of operations.

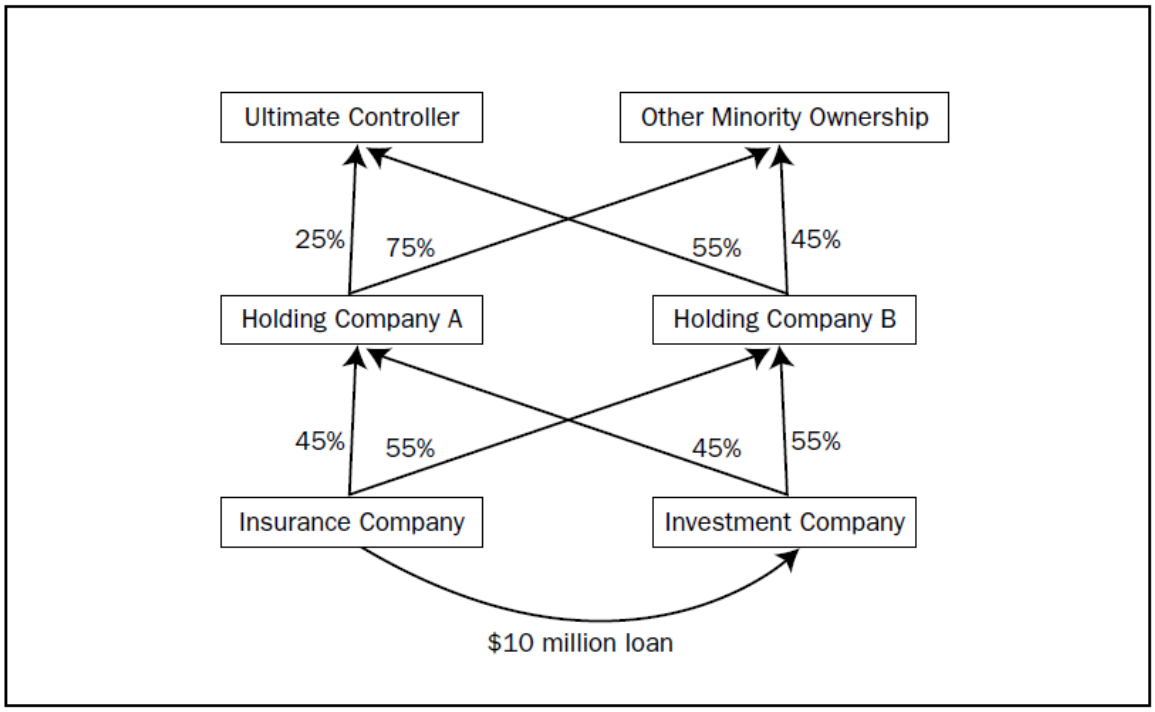
Risks can spread through a financial group when the group has transactions among its various entities. For example, if an insurer lends money to another company in the group, it would show that investment as an asset on its balance sheet. Without any adjustment to the solvency rules, this asset would count toward meeting the obligations to policyholders. If the borrowing company gets into financial difficulty, the value of the investment for the insurer may be at risk. In other words, the risk of the other company in the group is transmitted to the insurer, that is, contagion.

Although this credit risk may seem similar to that inherent in any investment, the risk is heightened because the lending decision may have been taken under pressure from group management rather than based on an objective assessment of the credit risk.

Another group risk is the potential contagion through the transfer of reputation. An insurer may be well run but may find that concerns arise in the minds of customers if there is some concern about another part of the group that operates under the same brand or name. In such cases, management must often take proactive steps to reassure customers that the problems in one part of the organisation has no effect on the insurer. For example, a supervisor may announce that it is investigating certain accounting issues with a non-life insurer. As a result, the life insurer operating separately but under the same brand name may suffer reduced sales and reduced confidence from the independent financial advisory community.

In the event of financial distress, related party assets often prove to be of limited value. A company that is badly run can use related party transactions to inflate the value of the assets of the group or to reduce the assets available to policyholders. Consider the following example, which also is displayed in figure 2.

Figure 2: Example of an insurer within a corporate group



An insurer and an investment company are both owned by the same parent holding company. Although the ultimate controller does not own the majority of the insurer via their 25 percent ownership of the holding company A, they nevertheless are able to control the board of the insurer by appointing directors with the votes of holding company B, which they control through 55 percent ownership. As a result, the insurer's loan to its sister investment company transfers assets away from the supervisory sphere of the insurance supervisor.

Multiple gearing of capital can also be a consideration. In the above example, multiple gearing could occur if the insurer were going to use some of its assets to purchase another insurer. The value of the newly owned insurer subsidiary would appear as an asset on the balance sheet of the existing company. However, part of this value would be the solvency margin of the subsidiary, intended to protect its policyholders. If the full value of the subsidiary were counted on the existing company's balance sheet for solvency purposes, the same capital would be providing protection twice and so be double counted. As a result, solvency regimes must include rules to avoid this double-counting of capital required for prudential purposes.

Recycling of capital can also occur in a group. Again using the above example, if the investment company were to take the proceeds of the loan from the insurer and lend them back to the

ultimate owner, the owner could use the funds to purchase more shares in the insurer. In effect, the assets of the insurer would have been used to increase its own capital. The more this type of transaction takes place, the greater the *reported* capital of the insurer when, in fact, there would have been no *real* improvement in its capital position. To restrict such practices, regulations usually make adjustments to the capital formula or prohibit such loans.

Ultimately, to address the concerns raised by the membership of insurers in groups, supervisors need to consider both the solvency of the insurer itself and the solvency situation of the wider group. In some jurisdictions, this is referred to as the "solo plus" approach. The term, "group-wide supervision,'' when used in reference to insurance does not mean that the individual entity is ignored and only the consolidated accounts are considered. Rather, it refers to the need to assess the group-wide situation and is in addition to the "solo" entity position. Several techniques can be used to assess group-wide capital adequacy of a financial conglomerate. They include the:

- Building block approach, which compares the sum of the capital required of each solo entity with the consolidated capital of the group.
- Risk-based aggregation approach, which compares the sum of the capital required of each solo entity with the sum of the capital of each solo entity minus any intragroup holdings of supervisory capital.
- Risk-based deduction approach, which adjusts the unconsolidated capital of the parent by deducting its investments in dependents, adding any excesses or subtracting any shortfalls of supervisory capital of the dependents, and compares the result with the parent's solo capital requirement.

As a quick check for double gearing, a total deduction calculation can also be made. It is similar to the risk-based deduction approach but provides no credit for any excesses of supervisory capital of the dependants.

Case study 2 gives a more practical example of how the capital between different entities in a group can be compromised.

3.5 Case study 2. Effect of insolvency on a branch

An insurer that had a large branch in another jurisdiction became insolvent. Assets held in the branch equalled liabilities to policyholders in that jurisdiction. However, a large portion of these assets consisted of debt securities issued by the parent. When the parent went under, the branch was no longer solvent. The debt was listed under *short-term securities*, for which solvency is rarely an issue, which hampered the detection of this problem.

Exercises – Section 3

Answer the following questions considering, where indicated, the practices in your jurisdiction. If you are working with others on this module, develop the answers through discussion and cooperative work methods.

Ex 10 In some jurisdictions, the fixed-amount minimum capital requirements differ between life insurers and nonlife insurers. Why might that be the case? What are the fixed minimum solvency requirements for insurers in your jurisdiction?

Ex 11 Would you describe the solvency requirements in your jurisdiction as being index based or risk based? How does the solvency regime in your jurisdiction respond to each of the following risks: technical, credit, concentration, liquidity, market, basis, and operational?

Ex 12 Insurer A has been unprofitable, due to unexpectedly rapid increases in the cost of motor insurance claims. Management of the insurer has responded to this situation by increasing both premium rates and technical provisions. Solvency requirements in the local jurisdiction are calculated, in part, with reference to an insurer's premiums and technical provisions. What are the short-term and longer-term implications of management's action on Insurer A's solvency position? How might the supervisor respond to this situation?

4 Summary and conclusions

A fundamental objective of insurance supervision is protecting the interests of current and prospective policyholders. Solvent insurers with adequate capital should have the financial means to make good on their obligations to policyholders. Those that are financially weak often present a range of supervisory challenges and pose a greater risk of defaulting on their obligations.

Solvency difficulties can often be traced back to internal causes such as problems with management, shareholders, or other external controllers of the insurers. Clearly, good governance and risk management are essential to the maintenance of solvency.

Capital serves as a precaution against adverse experience and financial fluctuations, helping an insurer to maintain solvency while it deals with the many risks to which it is subject. While possible sources of capital are numerous, the relevance of each to a particular insurer will depend on such factors as its corporate legal form, who owns it, its stage of development, and its financial position and performance. The quality of capital depends on its availability to cover unexpected losses, both currently and prospectively. Preferably, capital should be both presently available and permanent.

Solvency regimes must address, in a consistent manner, liabilities, assets, matching assets with liabilities, suitable forms of capital, and capital adequacy requirements. For example, since solvency is fundamentally an assessment of an insurer's balance sheet, it is impossible to make an adequate assessment of solvency unless the liabilities and assets in the balance sheet are valued appropriately. In recent years, there has been a trend toward integrating quantitative solvency requirements into broader solvency regimes. For example, the EU Solvency II, the IAA recommendations, and the Basel II Capital Accord for banks each identify quantitative capital adequacy requirements, supervisory assessment of risk management, and disclosure of information as key elements, or pillars, of a broader solvency regime.

Risk is considered to be the potential for variability in outcome, particularly adverse outcomes. A relatively simple taxonomy of risks faced by an insurer might include technical, credit, concentration, liquidity, market, basis, and operational risks. New insurers may be subject to heightened risk. Each of these risks needs to be considered when establishing capital adequacy requirements.

The regulation of capital has two basic objectives:

- To provide a minimum level of resources considered prudent for supervisory purposes, and
- To provide a trigger for intervention.

Two main approaches are taken to define the minimum solvency requirement:

- The index-based method, and
- The risk-based capital (RBC) method.

An index-based regime is characterised by a solvency margin that is determined by using fairly simple calculations that refer to a range of balance sheet or income statement indexes. Risk-based capital solvency regimes attempt to more closely reflect the risks assumed by each insurer by using more complex formulas and statistical techniques.

However, there is some concern that neither of these approaches appropriately reflects the risks of insurers whose circumstances may vary significantly. Therefore, any jurisdiction considering changes in its solvency regime should take note of emerging international developments.

The solvency regime in every jurisdiction should reflect the circumstances in that jurisdiction. The adoption of another jurisdiction's system without consideration of whether its parameters are appropriate in a different local context may not result in adequate minimum solvency requirements. For example, the valuation of the assets and the technical provisions influence the amount of the solvency margin in the accounts, and the parameters need to consider these elements.

As should be evident from this module, determining how much capital will be adequate to ensure solvency can be a complicated and, to some extent, judgmental process. Nevertheless, the ICPs reinforce the fact that, while the establishment of solvency requirements is essential, the work of supervisors cannot stop there. Solvency must be monitored and assessed regularly, through both offsite and onsite activities.

Finally, if solvency problems are noted, supervisors must intervene.

Exercises – Section 4

Ex 13 Each of the following three cases describes an insurer that presents a serious solvency challenge. For each case, answer the four questions below. If you are working with others on this module, develop the answers through discussion and cooperative work methods.

a) Why might the situation have occurred?

b) What elements of a solvency regime could help prevent its occurrence?

c) Given that it has occurred, what elements of a solvency regime could help protect policyholders from excessive loss?

d) What corrective actions would you propose?

Case 1

A bank has set up a composite insurer to provide life, annuity, motor, and property policies to its customers. The bank provides centralised human resources, investment, and accounting services to all group companies. The insurer has been growing rapidly in all lines of business. However, paid claims ratios on the nonlife business have been much higher than those of competitors, while the life and annuity lines experienced significant losses recently, when interest rates moved sharply.

Case 2

A large foreign nonlife insurer is operating locally through a branch. Its book of business includes local personal and small commercial clients, as well as very large risks arising from its multinational clients. Large risks are underwritten at the headquarters, where reinsurance is also arranged. Losses due to a recent fire that destroyed the factory of a multinational client exceed the assets invested locally.

Case 3

The board and management of a mutual insurer take pride in serving policyholders by charging low premium rates, providing long-term interest rate guarantees, and investing in their business ventures. A downturn in the economy has led to high investment defaults, market interest rates lower than the policy guarantees, and increased lapses.

5 Further reading

5.1 General sources

Many texts are available which are relevant to the material in this module. These texts may also go beyond the scope of this module, but usually include introductory chapters on the basic topics.

When reading these texts it is useful to consider the principles being as well as the details of their application in a particular environment. Also, it is important to recognise that as the environment changes the relative importance of issues may also change.

Other sources of information are also available. For example, in many countries there is an insurance institute of some form. The Chartered Insurance Institute (CII), based in England, provides a range of good educational programs and has links to more than 70 other insurance institutes worldwide (see www.cii.co.uk).

In some cases, supervisory websites are also valuable sources of information. This can be particularly the case when supervisors publish explanatory information explaining their requirements and approaches.

Review Questions

After studying this module on regulation and supervision supporting inclusive insurance markets, answer the questions below. The questions to help you gauge your understanding of this topic. An answer key is given in Appendix 1.

For each of the following questions, unless otherwise indicated, choose the response that is correct or most relevant.

R1 An insurer can be considered solvent if it:

a) Has enough cash to pay all claims that are currently outstanding

b) Is able to meet its obligations under all contracts at any time

c) Has assets at least equal to its liabilities

d) Is part of a conglomerate that is rated B+ or higher by a rating agency

R2 A shareholder-owned insurer may be able to obtain additional capital by:

a) Drawing upon a line of credit with its bank

b) Issuing shares and selling them to investors

c) Making special capital assessments against its policyholders

d) Borrowing money from its corporate parent

R3 Suitable forms of capital include:

a) All assets in excess of an insurer's technical provisions

b) Margins of conservatism in the technical provisions due to the specification of a low discount rate by the supervisor

c) Retained earnings available to cover any unexpected losses

d) The proceeds obtained by issuing short-term debt securities

e) The amount indicated in a letter from the board of directors of an insurer's corporate parent expressing the intent to contribute additional funds

R4 Insurer A operates in a jurisdiction that has an index based solvency regime. The minimum solvency margin is based on the maximum of three indices: 15 percent of premiums; 25 percent of claims costs; and 10 percent of technical provisions. The regime also includes an absolute minimum solvency margin of $10 million. The financial statements of Insurer A show premiums of $100 million, claims costs of $80 million, and technical provisions of $200 million. What is the minimum solvency margin that must be maintained by Insurer A?

a) $10 million

b) $20 million

c) $25 million

d) $30 million

e) $55 million

f) $65 million

R5 Risk-based capital adequacy regimes generally require:

a) The application of factors to an insurer's technical provisions, but not to its assets

b) The use of internal models to determine the capital required for operational risk

c) The addition of the amounts of capital required in respect of various types of risks to calculate the total minimum requirement

d) The services of actuaries to make the calculations

R6 The primary purpose of solvency control levels is to:

a) Establish a trigger for early intervention by the supervisor

b) Ensure that an insurer does not invest an excessive proportion of its assets in speculative ventures

c) Determine the portion of an insurer's assets that should be invested in local currency in order to meet obligations to local policyholders

d) Indicate when an onsite inspection may be required

R7 A solvency regime may appropriately place different requirements on an insurer operating in the jurisdiction through a branch than on a domestic insurer because:

a) Branches have no capital that is legally their own

b) Domestic insurers may be more highly taxed than branches, so the competitive playing field must be levelled

c) Assets of a branch are likely to be invested in foreign currencies

d) Investment within the jurisdiction should be required in order to promote economic development

R8 Techniques for preventing the inflation of capital that might otherwise occur in the case of an insurer that is a member of a corporate group include:

a) Calculating capital adequacy on a consolidated basis

b) Valuing investments in affiliates at book value

c) Closely examining the nature and financial impact of reinsurance placed with unrelated reinsurers by other companies in the group

d) Prohibiting the issuance of insurance policies to an insurer's parent

R9 It is reasonable to expect an insurer to maintain sufficient capital to fully mitigate the potential effects of inadequate risk management.

a) True

b) False

R10 Capital adequacy requirements ensure than an insurer will remain solvent.

a) True

b) False

R11 Which of the following concepts of solvency requires the most capital to achieve?

a) Going concern

b) Runoff

c) Break up

R12 The capital available to meet solvency needs is most limited in which situation?

a) Going concern

b) Runoff

c) Break up

R13 Which *two* of the following risks are least amenable to being mitigated by capital?

a) Underwriting

b) Credit

c) Market

d) Liquidity

e) Operational

R14 Provide at least *three* reasons why it is appropriate to require that a small, newly formed insurer have more capital, in relation to its premium income, than a large, well established insurer.

R15 What are the *five* areas that a solvency regime should address in a consistent manner?

R16 Insurer B operates in a jurisdiction that has a risk-based solvency regime. The minimum capital requirement is based on factors of 10 percent of premiums, 5 percent of technical provisions, 10 percent of assets invested in corporate bonds and 15 percent of assets invested in equities and real estate, with no adjustment for correlation of risks. The regime also includes an absolute minimum capital requirement of $10 million and a solvency control level of 150 percent. The financial statements of Insurer B show premiums of $100 million, technical provisions of $200 million, and investments of $50 in bank accounts, $50 million in government bonds, $80 million in corporate bonds, $20 million in equities and $30 million in real estate. What is the minimum capital required of Insurer B?

R17 How much capital must be maintained by Insurer B to satisfy the solvency control level?

Appendix 1: Answers to Exercises and Review questions

Exercises

Answer 1 All parties are interested in the continued viability of the insurer. However, the board and senior management may focus more on returns to shareholders, and the rate of return will be higher if excess capital is minimised. The supervisor's focus is on protecting policyholders, and additional capital increases the level of protection.

Answer 2 Discuss with others in your supervisor.

Answer 3 Discuss with others in your supervisor.

Answer 4 Discuss with others in your supervisor.

Answer 5 The first approach is generally easier to calculate and validate, while the alternative may provide a more accurate picture of an insurer's economic condition, although it may require more actuarial expertise, both at the insurer and at the supervisor. Discuss with others in your supervisor the approach used in your jurisdiction.

Answer 6 Discuss with others in your supervisor.

Answer 7 Limits on concentration of reinsurance may be established. Credit for reinsurance in excess of specified limits may be disallowed. The posting of collateral by reinsurers may provide further protection.

Answer 8 Discuss with others in your supervisor the approach used in your jurisdiction.

Answer 9 Discuss with others in your supervisor.

Answer 10 Fixed amount minimums may differ if the level of resources required to establish a life insurer and build it to a viable size are viewed as being significantly different from those required for a nonlife insurer. Discuss with others in your supervisor the minimum requirements in your jurisdiction and how and when they were established.

Answer 11 Discuss with others in your supervisor.

Answer 12 In the short term, the solvency position may appear to worsen, because the higher premiums will translate into higher capital requirements and, therefore, less excess capital. In the longer term, the higher premiums should produce profits for the insurer, improving its level of capital. The supervisor might respond by requesting both short and longer-term projections of the insurer's financial position and considering the results in deciding whether an additional infusion of capital should be required.

Answer 13

Case 1

a) It is quite possible that lack of insurance expertise is the root cause of the problems at this insurer. Rapid growth combined with high claims ratios provides an indication of underpricing. The losses on life and annuity business may be due to mismatching of assets and liabilities. Since many services are being provided at the group level, those doing so may have limited understanding of the insurance business and how it differs from the core banking business of the group.

b) Supervisory review of premium rates, restrictions on investments, a requirement that an investment policy be adopted by the board and reviewed by the supervisor, a requirement that asset liability management be implemented, and stress testing could help prevent such a situation.

c) Supervisory review of the adequacy of technical provisions, capital adequacy requirements, and solvency control levels could help protect policyholders.

d) The insurer might be required to adopt an investment policy, implement ALM, reduce or stop writing new business, or obtain additional capital.

Case 2

a) The local management of this branch does not fully control the business that is being written. Major financial and underwriting decisions are being made at the head office, which would appear to be focusing on overall results of the insurer without much attention to the financial position of the branch, that is, assets generated by the branch versus its liabilities.

b) Risk concentration limits, reinsurance requirements that relate to the size of the branch, and a requirement that assets in the branch exceed liabilities to policyholders of the branch by a solvency margin all might help prevent such a situation. Separation of the local personal and small commercial lines business into an adequately capitalised subsidiary also could help protect such policyholders.

c) Requirement that assets supporting local policyholders be held in a local trust, control of payments from the branch to the headquarters, supervisory monitoring of the financial condition of the insurer as a whole, and communication with the home supervisor could help protect policyholders.

d) The insurer might be required to limit the branch's exposure to large risks, to invest more assets in the branch, or to cease writing new personal or small commercial policies.

Case 3

a) The board and senior management of this insurer are excessively focused on customer satisfaction and growth, with inadequate consideration of the financial implications of their business approach. The insurer also might lack risk management expertise.

b) Supervisory review of premium rates and policy provisions, a requirement that an investment policy be adopted by the board and reviewed by the supervisor, supervisory review of the nature and quality of invested assets, a requirement that asset liability management be implemented, and stress testing could help prevent such a situation.

c) Asset quality and diversification requirements, a requirement that technical provisions explicitly reflect interest rate guarantees, supervisory review of the adequacy of technical provisions, capital adequacy requirements, and solvency control levels could help protect policyholders.

d) The insurer might be required to adopt an investment policy that restricts investments in policyholders' businesses, implement ALM, reduce the interest rate guarantees and increase the premium rates for new business, or reduce or stop writing new business. If the insurer's financial position is very poor, it may be required to raise capital, which is very difficult for a mutual insurer, or be wound up.

Review questions

Answer 1 b. See section 1.

Answer 2 b. See section 1.

Answer 3 c. See section 2.

Answer 4 b. See section 3; capital required is the greatest of the various results.

Answer 5 c. See section 3.

Answer 6 a. See section 3.

Answer 7 a. See section 3.

Answer 8 a. See section 3.

Answer 9 b. See sections 1 and 3. It is financially unfeasible to maintain enough capital to fully protect the solvency of an insurer that seriously neglects its risk management

Answer 10 b. See sections 1 and 3.

Answer 11 a. See section 1.

Answer 12 c. See section 2.

Answer 13 d. and e. See section 3.

Answer 14 Any three of the following are correct; see section a:

- It needs to finance start-up expenses.
- Its new business acquisition costs are likely to be high.
- It will have a small flow of profits from existing business.
- It is at greater risk of adverse underwriting experience, due to its smaller and probably less diversified portfolio of business.
- It is at greater risk of asset value fluctuations, due to its small and less diversified investment portfolio.

Answer 15 All five of the following;

- Valuation of liabilities
- Quality, liquidity and valuation of assets
- Matching of assets and liabilities
- Suitable forms of capital
- Capital adequacy requirements

Answer 16 $35.5 million

Answer 17 $53.25 million

Core Curriculum for Insurance Supervisors

Module 5.6.1 Solvency - Principles and structures

Further information

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