

**INTERNATIONAL ASSOCIATION OF
INSURANCE SUPERVISORS**



**THE IAIS COMMON STRUCTURE FOR THE
ASSESSMENT OF INSURER SOLVENCY**

FEBRUARY 2007

This document was prepared by the Solvency and Actuarial Issues Subcommittee in consultation with IAIS Members and Observers.

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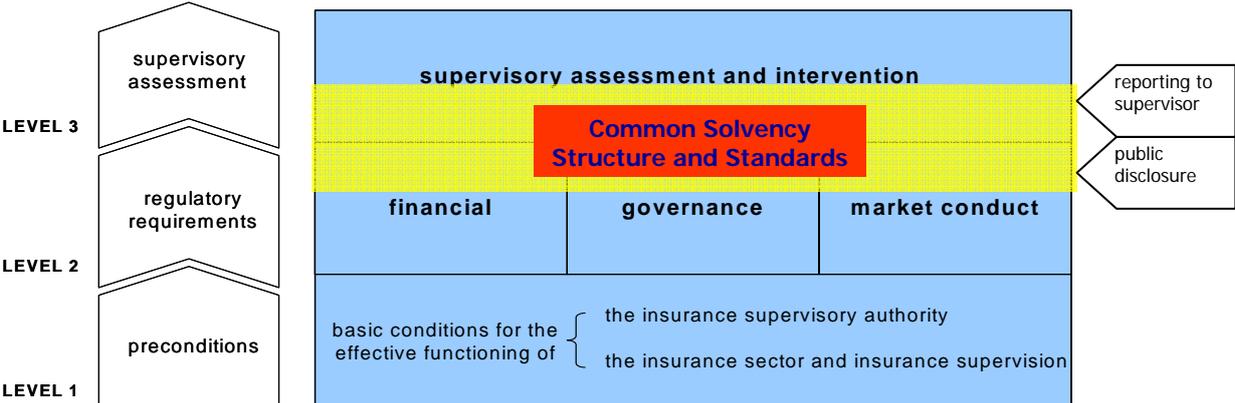
Executive Summary

The IAIS was established in 1994. Its objectives¹ are to:

- cooperate to ensure improved supervision of the insurance industry on a domestic as well as on an international level in order to maintain efficient, fair, safe and stable insurance markets for the benefit and protection of policyholders
- promote the development of well-regulated insurance markets
- contribute to global financial stability.

Efficient and well-regulated insurance markets help to attract and retain capital and enhance global financial stability, thereby securing protection for and ultimately benefiting policyholders.

To this end, the IAIS has commenced a major project to formulate a consistent, reliable and transparent approach to the assessment of insurer solvency. This Structure paper follows on from the earlier Framework, Cornerstones and Roadmap papers. Within the context of the *Common structure for the assessment of the insurer solvency* and the levels and blocks of the Framework (as illustrated below) this paper describes the overall IAIS risk based approach to the assessment of insurer solvency.



It presents, within this wider context, a coherent risk based methodology for the setting of regulatory financial requirements and the respective roles and determination of technical provisions and required capital in a risk based solvency regime. The paper also addresses the other more qualitative components of the Solvency Structure, namely governance, market conduct and disclosure requirements.

Building from the Cornerstones, the Structure paper articulates and explains a number of Structure Elements that illustrate the concepts that should underpin the Solvency Structure in a regime as follows:

¹ See IAIS By-laws (2004)

Framework Level 1 – Preconditions for Solvency Assessment

Structure Element 1:

The supervisor must have adequate powers to:

- *require an insurer to assess and manage the risks to which it is exposed;*
- *set regulatory financial requirements for individual insurers to protect policyholders' interests; and*
- *require that, if necessary, an insurer holds additional capital or takes action to reduce its risks so that the assets it holds are sufficient and appropriate.*

Framework Level 2 – Financial Requirements

Cornerstone I: the solvency regime addresses the robustness of the insurer to meet its liabilities both short-term and over a longer time span.

Structure Element 2:

Risk sensitive regulatory financial requirements should provide incentives for optimal alignment of risk management by the insurer and regulation.

Cornerstone II: the solvency regime is sensitive to risk, and is explicit as to which risks, individually and in combination, lead to a regulatory financial requirement and how they are reflected in the requirement.

Cornerstone III: the solvency regime is explicit on how, for each of the risks that attract a financial requirement, individually and in combination, prudence is reflected in these requirements.

Structure Element 3:

A solvency regime should address all relevant potentially material risks, including underwriting risk, credit risk, market risk, operational risk and liquidity risk. All risks should, as a minimum, be addressed by the insurer in its own risk and capital assessment.

- *Risks that are generally readily quantifiable should be reflected in sufficiently risk sensitive regulatory financial requirements.*
- *For risks that are less readily quantifiable, regulatory financial requirements may need to be set in broad terms and complemented with qualitative requirements.*

A risk sensitive solvency regime should require insurers to assess and manage the risks to which they are exposed and appropriately assess and maintain their capital needs. By requiring this, supervisors can effectively achieve their aims of protecting policyholders and maintaining well-founded market confidence. These aims require adequate levels of capital and this in turn requires that risks are measured properly. Regulatory financial requirements therefore need to be firmly rooted in economic valuation and provide the basis and incentives for optimal alignment of risk management by the insurer and regulation. Regulatory financial requirements should be as complete as practicable, i.e. include all risk factors that can be appropriately translated into a financial requirement.

A risk sensitive solvency regime could use some or all of the following:

- regulatory financial requirements, ranging from sophisticated risk sensitive requirements to simple ratios or even nominal minimum requirements including necessary safety measures
- quantitative limits to risk exposures
- qualitative requirements
- additional quantitative or qualitative requirements arising from supervisory assessment.

Specific financial regulatory requirements should be formulated covering at least underwriting risk, credit risk and market risk, as these risk types may generally be considered to be readily quantifiable compared with the other main risk types, operational and liquidity risk.

Structure Element 4:

A total balance sheet approach should be used to recognise the interdependence between assets, liabilities, capital requirements and capital resources and to ensure that risks are fully and appropriately recognised.

This recognises the need to assess the overall financial position of an insurer based on explicit identification and consistent measurement of risks and their potential impact on all components of the total balance sheet.

Cornerstone IV: the solvency regime requires a valuation methodology which makes optimal use of and is consistent with information provided by the financial markets and generally available data on insurance technical risks.

Structure Element 5:

Insurance contracts are written in the expectation that obligations under them will be settled with the claimant or beneficiary. The vast majority of obligations are discharged by insurers through settlement of insurance contracts rather than the transfer of obligations to another insurer.

In the absence of deep liquid secondary markets that provide sufficiently robust values of insurance obligations, elements of insurance obligations should be valued using cash flow models or other methods that reflect the settlement of the insurance obligations and accord with principles, methodologies and parameters that the market would expect to be used. Such valuations could be considered to be "market consistent".

Such valuations provide consistency with the other elements of the balance sheet for which reliable market values are available and with the assessments made by market participants of value and risk.

Structure Element 6:

A market consistent valuation of technical provisions should be based on the risk characteristics of the portfolio rather than the characteristics of the specific insurer holding the portfolio. However it may be appropriate to use assumptions that reflect aspects of the insurer's specific business model and practices where they can be sufficiently substantiated.

Cornerstone VI: the solvency regime requires the determination of a 'best estimate' of the costs of meeting the obligations arising from the insurance portfolio, taking into account the time value of money, determined by reference to the relevant risk free interest rates on the financial markets.

Cornerstone V: the solvency regime includes the definition of technical provisions. Technical provisions have to be prudent, reliable, and objective and allow comparison across insurers worldwide. Technical provisions include an explicit risk margin.

Structure Element 7:

Given the intrinsic uncertainty of insurance obligations, the technical provisions need to include a risk margin over the current estimate of the cost of meeting the policy obligations. The risk margin should be calibrated such that the value of the technical provisions is equivalent to the value that an insurer would be expected to require in order to take over the obligations.

Structure Element 8:

From a regulatory perspective, the purpose of capital is to ensure that, despite adverse conditions, policy claims and obligations will still be met as they fall due and the required technical provisions remain covered.

Structure Element 9:

In a market consistent valuation methodology, technical provisions should be calibrated based on assumptions about diversification of the relevant risk factors which are consistent with market assumptions. Lack of diversification within a risk factor, relative to these assumptions, should be reflected in (increased) required capital, not in technical provisions.

Therefore, volatility in underwriting risk greater than used to calibrate the technical provisions should be covered by capital requirements and not technical provisions.

Structure Element 10:

Mismatch risk exposure which is not intrinsic to the policy portfolio and is assumed voluntarily by the insurer should be reflected in required capital, and not in the technical provisions.

Structure Element 11:

The risk reflected in the risk margin in technical provisions relates to all liability cash flows and thus to the full time horizon of the insurance contracts underlying these technical provisions.

Capital requirements should be calibrated such that, in adversity, assets will exceed technical provisions with a specified level of safety over a defined time horizon.

Cornerstone VIII: the solvency regime allows a set of standardised and more advanced approaches to determine the solvency requirements, and includes the use of internal models if appropriate.

Framework Level 2: Governance Requirements

Structure Element 12:

The supervisory regime should require insurers to have and maintain corporate governance policies, practices and structures and undertake sound risk management in relation to all aspects of their business. Sound governance is a pre-requisite for a solvency regime to operate effectively.

Risk sensitive financial requirements can only fulfil their intended role if the insurer meets sound governance, market conduct and public disclosure requirements. Sound corporate governance and professional advice relate to all aspects of the insurance business, with a specific role for non-executive directors and auditing and actuarial professionals, to improve objectivity and achieve the required checks-and-balances in the governance structure. Some risks may be addressed only through governance requirements rather than by setting regulatory financial requirements.

Framework Level 2: Market Conduct Requirements

Structure Element 13:

The supervisory regime should require insurers to have sound market conduct policies and procedures. The regime should be transparent as to how policyholder expectations should be expressed and reflected in solvency assessment.

Improper market conduct may have a direct prudential impact on an insurer, or may be damaging to the reputation of an insurer and hence have severe indirect consequences for its financial position and its ability to operate effectively. An insurer should therefore have sound market conduct policies and procedures. Some risks may be addressed only through market conduct requirements rather than by setting regulatory financial requirements.

Framework Level 3 – Supervisory assessment and intervention

Cornerstone VII: the solvency regime establishes a range of solvency control levels and the supervisory instruments associated with each of the control levels.

Structure Element 14:

There should be a number of solvency control levels which trigger different degrees of intervention by the supervisor in a timely manner. The solvency regime should have due regard to the coherence of the solvency control levels and any corrective action that may be at the disposal of the insurer, and of the supervisor, including options to reduce the risks being taken by the insurer as well as to raise more capital.

Supervision should aim to ensure that inadequacies in the operation of an insurer are resolved by the insurer. The supervisory powers should include the ability to impose and maintain, inter alia, an additional capital requirement for the additional risk that such qualitative deficiencies pose.

Disclosure

Structure Element 15:

The supervisory regime should specify which solvency information should be made public to enhance market discipline and provide strong incentives for insurers to conduct their business in a safe, sound and efficient manner which treats policyholders fairly.

Information provided to the supervisor and subject to confidentiality supports and fosters openness on commercially sensitive issues between the supervisor and the insurer.

The regime should be open and transparent as to the regulatory requirements in force, and be explicit about its objectives and the level of safety that it requires.

Public disclosure of information enhances market discipline, imposing strong incentives on insurers to conduct their business in a safe, sound and efficient manner. Insurer solvency and solvency assessment thus benefit from appropriate public disclosure. A regime would be expected to differentiate between public disclosure and reporting to the supervisor.

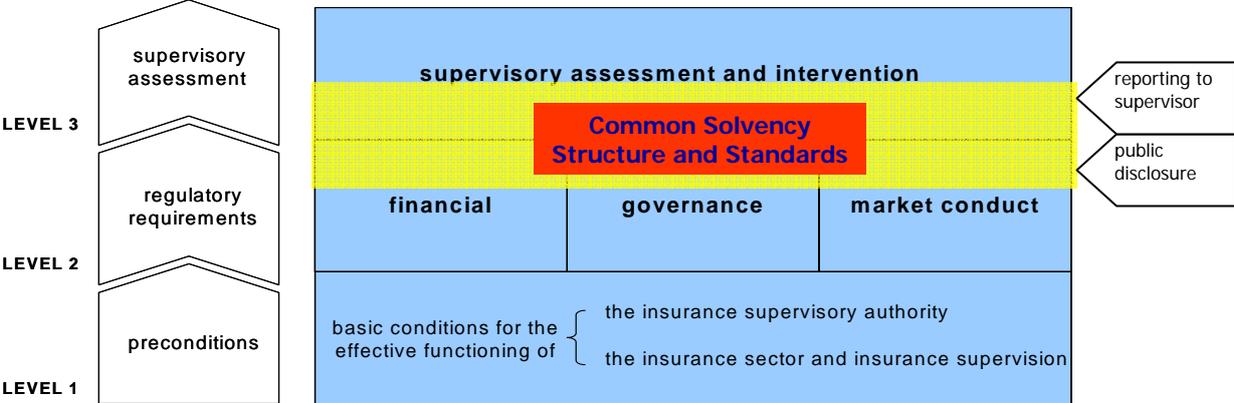
1. Introduction

1. This paper presents the IAIS principles-based *Common structure for the assessment of insurer solvency* (the Solvency Structure), setting out the main elements of the Solvency Structure and their interdependencies. It describes the overall IAIS philosophy on the assessment of insurer solvency and shows how the Solvency Structure and the standards that will be developed fit within the wider context of the levels and blocks of the IAIS framework for insurance supervision described in the Framework paper. The Structure paper builds on the *Cornerstones for the formulation of regulatory financial requirements* and in particular develops a coherent and systematic analysis of the main elements of the regulatory financial requirements. The Structure paper articulates and explains a number of Structure Elements - concepts to be considered in the development of the Solvency Structure - while acknowledging that certain of these concepts will be further analysed and developed in progressing the standards that will follow. The background to the Structure paper is summarised in the Appendix.

2. The Framework and Cornerstones papers identify the main elements in a regulatory and supervisory regime, comprising both quantitative (financial) and qualitative (governance and market conduct) components as illustrated in Figure 1 below². The Framework paper emphasises the interdependence of these quantitative and qualitative aspects in the assessment of insurer solvency. To keep the Framework stable and effective, less stringent requirements in one element imply a need for stronger measures in the others. However, a minimum level of coverage of each Framework element needs to be determined at a sufficiently exacting and granular level and agreed as an internationally acceptable standard.

3. The assessment of the financial position of an insurer for supervision purposes addresses both the insurer’s technical provisions and the required and available capital. The respective roles of technical provisions and capital in a solvency regime, and how technical provisions and capital requirements may be determined and calibrated, form the core of the analysis in the Regulatory Financial Requirements section in this Structure paper. The paper develops a more precise approach as to how a solvency regime should operate and the implications of this for how it should be structured.

Figure 1: The common solvency structure and standards and the role of disclosure within the Framework for insurance supervision



² This illustration is derived from the Framework paper, with a clarification of the role of disclosure.

4. Appropriate public disclosure and reporting to the supervisor may be considered as an overlay to each of the elements of the Framework, as also illustrated in Figure 1. This Structure paper addresses the need for a balanced approach to disclosure of solvency information and how this overlays the Framework. This includes the need for public disclosure and additional confidential reporting to the supervisor, and for the solvency regime itself to be transparent.

5. In these papers the IAIS expresses a high, yet realistic level of ambition. The IAIS is aware of the range of initiatives undertaken or currently underway to upgrade the thinking on and practice of solvency assessment, and the various techniques being developed and improved for those purposes. The IAIS expects that the IAIS papers will support and provide guidance to this dynamic process, leading to an enhancement, improved transparency and comparability, and convergence of the assessment of insurer solvency worldwide. The common structure and standards for solvency assessment are principles-based. Even so, the desired comparability and convergence could be encouraged and demonstrated within a framework of not only qualitative but also quantitative benchmarks.

6. The IAIS wishes to make full use of and build upon the wealth of knowledge and insight available in the supervisory community, industry and elsewhere. The IAIS particularly acknowledges the ongoing support and input from the International Actuarial Association (IAA).

7. The IAIS recognises the role of the International Accounting Standards Board (IASB) in formulating standards for public financial reporting³ specifically on the valuation of assets and the determination of insurance liabilities for that purpose. Although this Structure paper focuses on solvency assessment from a prudential supervisory perspective, the IAIS considers that the methodology for the determination of technical provisions and, more widely, the assessment of insurer solvency presented in this Structure paper is also relevant to the development of public financial reporting standards. The IAIS believes that it would be most preferable if the methodologies for calculating and analysing items in public financial reports are able to be used for, or are substantially consistent with, the methodologies used for regulatory reporting purposes, with as few changes as possible required to satisfy prudential reporting requirements. Any differences between regulatory reporting requirements and public financial reporting should be reconcilable and publicly disclosed⁴. The IAIS is therefore making an active contribution to Phase II of the IASB's Insurance Contracts Project.

³ Some jurisdictions refer to general purpose financial reporting rather than public financial reporting.

⁴ This statement is consistent with the position stated in the IAIS's *Second Set of Observations on Issues arising as a result of the IASB's Insurance Contracts Project – Phase II* (the Second Liabilities paper) – paragraph 3.

2. Framework Level 1 - Preconditions for Solvency Assessment

Structure Element 1:

The supervisor must have adequate powers to:

- ***require an insurer to assess and manage the risks to which it is exposed;***
- ***set regulatory financial requirements for individual insurers to protect policyholders' interests; and***
- ***require that, if necessary, an insurer holds additional capital or takes action to reduce its risks so that the assets it holds are sufficient and appropriate.***

8. The insurance industry and insurance supervision operate in a wider context, which may influence both the managing of an insurance business and insurance regulation and supervision. This includes the preconditions required for insurance and insurance supervision, as set out in the IAIS *Insurance Core Principles*. The specific preconditions in a particular jurisdiction will determine the specifics of effective supervision within a jurisdiction, and within segments of that jurisdiction, as a result of dealing effectively and practically with local preconditions. The solvency regime in force in a jurisdiction will need to address any specific characteristics of the insurance market and the context in which it operates, including any consequences for supervisory powers and instruments.

9. The Framework paper notes that two sets of basic conditions need to be in place for an effective supervision framework. These relate firstly to the basic conditions for effective functioning of the insurance sector and insurance supervision as efficient and well-regulated insurance markets help to attract and retain capital and enhance global financial stability, thereby securing protection for and ultimately benefiting policyholders. Effective insurance supervision requires an environment which has an institutional and legal framework for the financial sector and its supervision, well developed and effective financial market infrastructure and efficient financial markets. Further elaboration of this broad set of issues falls outside the scope of this Structure paper⁵.

10. The second set of conditions that need to be in place for an effective supervision framework relate to the effective functioning of the insurance supervisor. In the context of the development of the *Common structure for the assessment of insurer solvency*, the IAIS emphasises the need for the supervisor to have adequate powers to:

- require the insurer to assesses and manage the risks to which it is exposed and appropriately assess and maintain its total financial resources;
- set regulatory financial requirements for individual insurers which ensure that under both normal and adverse circumstances an insurer holds sufficient assets to protect policyholders' interests; and
- require that, if necessary, an insurer holds additional capital or takes action to reduce its risks so that the assets it holds are sufficient and appropriate.

11. In all circumstances a deep understanding of risk and risk management remains of key importance to the insurance industry and the supervisory community. The IAIS thus

⁵ Refer to the Insurance Core Principles and the Framework paper for a further consideration of the preconditions for insurance and insurance supervision. Cornerstone VIII also addresses flexibility within a jurisdiction.

emphasises most strongly the need for a regulatory regime, including solvency assessment, to be optimally attuned to the various risks in insurance and the management thereof. This implies a forward looking and prospective approach to be reflected in the determination of an insurer's current financial position and the need for additional analysis, such as business continuity analysis or dynamic financial analysis, over a longer time horizon.

3. Framework Level 2 – Regulatory Requirements

12. The Solvency Structure encompasses three blocks of topics: the financial block, the governance block and the market conduct block, and addresses the three levels of the Framework: preconditions, regulatory requirements and supervisory assessment/intervention. This Structure paper addresses the elaboration of each of these elements of the Solvency Structure, to the extent that they need to be taken into account in insurer solvency assessment, underlining the coherence of approach. The primary focus of the Structure paper, however, is on the financial block, which is addressed in the following section. Governance and market conduct are addressed in sections 3.2 and 3.3 respectively. However, they are much broader than solvency assessment and hence are addressed more fully in other IAIS work. Levels 1 and 3 of the Framework and disclosure requirements are also addressed more fully in other IAIS work.

3.1 Financial Requirements

13. The methodology in this paper for the formulation of the regulatory financial requirements in a solvency regime, and more precisely the role and determination of technical provisions and required capital, expands on a number of key elements in the Framework and Cornerstones papers. These elements include the level of safety required by and the need for robustness of the solvency regime, a total balance sheet approach, optimal use of market information, a prospective risk-based approach and the recognition of the time value of money.

14. The aim of the IAIS is to develop sufficiently detailed principles-based standards and guidance in relation to regulatory financial requirements in the context of insurer solvency assessment that are globally acceptable and applicable. To do this it is first necessary to develop the Structure Elements and concepts that underpin such regulatory financial requirements, which is the focus of this section of the Structure paper. It will then be possible, in further work, to consider more complex conceptual issues related to regulatory financial requirements and practical implementation issues including diversification of multi-line insurers, group structures or particular products.

3.1.1 A robust and risk sensitive solvency regime

<p>Cornerstone I: the solvency regime addresses the robustness of the insurer to meet its liabilities both short-term and over a longer time span.</p>

15. A robust solvency regime should aim to ensure that there is a high degree of certainty that insurance obligations can be met even if the insurer is unable to continue in business. The regime, and insurer, should thus consider the need to meet obligations in relation to the existing book of business, including a possible run-off or transfer of the insurance obligations, as well as addressing going concern situations, including the potential impact of new business.

16. Key objectives of the IAIS in developing the Solvency Structure are to enhance and improve transparency and comparability, and convergence of the assessment of insurer solvency worldwide. Transparency of the solvency regime is supported by explicitly indicating the overall level of safety required of an insurer in meeting its insurance obligations. Comparability and convergence will be enhanced if the solvency regime in a jurisdiction is explicit regarding the level of safety required.

17. The overall IAIS philosophy on the assessment of insurer solvency is risk-based. More specifically, the formulation of regulatory financial requirements should follow from a coherent and systematic risk analysis.

18. The origin and *raison d'être* of insurance is the assumption, pooling and spreading of risk, so that the (financial) consequences of misfortune or adversity may be borne by a community or larger group rather than at an individual level. This most basic risk in insurance is commonly called underwriting risk⁶. A thorough understanding of risk forms the basis of insurance business.

19. The *raison d'être* of insurance supervision is the protection of the legitimate interests and reasonable expectations of policyholders and other beneficiaries, within the context of promoting a stable, fair and competitive financial market. These objectives, equally, require a thorough understanding by the supervisor of the risks associated with insurance and the managing of an insurance business. It is of particular relevance for insurance supervision that in insurance business the majority of premiums are received well before the payment of benefits (or claims) is due⁷. Insurance markets can only operate effectively if confidence can be maintained that benefits will be paid as and when due. This requires *inter alia* a sufficiently precise calculation of technical provisions and capital adequacy, and the safekeeping of the assets necessary for the payment of the benefits.

Structure Element 2:

Risk sensitive regulatory financial requirements should provide incentives for optimal alignment of risk management by the insurer and regulation.

20. The IAIS firmly holds the view that it is first of all the responsibility of the insurer to manage its risks under both normal and adverse circumstances, so that policyholder interests are protected during ongoing operations and in the event of run-off or insolvency. The role of the regulatory regime and the supervisor is to see to it that this responsibility is met. The regulatory regime and supervisor should thus give insurers the opportunity to manage their business and provide incentives for sound risk management appropriate to the size and nature of their business. It should require insurers to assess and manage the risks to which they are exposed and appropriately assess and maintain their total financial resources. The IAIS also emphasises that an insurer itself, in managing its business, should seek to translate its risk exposure as far as practicable into quantitative measures which provide a sound and consistent basis for the setting of premium levels, determining technical provisions and deciding on the economic capital it finds optimal from its risk management perspective. By requiring insurers to do this, supervisors can effectively achieve their aims of

⁶ This term is sometimes used interchangeably with the terms insurance risk or insurance technical risk. This paper uses the term underwriting risk, in accordance with the terminology used by the IAA. Please note that the term 'underwriting risk' as used by the IAA has a broad meaning, e.g. also including claim liability estimation and expense risks.

⁷ This is also known as the 'inverse production cycle'.

protecting policyholders and maintaining well-founded market confidence. These aims require prudent levels of total financial resources to be held by insurers, which in turn requires that risks are measured properly. Prudence and economic valuation therefore go hand in hand with modern risk measurement and management practices.

21. Hence, a regulatory regime should be risk sensitive and seek an optimal reflection of risk exposure in regulatory financial requirements. Risk sensitive regulatory financial requirements should enable an alignment of risk management by the insurer and regulation, and support the relationship between internal economic capital and required regulatory capital.

22. A regime necessarily comprises both qualitative and quantitative aspects. For each of the broad risk categories distinguished, any quantitative financial requirements or limits need to be firmly embedded in a wider context of qualitative requirements to manage risks. Risk sensitive financial requirements can only fulfil their intended role if the insurer meets sound governance, market conduct and public disclosure requirements. Risks that are reflected in quantitative financial requirements still need to be subject to an appropriate qualitative set of norms. For example, requirements for the determination of technical provisions and capital need to be supported by requirements that secure the adequate safekeeping of the assets and control over the capital resources⁸.

3.1.2 Financial requirements appropriate to the type of risk

Cornerstone II: the solvency regime is sensitive to risk, and is explicit as to which risks, individually and in combination, lead to a regulatory financial requirement and how they are reflected in the requirement.

Cornerstone III: the solvency regime is explicit on how, for each of the risks that attract a financial requirement, individually and in combination, prudence is reflected in these requirements.

23. The IAIS recognises that the types of risk affecting an insurer's obligations and overall financial condition may be categorised in various ways and levels of granularity. This Structure paper utilises the broad categorisation proposed by the International Actuarial Association (IAA)⁹, which identifies five main types of risk: underwriting risk, credit risk, market risk, operational risk and liquidity risk. There is a clear relationship between this risk categorisation and the requirements for solvency assessment, as elaborated in this Structure paper. The IAA risk categorisation systematically represents the main risk factors, whilst the Framework, Cornerstones and Structure papers introduce and discuss the main ways to manage these risks and reflect them in solvency assessment.

24. The IAIS notes that some types of risk generally lend themselves readily to robust quantification and the subsequent translation of risk into some form of risk sensitive financial requirement. For other risk types, however, such quantification and determination of risk sensitive regulatory financial requirements is less straightforward or not possible in a sufficiently robust manner at this point in time. Even so, the gathering of information and the

⁸ Refer to sections 3.2 and 3.3 for further discussion of Governance and Market Conduct requirements in the context of the Solvency Structure.

⁹ See *A Global Framework for Insurer Solvency Assessment, A Report by the Insurer Solvency Assessment Working Party of the International Actuarial Association, 2004*, available on the IAA website: www.actuaries.org

development of methodologies for improving the measurement of all risks should be encouraged.

25. The IAIS acknowledges that some regulatory requirements may need to be set where a sufficiently robust quantification of risk may not be achievable or practical. These requirements may take the form of, for example, ratios based on simple proxies for a risk exposure, or regulatory limits to certain risk exposures. Any such requirements will need to be sufficiently prudent and, where possible, be based on an appropriate financial or insurance model. The justification for and the level of any limits should be transparent.

26. Supervisory assessment of particular insurers may also identify risks that are not adequately provided for by the insurer, e.g. in respect of corporate governance or market conduct, or by the standard regulatory financial requirements in the supervisory regime. In order for the regime to be fully risk sensitive it is important for the supervisor to have the ability to require the insurer to hold additional¹⁰ capital or to take additional safety measures as needed to protect policyholders through ongoing operations and to provide enough funds to support partial or full withdrawal from marketplace activities and winding-down operations.

27. A supervisory regime could thus, in summary, use some or all of the following:

- regulatory financial requirements, ranging from sophisticated risk sensitive requirements to simple ratios or even nominal minimum requirements including necessary safety measures
- quantitative limits to risk exposures
- qualitative requirements
- additional quantitative or qualitative requirements arising from supervisory assessment.

These approaches align with the measures that an insurer would be expected to use in its own risk and capital assessment and possible development of internal models.

28. Fully risk sensitive regulatory financial requirements are superior to fixed ratios or limits, since they provide the proper behavioural incentives for managing risk in an insurance business. Further, they may help to avoid regulatory arbitrage and, provided requirements are proportionate, unnecessary use of resources. A suitable balance may need to be achieved in practice, e.g. quantitative limits may be easier to apply but qualitative requirements may be more flexible and have wider scope. Standard requirements need to be feasible for all insurers in the jurisdiction.

Structure Element 3:

A solvency regime should address all relevant potentially material risks, including underwriting risk, credit risk, market risk, operational risk and liquidity risk. All risks should, as a minimum, be addressed by the insurer in its own risk and capital assessment.

- ***Risks that are generally readily quantifiable should be reflected in sufficiently risk sensitive regulatory financial requirements.***
- ***For risks that are less readily quantifiable, regulatory financial requirements may need to be set in broad terms and complemented with qualitative requirements.***

¹⁰ i.e. in addition to the standard regulatory financial requirements.

29. In practice, underwriting risk, market risk and credit risk generally lend themselves readily to sufficiently precise quantification and, subsequently, translation into risk sensitive regulatory financial requirements. The IAIS notes in this respect that the availability and robustness of data for these risk categories may vary to some extent from jurisdiction to jurisdiction and between lines of business. The quality of data available also impacts on the robustness and reliability of modelling approaches and valuation methods available to the insurance industry, in particular for low frequency-high impact lines of business. The IAIS firmly holds the view, however, that as a minimum these risk categories should be addressed by the insurer in its own risk and capital assessment and be reflected in sufficiently risk sensitive regulatory financial requirements. This view builds on the IAIS view on risk management by insurers, including the need for an insurer to prepare an adequate risk analysis and consider premium, technical provisions and capital requirements before offering an insurance product or entering into a (re)insurance contract.

30. The IAIS recognises liquidity risk and operational risk are less readily quantifiable. Operational risk, for example, is diverse in its composition and depends on the quality of systems and controls in place; this risk, in particular, may suffer from a lack of sufficiently uniform and robust data and well developed valuation methods. Jurisdictions may choose to base minimum regulatory financial requirements for these risks on some simple proxies for risk exposure, or prefer to rely on exposure limits and/or qualitative requirements¹¹. However, the IAIS envisages that the ability to quantify these risks will improve over time as more data become available or improved valuation methods and modelling approaches are developed. Further, although it may be difficult to quantify these risks, it is important that an insurer nevertheless addresses both liquidity and operational risk in its own risk and capital assessment. The options open to a solvency regime to address operational and liquidity risk, and the need to provide the right incentives to management, will be considered by the IAIS in further work, as indicated in the final section of this paper.

3.1.3 Risk characteristics and components

31. Risks need to be further analysed according to their characteristics to set risk-sensitive regulatory financial requirements and to establish the principles for the determination of technical provisions and required capital. This section focuses on underwriting risk, credit risk and market risk. As stated above, these risk types may generally be considered to be readily quantifiable compared with the other main risk types, operational and liquidity risk. To develop a more detailed view on risk characteristics, it is helpful to introduce the concepts 'diversifiable' and 'hedgeable'. Another important characteristic is the time horizon over which a risk extends in an insurance context, and this is addressed later in this section.

Diversifiable risks

32. The term 'diversifiable' refers to the ability to combine a risk with other risks, to which it is not fully correlated, to reduce the overall level of risk. The concept of diversification applies at different levels, namely within a risk factor, and between risk factors. For example, the IAA distinguishes the concepts of 'volatility risk' and 'uncertainty'. It defines volatility risk as "the risk of random fluctuations in either the frequency or severity of a contingent event"...This risk is "diversifiable", meaning that the volatility of the average claim amount declines as the block of independent insured risks ... increases.'. It defines uncertainty as 'the risk that the

¹¹ Please also see section 4 on Supervisory assessment and intervention

models used to estimate the claims or other relevant processes are mis-specified or that the parameters within the models are mis-estimated. Uncertainty risk is non-diversifiable meaning that it cannot be (relatively) reduced by increasing portfolio size.¹²

33. The risk exposure of a risk type may be partly diversifiable and partly non-diversifiable. For example, increasing the portfolio size of a term life assurance product may be expected to decrease the (relative) volatility of the outcome. However, uncertainty about the overall development of mortality remains. As another example, increasing the number of different shares in an equity portfolio may be expected to decrease the volatility of the value of the portfolio to some extent, but the overall market fluctuations (of say an equity index) remain.

Hedgeable risks

34. A risk is 'hedgeable' if it can be avoided by an offsetting measure or transaction. Hedging may be achieved through e.g. the use of derivative financial instruments, or more traditionally by the technique of designing a portfolio of financial assets with cash flows that offset other cash flows in certain scenarios. Hedging may be full or only partial. An interest rate guarantee is an example of a risk in an insurance contract that may be hedgeable but not diversifiable within a homogeneous block of business.

35. The level of risk may thus be reduced through diversification by combining exposures that are less than 100% correlated. Risks are diversifiable through aggregation up to the point where effectively only the systematic 'uncertainty' remains. This residual uncertainty cannot be diversified through simple aggregation, but may possibly be reduced through hedging.

36. The analysis in this Structure paper relates to both direct insurance and any ceded or accepted reinsurance. It should be noted that in this context, reinsurance also has a hedging effect, but generally differs in nature from hedging in deep liquid financial markets.

Voluntary and inherent risks

37. An important distinction in considering 'hedgeable' risk is whether a risk is 'voluntary' or 'inherent' in character i.e. whether the risk exposure is a direct, inherent consequence of taking on insurance risks, or is due to subsequent decisions by the insurer. For example, an insurer could aim to hedge its policy obligations, by cash flow matching or through the use of financial instruments and bear the cost of hedging, or may prefer a deliberate (i.e. voluntary) asset-liability mismatch exposure to give it opportunities for greater profit.

Components of risks

38. Underwriting risk may be broken down into 'pure' underwriting risk (non-behavioural), and policyholder behaviour dependent risk, where policyholders may exercise options embedded in the insurance contract. Policy obligations may also be subject to inflation risk. Insurance contracts may, similarly, contain options that the insurer can exercise. Market risk may be broken down into components such as interest rate risk, equity risk, real estate risk, exchange rate risk etc.

39. Fluctuations of these components may impact differently on the balance sheet, also depending on the product structure. For non-participating life products, interest rate risk

¹² It is noted that the distinction between 'diversifiable' and 'non-diversifiable' is not the same as the distinction between 'volatility' and 'uncertainty' risk.

impacts on both sides of the balance sheet, whilst equity risk may impact on only the asset side. For participating or with-profits products both sides of the balance sheet may be affected to varying degrees by most risks, depending on product design and policyholder reasonable expectations, including the timing of distributions to policyholders¹³. For example, equity risk may also have a corresponding effect on liabilities, due to a close linkage between asset performance and liabilities or because of management discretion to adjust bonuses in line with investment performance. For unit-linked products, both sides of the balance sheet are normally affected simultaneously by asset-related risks (market and credit risk), but the risk borne by the policyholder may depend again on the particular product design.

3.1.4 Total balance sheet approach

Structure Element 4:

A total balance sheet approach should be used to recognise the interdependence between assets, liabilities, capital requirements and capital resources and to ensure that risks are fully and appropriately recognised.

40. The IAIS recognises the need to assess the overall financial position of an insurer based on consistent measurement of assets and liabilities and explicit identification and consistent measurement of risks and their potential impact on all components of the balance sheet. This is consistent with the principle of defining an explicit overall level of safety required of an insurer in meeting its insurance obligations. Both technical provisions and capital requirements should be covered by adequate and appropriate assets. The amount of the assets minus the amount of the liabilities¹⁴ (referred to in this paper as the available capital) should exceed the required capital for solvency purposes. In this context, the IAIS uses the term total balance sheet approach to refer to the recognition of the interdependence between assets, liabilities, capital requirements and capital resources, recognising that this is fully consistent with the total balance sheet concept as adopted by the IAA¹⁵. It is noted that the total balance sheet approach is an overall approach rather than a particular methodology.

3.1.5 Valuation and market consistency

Cornerstone IV: the solvency regime requires a valuation methodology which makes optimal use of and is consistent with information provided by the financial markets and generally available data on insurance technical risks.

41. Insurer management, regulation and supervision need to be firmly rooted in economic valuation¹⁶. Only a current economic valuation of assets, obligations and risk exposures

¹³ Please also see section 3.3.on Market Conduct for further comment on participating products.

¹⁴ Liabilities include technical provisions and other liabilities.

¹⁵ The IAA adopts the concept of total balance sheet in the following context – “an insurer’s financial strength for solvency purposes requires appraisal of its total balance sheet on an integrated basis under a system that depends on realistic values, consistent treatment of assets and liabilities and does not create any hidden surplus or deficit.” (Reference: *A Global Framework for Insurer Solvency Assessment (2004)*).

¹⁶ Economic value is the value of asset or liability cash flows, derived in such a way as to be consistent with current market prices where they are available, or using market-consistent principles, methodologies and

related to all balance sheet items can provide sufficiently relevant and reliable information and insight into the financial position of the insurer. The valuation should optimally reflect the risk characteristics of the portfolio. The solvency regime should thus require a valuation methodology which makes optimal use of and is consistent with information provided by the financial markets and generally available data on insurance technical risks together with data on the risks inherent to the specific portfolios being valued. This also does not stand in the way of using company-specific data or internal models where they are considered appropriate and are able to be substantiated (please refer to Structure Element 6 and paragraph 85). Indeed, where financial markets provide only limited information useful for valuing insurance obligations, the solvency regime should recognise that portfolio specific data may provide the most relevant information for making an economic valuation of a specific portfolio.

42. An economic valuation is market consistent in that it is consistent with the assessments by market participants of value and risk or the principles, methodologies and parameters that market participants expect to be used. Economic values may be derived directly or indirectly from the observed prices at which instruments are traded in the financial markets. Only deep liquid markets provide directly observable, relevant and reliable market values. In other cases, any prices observed might not equal a true market value: obviously transaction and other costs have to be considered, but also any prices observed represent a value agreed by the seller and a purchaser. This may differ for a third party because some risks, rights or obligations impact the third party differently.

Structure Element 5:

Insurance contracts are written in the expectation that obligations under them will be settled with the claimant or beneficiary. The vast majority of obligations are discharged by insurers through settlement of insurance contracts rather than the transfer of obligations to another insurer.

In the absence of deep liquid secondary markets that provide sufficiently robust values of insurance obligations, elements of insurance obligations should be valued using cash flow models or other methods that reflect the settlement of the insurance obligations and accord with principles, methodologies and parameters that the market would expect to be used. Such valuations could be considered to be "market consistent".

Such valuations provide consistency with the other elements of the balance sheet for which reliable market values are available and with the assessments made by market participants of value and risk.

43. Insurance obligations will almost always contain elements that need to be marked-to-model where market prices for the underlying risks are not readily available. The concept of economic valuation of insurance obligations does not require or imply a view that these obligations are frequently traded in deep liquid secondary markets. It rather assumes that information from public financial markets is used to arrive at an estimated value for the

parameters. (Source: Comité Européen des Assurances –Groupe Consultatif Actuariel Européen, *Solvency II Glossary (Draft April 2006)*).

obligations which is consistent with the market price of financial assets traded in liquid and transparent markets.

44. The economic valuation of insurance obligations is conceptually based on the settlement notion. Insurance contracts are written in the expectation that the insurance obligation will be settled with the claimant or beneficiary, and the vast majority are discharged by the insurer through settlement rather than through transfer. The IAIS stresses that any transfer would need to be made to an entity capable of accepting the transfer which, in the case of a regulated industry like insurance, implies that the transferee would also need to be regulated and capable of settling the obligation to the claimant/beneficiary. Accordingly, the IAIS believes that any transfer notion would be strongly influenced by the settlement obligations that the transferee would undertake¹⁷ and that therefore, the value of insurance obligations based on transfer price can be considered to be conceptually based on the settlement notion.

45. The economic value of insurance obligations for which prices cannot be directly observed is therefore defined as the sum of the current estimate of the cost of meeting the obligations and the risk margin determined using principles, methodologies and parameters that the market would expect to be used. Such valuations could be considered to be "market consistent"¹⁸. In this context, the risk margin is defined as the amount which is necessary in addition to the current estimate of the cost of meeting the obligations, so that an insurer would be willing to take on or retain the obligations. The risk margin above the current estimate of policy obligations is based on an integral risk/return view on uncertainty regarding the cash flows resulting from the contract portfolio and the costs of holding further risk bearing capital. Hence, given that risk bearing capital is available, the risk margin in this context is conceptually similar to the market value margin required in relation to an insurance portfolio in the context of public financial reporting. The methodology for calculating the risk margin as a proxy for the market value margin should be determined with reference to market participants' methodologies (e.g. industry or actuarial standards).

46. The market consistent value of the insurance obligations can be determined using different techniques, or a combination thereof, applied to different components of obligations and risks:

- if the insurance obligations are traded in a deep and liquid market the observed prices can be used to arrive at a market consistent value. The ascertainability, relevance and reliability of the prices should be taken into account when deriving the market consistent value.
- if the cash flows associated with the insurance obligations can be replicated¹⁹ using financial instruments, the market value of the replicating financial instruments can be used.
- if the cash flows associated with the insurance obligations cannot be replicated perfectly, then the remaining risk gives rise to a risk margin. To be market consistent, this risk margin has to be based on a methodology which delivers a proxy determined

¹⁷ This statement is taken from the Second Liabilities paper of the IAIS – paragraph 11

¹⁸ It should be noted that in some limited circumstances it may not be possible to separately determine the current estimate of the cost of meeting an obligation and the relevant risk margin so that the market consistent value and the current estimate need to be derived separately rather than the risk margin directly. For example, in the case of some obligations with embedded options that are valued using replicating financial instruments or similar techniques.

¹⁹ Please also see paragraph 64.

on market consistent valuation principles and reflects the uncertainty or unavailability of market information.

47. This approach to valuation is sometimes termed the 'components approach', referring to the view that risk components should be valued at market value where such a value is ascertainable, relevant and reliable; other components may need to be valued using marked-to-model methods. It should be noted that where there isn't a deep liquid market from which to determine a market consistent value for a risk component, the additional liquidity risk should be considered in determining technical provisions.

Structure Element 6:

A market consistent valuation of technical provisions should be based on the risk characteristics of the portfolio rather than the characteristics of the specific insurer holding the portfolio. However it may be appropriate to use assumptions that reflect aspects of the insurer's specific business model and practices where they can be sufficiently substantiated.

48. Within a market consistent valuation approach it should, other things being equal, in principle make no difference which insurer is responsible for meeting the policy obligations, and there should not be any opportunities for inappropriate comparisons or for arbitrage. The technical provisions should be based on the risk characteristics of the portfolio and not on the characteristics of the specific insurer holding the portfolio. On this basis, the technical provisions for a particular portfolio of policies should be equal for any insurer and, consequently, the policy obligations may be transferred between insurers without a change in their value. In principle, the amount of technical provisions for a 'run off' or settlement approach is the same as the amount for a 'transfer approach', as the assuming insurer (transferee) should equally be able to run-off the portfolio (refer paragraph 44).

49. However, it is important to note that in practice the characteristics of the portfolio originally underwritten by an insurer will also reflect aspects of the insurer's specific business model and practices, particularly for example with regard to underwriting, claims handling and expenses. As far as these are sufficiently substantiated as representative of the portfolio, indicative of general market practice for the specific business practices applied and relevant and reliable for determining market consistent values, such specific characteristics should be taken into account in determining and assessing the adequacy of the technical provisions.

50. Another important aspect where the value of the insurance portfolio may be influenced not just by the insurance obligations, but by the characteristics of the balance sheet of the insurer as a whole, is in the case of with-profits life insurance, where the technical provisions may contain an amount that reflects the value of future discretionary bonuses. In such cases, the value of the insurer's insurance obligations may no longer be ascertainable in isolation from its assets portfolio.

51. Valuation principles and methods that optimally reflect the available information should be applied. Valuation of technical provisions solely on the basis of premiums charged to the policyholder reflects the terms on which risk has been transferred from individual policyholders to an insurer but generally provides an unreliable indication of the value of an insurer's current obligations or the terms on which these obligations can be transferred to other insurers. The premium charged will inter alia reflect the market cycle which is driven by considerations other than the value of obligations attaching to the policy. Instead, the valuation needs to be prospective, looking at the obligations to be met, rather than retrospective, looking at the premiums charged which may or may not turn out to be adequate to cover the costs of meeting the insurance obligations. However, the actuarial or

other analysis of the prospective cost of the insurance obligations underlying the premium charged often provides useful valuation information, especially in the short term.

52. The solvency regime should recognise that there is a time value of money. The time value of money for a specified cash flow of a term covered by the yield curve is expressed by discounting with a risk-free discount rate appropriate to the term of the cash flow being valued, thus utilising the entire yield curve, or rather more precisely, the zero coupon interest rate term structure²⁰. The time value of money is thus not dependent on any specific company business model, including the actual portfolio of assets held, or product structure, but based on directly observable market data and of a general nature. For some products the insurance obligations may be impacted by investment returns of particular assets; this issue is distinct from the issue of time value of money and will be considered in further work.

53. Reconsideration of data and assumptions should take place every time the financial position is determined and assessed. Observable data, such as interest rates, equity prices and inflation rates may be expected to be different each time the financial position is determined. Any modelling assumptions should be based on current data and the most credible current assumptions, and be reconsidered and revised where fresh data would indicate that a revision is appropriate. This will ensure that appropriate allowance is made for developments.

3.1.6 Determination of current estimate

Cornerstone VI: the solvency regime requires the determination of a 'best estimate' of the costs of meeting the obligations arising from the insurance portfolio, taking into account the time value of money, determined by reference to the relevant risk-free interest rates on the financial markets.

54. The Cornerstones paper notes that a solvency regime should require an insurer to determine the current (or best) estimate of the costs of meeting policyholder obligations taking into account the time value of money. As indicated above, the economic value of an insurance obligation for which prices cannot be directly observed is defined as the sum of the current estimate of the cost of meeting the obligation and the risk margin determined using market consistent principles, methodologies and parameters. Explicit determination of the current estimate of policy obligations supports the objectives of transparency and comparability and also supports convergence.

3.1.7 Role of technical provisions and capital

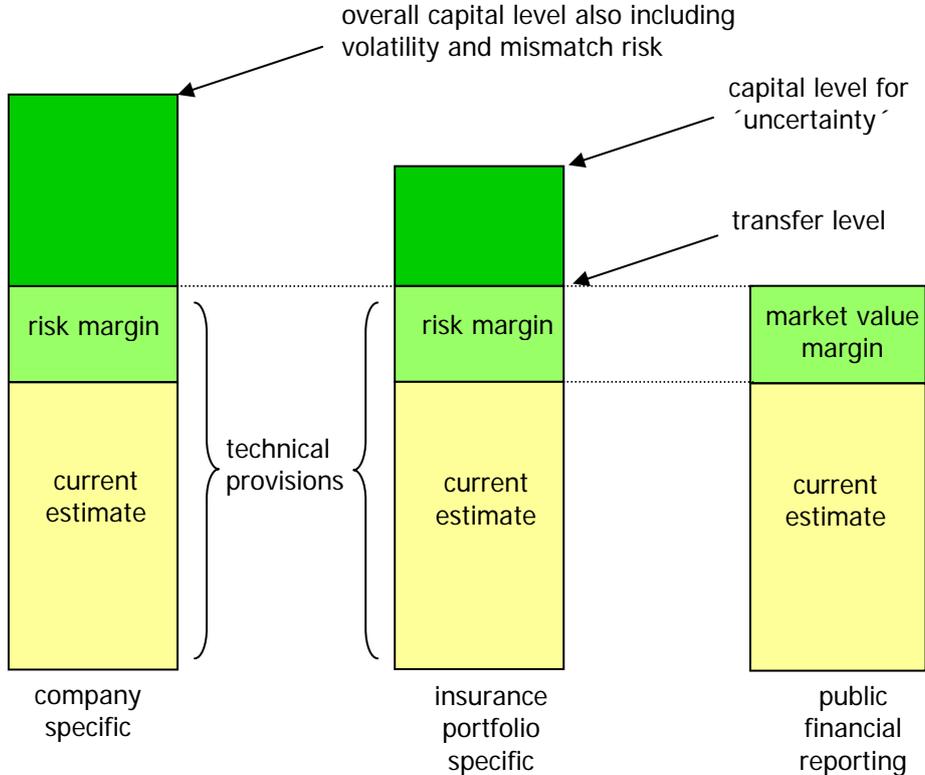
55. Technical provisions and capital have related but distinct roles in a solvency regime. This requires a clear and consistent definition of both elements. Figure 2 illustrates that the overall capital requirement depends on both the portfolio characteristics and company specific choices with respect to its asset-liability mismatch position, as outlined in the analysis in the following section²¹. The overall capital requirement is thus directed at the specific insurer and the left hand column illustrates that the overall capital requirement is driven by both inherent uncertainty and avoidable risk exposure. The middle column illustrates the level of capital due to only inherent uncertainty. The right hand column reflects

²⁰ Please see paragraph 67 for cash flows extending beyond the term of available assets.

²¹ Please note that operational risk and liquidity risk have not yet been discussed here, nor the issue of imposing any nominal floor value for capital requirements.

the interrelationship between the prudential assessment of insurer solvency and public financial reporting.

Figure 2: Main concepts for current estimate policy obligations, risk margin and capital requirements



Cornerstone V: the solvency regime includes the definition of technical provisions. Technical provisions have to be prudent, reliable, and objective and allow comparison across insurers worldwide. Technical provisions include an explicit risk margin.

Structure Element 7:
Given the intrinsic uncertainty of insurance obligations, the technical provisions need to include a risk margin over the current estimate of the cost of meeting the policy obligations. The risk margin should be calibrated such that the value of the technical provisions is equivalent to the value that an insurer would be expected to require in order to take over the obligations²².

56. Technical provisions represent the amount that an insurer requires to fulfil its insurance obligations and settle all commitments to policyholders and other beneficiaries arising over

²² This statement is taken from the Second Liabilities paper of the IAIS – paragraph 57.

the lifetime of the portfolio²³. The value of the technical provisions should be based on the notion of a full settlement, as referred to in Structure Element 5, and so should not be reduced to reflect a cost of default component that may apply in circumstances where obligations are sold at a value less than that which reflects full settlement, rather than transferred to another insurer (at a market consistent value).

57. The risk margin as part of the technical provisions for the protection of policyholders may therefore be viewed as a potential source of remuneration for the assuming insurer in the case of transfer or for the providers of capital to the present insurer.

Structure Element 8:

From a regulatory perspective, the purpose of capital is to ensure that, despite adverse conditions, policy claims and obligations will still be met as they fall due and the required technical provisions remain covered.

58. Capital provides further safeguarding of the policyholders by 'protecting' the technical provisions and the assets backing them: the technical provisions themselves may need to be increased as a result of such adversity. Capital also differs from technical provisions in that it comes with obligations to the capital providers²⁴. Such obligations to capital providers, however, are subordinate to the insurer's obligations to policyholders.

59. The IAIS emphasises that the requirements of a solvency regime are not meant to imply that no further financial injections would be necessary under any circumstances; they imply that total financial means required and available at any moment in time should be sufficient to ensure an adequate protection of policyholders. The same applies to a transfer of a portfolio: the accepting party may in future need to inject further capital. The transferring insurer would be released from the capital requirement whilst the assuming insurer would at the same time be required to provide capital.

3.1.8 Underwriting risk in technical provisions and capital

Structure Element 9:

In a market consistent valuation methodology, technical provisions should be calibrated based on assumptions about diversification of the relevant risk factors which are consistent with market assumptions. Lack of diversification within a risk factor, relative to these assumptions, should be reflected in (increased) required capital, not in technical provisions.

Therefore, volatility in underwriting risk greater than used to calibrate the technical provisions should be covered by capital requirements and not technical provisions.

60. Technical provisions need to include a risk margin over the current estimate policy obligations, given the intrinsic uncertainty of insurance obligations. The risk margin should reflect only risks that are inherent in the policy obligations being valued. This does not imply,

²³ This includes costs of settling all commitments to policyholders and other beneficiaries arising over the lifetime of the portfolio of policies, the expenses of administering the policies, the costs of hedging, reinsurance and the costs of capital required to cover the remaining risks.

²⁴ Available capital may not always come with obligations to 'third party' capital providers e.g. in the case of mutuals.

however, that all such inherent uncertainty in underwriting risk is necessarily reflected just in technical provisions²⁵. It is also reflected in required capital. The determination of the technical provisions is driven by the characteristics of the insurance obligations and undertaken with reference to the market-wide relevant risk-free interest rate term structure, and is thus not dependent on any company specific asset-liability management strategy. This also enables a natural distinction to be made, when allocating risks between technical provisions and capital, between results from underwriting and voluntary exposure to investment risk.

61. In a market consistent valuation methodology, technical provisions should be calibrated based on assumptions about the level of diversification of the relevant risk factors which are consistent with those expected to be made by market participants in assessing the value of the portfolio. For example, in the case of underwriting risk this corresponds to the level of concentration of risk which can be absorbed by the market at zero cost; a residual market level of volatility may remain which cannot be absorbed in the market at zero cost. Markets do not need to charge for unnecessary lack of diversification within a risk factor. Hence this lack of diversification, relative to the market assumptions, can and should be ignored when valuing the insurance obligations. A relative lack of diversification within a risk factor should be reflected in (increased) required capital, not in technical provisions²⁶. Since parameters that are not observable in the market and models play an essential role in the measurement of insurance obligations and the calibration of capital requirements, the use of a common reference framework or market norm for these purposes is appropriate to ensure that modelling and parameter risk are reflected appropriately in both technical provisions and capital requirements. In certain circumstances, it may be appropriate to use assumptions that reflect aspects of the insurer's specific business model and practices where they can be sufficiently substantiated. The IAIS will address these issues in further work.

62. The technical provisions, consisting of the current estimate policy obligations and a risk margin, thus relate in the first instance to remaining inherent uncertainty in underwriting risk and a residual market level of volatility²⁷ as included in the common reference framework. As stated, this does not imply that all such inherent uncertainty in underwriting risk is necessarily reflected just in technical provisions. If it were it would not be in line with the risk-return considerations of the insurance industry in the assumption of underwriting risk, and thus conceptually not be consistent with a market based valuation methodology for the technical provisions. Consequently, prudential regulation and supervision should impose a further appropriate capital requirement for underwriting risk.

63. An insurer should analyse the underwriting risk to which it is exposed over the full time horizon of the insurance contracts. Where there is more uncertainty about the underlying insured risks, including their level, trend or distribution, over this time horizon a higher risk margin over the current estimate will be required. It is crucial that an insurer take a consistent approach in the valuation of its underwriting risk, be it in the actuarial calculation of premiums, the determination of technical provisions, reinsurance contracts and in portfolio transfer.

²⁵ Please also see paragraph 62 and paragraph 73.

²⁶ This point may be illustrated quite readily by considering a number of examples, e.g. a person buying the same policy at two different insurers, quota share arrangements or reinsurance. A reflection of this volatility risk due to insufficient portfolio size in technical provisions would also generate arbitrage opportunities.

²⁷ This residual market volatility relates to the additional volatility of the risk in relation to a portfolio due to it being less diversified than is assumed for the reference market for determining market consistent values as outlined in paragraph 61.

3.1.9 Asset-liability mismatch risk in technical provisions and capital

Structure Element 10:

Mismatch risk exposure which is not intrinsic to the policy portfolio and is assumed voluntarily by the insurer should be reflected in required capital, and not in the technical provisions.

64. In the following analysis the term asset-liability mismatch risk (mismatch risk) is used to describe the risk related to changes in the value of the assets vis-à-vis the insurance obligations. 'Mismatch risk' includes the market risk and the credit risk associated with the assets relative to the liabilities. In analysing mismatch risk consideration of a 'replicating portfolio' - i.e., a portfolio of financial instruments which are traded in a deep, liquid market, with cash flow characteristics matching either the expected cash flows of the policy obligations or, more generally, matching the cash flows of the policy obligations under a number of financial market scenarios - is helpful. It is acknowledged that it may not be possible in practice to have a replicating portfolio that provides a fully matched position under all financial market scenarios. However for the purpose of the analysis below to develop Structure Elements it is assumed that it is possible to develop and implement such a replicating portfolio. That is, it is assumed that there is available a portfolio of financial instruments, which are traded in a deep and liquid market, replicating the liability structure or, a portfolio which corresponds to the investment policy stated for a unit-linked or with-profits policy.

65. An additional risk exposure may exist due to an asset-liability mismatch. In a properly attuned risk sensitive regime, these requirements also need to be calibrated to the various subcomponents of the risk exposure, e.g. interest rate risk, equity risk, currency risk, and certain components of underwriting and credit risk etc.

66. Mismatch risk exposure which is voluntary, i.e. where the cash flows related to the portfolio of insurance contracts may readily be matched in deep liquid markets, should be reflected in required capital, and not in the technical provisions. The capital requirement would be made up of the several subcomponents of risk exposure. In a market consistent valuation methodology, mismatch risk should in the first instance be calibrated based on the assumption of a market level of diversification. However, in certain circumstance, it may be appropriate to use assumptions that reflect aspects of the insurer's specific business model and practices where they can be sufficiently substantiated.

67. In some cases such ready matching is not available, e.g. where the time horizon of contracted benefit obligations extends far beyond the term of available assets. In that case there thus is inherent uncertainty in the asset-liability mismatch position. Such uncertainty may be dealt with in the same way as the uncertainty in underwriting risk, with part being included in the risk margin in technical provisions and part in a capital requirement. The IAIS will undertake further work on this issue.

3.1.10 Time horizon for calibration of technical provisions and capital

Structure Element 11:

The risk reflected in the risk margin in technical provisions relates to all liability cash flows and thus to the full time horizon of the insurance contracts underlying these technical provisions.

Capital requirements should be calibrated such that, in adversity, assets will exceed technical provisions with a specified level of safety over a defined time horizon.

68. For the determination of the technical provisions, an insurer is expected to consider the uncertainty attached to the policy obligations; that is, the insurer should consider a deviation of future experience from the current estimate over the full period of the policy obligations.

69. The determination and calibration of the capital requirements needs to be based on a more precise analysis of the concept of time horizon, distinguishing between:

- the period over which a shock is applied to a risk – the ‘shock period’; and
- the period over which that shock will impact the insurer – the ‘effect horizon’.

The two periods may be illustrated by some examples. A one-off shift in the interest rate term structure during a shock period of one year has consequences for the discounting of the cash flows over the full term of the policy obligations (the effect period). A judicial opinion in one year (the shock period) may have permanent consequences for the value of claims.

70. Capital requirements should be calibrated such that assets exceed the technical provisions over a defined shock period with a high degree of confidence, or, similarly, that the available capital can withstand a range of predefined shocks or stress scenarios²⁸ assumed to occur during that shock period²⁹. The consequences of such a stress will need to be calculated over the full effect horizon of exposure to the risk of the insurance obligations. In essence, at the end of the shock period, capital has to be sufficient so that the available resources cover the technical provisions re-determined at the end of the shock period. The re-determination of the technical provisions would allow for the impact of the shock on the technical provisions over the full time horizon of the policy obligations. Capital requirements must also reflect the lack of sufficient diversification and hence the increased volatility of the technical provisions, which also impacts over the full time horizon of policy obligations.

71. The shock period applied should consider, among other things, the time required for the insurer to meet its obligations to policyholders, either through settlement with the policyholder or transfer of the obligations to a third party. This shock period is normally much shorter than the period of the policy obligations. For practical reasons a one-year shock period has often been suggested, although a longer period with a corresponding degree of confidence or set of stress tests may also be considered. If a risk is optional to the insurer rather than intrinsic to the portfolio but cannot be unwound within the shock period normally considered for solvency assessment purposes then this should be taken into account in assessing the capital requirement. The shock period then chosen should take into account at least the period required for the risk to be unwound.

72. There is a relationship between the shock period over which a risk may emanate and the severity and form of the stress applied that seems appropriate. For example, the numerical impact on technical provisions of a change over the shock period in assumptions about a ‘mild’ deterioration arising year after year might be not dissimilar from the impact of one initial more severe shock. A shock may relate to a one-off change of level (e.g. equity index) or to a change in trend (e.g. mortality). It is important to recognise that capital and technical provisions are set at a point in time on the basis of information available at that time including information about uncertainty and risks. Scenarios considered at the end of the time horizon should also be looked at from this perspective. A scenario of a continual but mild deterioration each year over a long period would therefore be reflected in determining current capital requirements and technical provisions. As the stresses applied should adequately

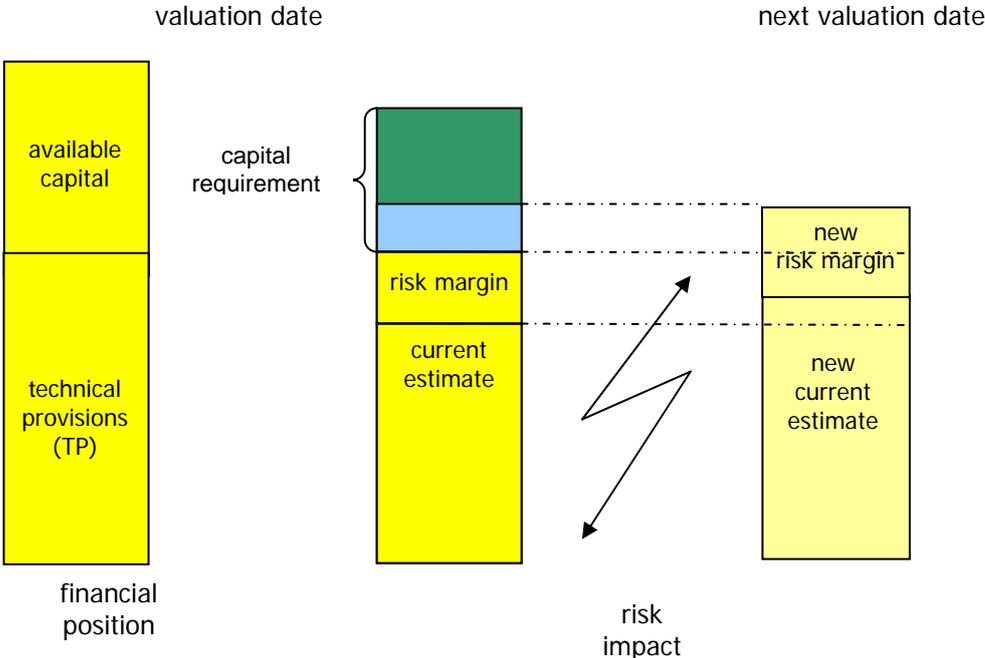
²⁸ Please note that this wording is not intended to imply a Value at Risk approach for the risk measure nor a particular calculation method.

²⁹ Please also see paragraph 78 on the issue of a nominal floor to the required capital.

represent the shock period over which such stress may be relevant, they should include an event that may arise within an extremely short period, such as a natural catastrophe.

73. Figure 3 below illustrates in a basic schematic form the calibration of capital in a solvency regime within a dynamic context. The illustration elucidates in particular that in setting capital requirements the solvency regime should take into account parameter risk (part of underwriting uncertainty) to the extent that the technical provisions at the end of the shock period (typically one year) will need to be increased to allow for the effect of shocks (such as deterioration in claims experience) that occur during the period. This does not imply that all parameter risk over the effect horizon is reflected only in the required capital - inherent uncertainty in underwriting risk over the effect horizon, including the uncertainty of the estimation process due to parameter and model error, should also be reflected in the risk margins included in the technical provisions (refer to paragraph 60).

Figure 3: Schematic illustration of determination of capital requirement



74. The period over which the shock is applied should be chosen taking into account the purpose of the capital requirement being calibrated and the nature of the business. This shock period is generally the same for all risks and enables risks of different term (effect horizon) to be combined and related to the level of safety required. It is typically set at one year for relative ease of calculation and communication of regulatory requirements but may in principle be set over a number of years with a corresponding level of safety.

75. Capital requirements should be calibrated to sufficiently stressed yet plausible adverse scenarios for each of the risk factors or a combination thereof. The scenarios should make full use of historic data, but should be forward-looking. For some risk factors it may be possible to calibrate the stress to a particular percentile³⁰ of an estimated probability density

³⁰ Please note that this 'percentile' relates to the calibration of a specific risk factor, which may be used in both the cost-of-capital approach and the percentile approach for the determination of the technical provisions outlined below. Please note that the term 'percentile' is meant to comprise not only VaR but also other risk measures, e.g. TailVaR.

function of that risk over the shock period, e.g. equity (index) risk over a one-year time horizon.

76. The calibration of the capital requirements should thus reflect the possible speed and magnitude of a reduction in actually available capital. The supervisory regime should therefore require a capital buffer that allows for sufficiently early intervention to be effective.

77. The IAIS notes here also the importance of additional analysis over a longer time horizon, such as business continuity analysis or dynamic financial analysis, addressing the combination of quantitative and qualitative elements in the medium to long term business strategy of the insurer. This would be appropriate for the insurer in assessing its own economic capital requirements and assist the supervisor in considering whether it should require capital add-ons compared with a requirement based on, say, a one year shock period.

78. It is noted, in the context of calibration of the capital requirement, that a solvency regime would be expected to impose a market-wide nominal floor to the required capital, based on considerations of governance and the need for an insurer to operate with a certain minimal critical mass. Such a nominal floor might vary between lines of business or type of insurer.

3.1.11 Capital requirements and diversification between risk factors

79. A capital requirement should be set reflecting the overall actual risk exposure of the insurer. The IAIS notes that in principle diversification may be deemed to exist between and within the mismatch risk and underwriting risk. The IAIS would thus suggest that an overall capital requirement should take into account diversification between risk factors where this can be substantiated with sufficient robustness.

80. The issue of diversification more generally will be addressed in the further standards that are to be developed. This topic is closely related to that of the definition of a common reference framework or market norm, as discussed earlier. The IAIS recognises that diversification has a number of dimensions, such as diversification within a risk factor, between risk factors within a business line, between different types of underwriting risks, between the same risk factor in different business lines etc. A further related question is whether and how diversification effects may be considered under different legal group structures, within a solvency regime that aims to be consistent and arbitrage-free. It is also recognised that in extreme circumstances correlations may increase and mutual support within groups may break down.

3.1.12 Cost-of capital approach and percentile³¹ approach for the determination of the technical provisions

81. Among the conceptual approaches currently under consideration in IAIS member jurisdictions to determine the technical provisions are the cost-of-capital approach and the percentile approach. Other approaches may be considered in the further work to be undertaken on the determination of technical provisions.

82. The cost-of-capital approach seeks to express explicitly the risk-return considerations determining the risk margin. It takes the perspective that sufficient capital is needed to be able to run-off the (existing) book of business. The cost of the risk is measured as the cost of

³¹ The percentile approach is also known as 'quantile' approach.

holding the capital required to support the inherent risks associated with the run-off of the existing portfolio of contracts, over the full time horizon of these obligations. Provided this capital requirement is risk sensitive, this approach should then properly reflect the risk inherent in the contract portfolio. It should be noted that the risk margin as 'cost of risk' in addition to the current estimate policy obligations is thus also the expected 'reward for risk' to the capital providers taking the risk, which will be released over time. The cost of capital reflects the 'excess' return over risk-free rates that capital providers may be deemed to require from an insurer as compensation for the cost of providing risk bearing capital.

83. The percentile approach seeks to determine the technical provisions at an amount so that the insurance obligations can be met (by the technical provisions) with a predefined confidence level ('percentile'). This approach also endeavours to provide 'directly' the same level of policyholder 'protection' across companies by setting this percentile. This approach thus needs to establish a probability density function of the insurance obligations taking into account uncertainty in underwriting risk over the full time horizon of the contract portfolio.

84. The IAIS will undertake further work analysing these two approaches, and other approaches that are identified as part of that work, and the way in which they may be implemented in practice. This work will build on the study being undertaken by the IAA, as described in more detail in the Roadmap paper. The IAIS will consider the main approaches in the light of the philosophy and criteria presented in this and its earlier papers, such as market consistency of valuation, risk sensitivity, and transparency and comparability.

3.1.13 Use of standardised and more advanced approaches, including internal models

Cornerstone VIII: the solvency regime allows a set of standardised and more advanced approaches to determine the solvency requirements, and includes the use of internal models if appropriate.

85. The IAIS advocates the appropriate use of internal models. Where the insurer has an internal model that better reflects its risks than the standard approach, and is integrated into its risk management and reporting, the solvency regime could allow the use of such available information to determine a more tailored solvency requirement. This would be subject to prior approval by the supervisor based on a transparent set of criteria and would need to be evaluated at regular intervals in the overall legal context within which the supervisor operates. The IAIS will undertake further work on internal models, their use and validation.

3.2 Governance Requirements

Structure Element 12:

The supervisory regime should require insurers to have and maintain corporate governance policies, practices and structures and undertake sound risk management in relation to all aspects of their business. Sound governance is a pre-requisite for a solvency regime to operate effectively.

86. Sound governance, supported by effective disclosure, is of key importance for the adequate management of the insurer and critical to the effectiveness of the regulatory regime. Some risks may be addressed only through governance requirements rather than by setting regulatory financial requirements. Hence governance requirements form one of the key blocks in the IAIS Solvency Structure as illustrated in Figure 1 in section 1.

87. The Solvency Structure assumes a dynamic risk assessment by the insurer's management. This includes that judgments are made regarding provisioning and capital adequacy. It is, first of all, clearly the responsibility of the insurer itself to fulfil its fiduciary role to policyholders and to manage its risks, value its obligations and procure sufficient capital. It is the role of the regulatory regime and its supervisor to see that this management responsibility is met and to ensure accountability.

88. Sound corporate governance and professional advice is a prerequisite of any solvency regime where financial and internal reporting, valuations and solvency assessment are dependent on an individual insurer's risk assessment and management systems. Sound corporate governance, properly designed and implemented, is the basis for supervisory verification of the ability and accountability of an insurer's Board and its management in operating effective risk management systems. It ensures that ensuing valuations and capital allocations are grounded in the insurer's actual business decision making and evaluated against portfolio, company and market experience. In particular, the solvency regime should set requirements regarding the continuing soundness of the insurer, including requirements for a forward looking medium and long term business plan, including a continuity analysis of the financial position of the insurer under a range of financial and business scenarios. Although some types of risks might be less quantifiable, the continuity analysis (either qualitative or quantitative) should encompass all the relevant risks in terms of business continuity, including operational and liquidity risk. The IAIS recognises that developments in the solvency regime in force in a jurisdiction may also impact on the formally required role and attestations of actuaries and auditors. Clear, relevant and enforceable professional standards of conduct are appropriate to ensure the objectivity and independence of auditing and actuarial professionals.

89. The supervisor should have the necessary legal and administrative powers and capabilities to enforce corporate governance policies, practices and structures.

3.2.1 Governance and the Board of directors

90. Essential to sound governance is an active and involved Board of directors. The Board should possess an appropriate degree of management, technical and other expertise coupled with the necessary stature and mindset in order to adequately perform the governance, guidance and oversight responsibilities that are critical to an effective internal control structure. A Board should be prepared to question and scrutinise management's activities, present alternative views and have the courage to act in the face of obvious wrongdoing. The Board structure and composition should ensure a critical mass of directors that are not involved in, and independent of, day-to-day management³². Non-executive directors should hold meetings both with and without executive directors with appropriate frequency.

91. The supervisor should apply, or require the insurer to apply, 'fit and proper' standards with regard to the Board and management, and maintain adequate oversight to maintain confidence on an ongoing basis in their integrity and competence to fulfil their duties.

92. The Board should establish adequate risk management policies and effect practices that, inter alia, identify risk, provide measures for risk, and define risk tolerances and limitations. Risk limits should take into account the capital position and the insurer's ability to absorb losses. Risk limits should be quantified and operational. Capital related policies should explicitly address stress testing and scenario analysis, under a range of key

³² This may be achieved under several Board structures, e.g. one-tier and two-tier Board structures, as provided for in company law applicable in the jurisdiction.

assumptions. It may be appropriate to establish a separate risk management function that would be tasked with the design and implementation of the risk strategies, monitoring and reporting. The function would have a central and sufficiently independent role in the assessment and management of the risk exposure. The risk function should have direct access to the Board. As outlined above, insurance involves a variety of risks, some of which may be quantified more easily than others. The risks may be addressed by a number of measures. Comprehensive risk assessment and management should recognise the nature and attributes of the risk factors. The IAIS stresses that sound governance practices should apply to all risks.

93. The Board should set and oversee the corporate culture of the insurer. Policies concerning honest and lawful behaviour by Board members, officers and employees and dealing with issues such as conflict of interest, interaction with customers or suppliers, due care and due diligence standards should be documented and communicated throughout the organisation as a Board expectation.

94. Attestations regarding compliance with financial accounting and reporting rules should be in accordance with the jurisdictional legislative requirements. In order to attest to compliance, the Board should establish a sufficient program of internal audit. The Board should furthermore engage an external auditor with the independence, expertise and stature appropriate to the insurer in order to ensure the accuracy of financial reporting.

3.2.2 Governance and management

95. Sound corporate governance should be firmly rooted in management, and throughout the insurer. Management should have sufficient skills and experience in relation to the insurance business. Management should possess a good understanding of the insurer's risk management, valuation and capital allocation systems. After all, management is responsible for designing, implementing and evaluating the effectiveness of such systems, including monitoring risk exposure limits adopted by the Board.

96. Management is responsible for ensuring model-based valuations and capital allocation systems function effectively by having:

- sufficient skilled and competent resources dedicated to the modelling function
- a process, including back testing and calibration to market valuations, with the aim that models and procedures have good estimation power and that valuations arrived at will not be insufficient or structurally underestimated
- a process to review data for the determination of model input assumptions
- a process to ensure model input is consistent with general data on the financial markets and company experience as appropriate
- a review of model-based valuations to find errors and limit weaknesses
- a credible ongoing effort to improve model performance
- a regular cycle of model evaluation that includes monitoring of model performance and stability, review of model relationships and testing of model outputs against outcomes
- adequate documentation of the model, valuation and capital allocation processes.

97. Management is responsible for ensuring that the insurer makes appropriate use of experts with the proper skills, knowledge and experience. Insurers should make use of risk professionals, such as actuaries. The IAIS guidance paper *The use of actuaries as part of a supervisory model* considers the use of actuaries as part of an insurance supervisory approach.

98. The above paragraphs indicate the main governance issues in relation to insurer solvency assessment. Further analysis of the issue of governance will be included in more general IAIS work.

3.3 Market Conduct Requirements

Structure Element 13:

The supervisory regime should require insurers to have sound market conduct policies and procedures. The regime should be transparent as to how policyholder expectations should be expressed and reflected in solvency assessment.

99. Market conduct requirements also form one of the key blocks in the IAIS Solvency Structure as illustrated in Figure 1 in section 1. As with governance, some risks may be addressed only through market conduct requirements rather than by setting regulatory financial requirements.

100. Market conduct requirements seek to ensure that customers are able to select the insurance product that best meets their needs. A prerequisite thereto is adequate, timely and accurate provision of information by insurers and intermediaries. To be effective, market conduct requirements may need to differentiate between retail consumers and commercial purchasers of insurance. Sound market conduct policies and procedures are also closely related to the solvency position of an insurer, and should be a key part of the risk management of an insurer. Improper market conduct may have a direct prudential impact on an insurer, or may be damaging to the reputation of an insurer and hence have severe indirect consequences for its financial position and its ability to operate effectively. Sound market conduct needs to be based on a clear understanding by the insurer of the risks covered in the policy contracts, and should be integrated into the overall risk management and governance structure of the insurer.

101. Liabilities that were not anticipated may arise if an insurance contract is unclear or if the policyholder has not been adequately informed or advised about its nature during the sales process. Market conduct requirements should, therefore, include treating customers fairly and paying attention to their information needs.

102. In particular, contract parties should be provided with timely and complete information about policy benefits, including the associated risks and expenses and the consequences of any embedded options, over the period until all obligations under the contract have been satisfied. The aim should be a shared understanding of the implications of the contract terms and so the information should be presented in a manner that achieves that aim.

103. In practice, additional obligations arising from misselling in particular have proved to be substantial in some jurisdictions. Even if selling is not carried out by the insurer, but by intermediaries, more often than not obligations may fall on the insurer itself as a result of inappropriate use by the intermediary of the insurer's literature or sale of the insurer's products. The insurer should thus ensure it has adequate selection and management processes for its sales channels.

104. The solvency regime should be transparent as to how policyholder expectations are reflected in the financial requirements. Constructive obligations³³ may arise from the exercise

³³ Constructive obligations may, subject to the particular jurisdiction and contract, be legally binding as a result of specific contract wording, past practice of the insurer and/or disclosures made to policyholders.

of discretion by insurers under insurance policies. Insurers also use such discretion to manage their risk of financial loss. The extent and nature of the insurers' discretion and of policyholders' rights may vary between policies and also between different jurisdictions. This should be taken into account in specifying the determination of technical provisions and capital requirements³⁴.

105. Sound market conduct practices are of particular importance for participating or with-profits insurance where there is discretion as to the amounts of bonus or dividend that are paid to the policyholders. Typically, a guaranteed minimum benefit is associated with such products. Unit-linked business similarly requires timely and adequate information to prospective policyholders on the investment policies that will be followed and the risks associated therewith, and the means by which fees, expenses and taxes are to be reflected in the unit price. The information should be in a form which is accessible and readily understandable. There is a potential constructive obligation if policyholders receive lower benefits because the insurer does not select investments in line with the stated investment policy.

106. Market conduct requirements should also extend to the integrity of an insurer in the area of reinsurance and as an institutional investor, and to other operations of an insurer on the financial markets, e.g. to attract capital or establish credit lines. It should be noted in this respect that reputation risk pertains to, and may have detrimental consequences for, all activities of the insurer, and may impact negatively on the insurer's solvency position.

107. The above paragraphs indicate the main market conduct issues in relation to insurer solvency assessment. Further analysis of market conduct issues will be included in more general IAIS standards³⁵.

4. Framework Level 3 - Supervisory assessment and intervention

Cornerstone VII: the solvency regime establishes a range of solvency control levels and the supervisory instruments associated with each of the control levels.

Structure Element 14:

There should be a number of solvency control levels which trigger different degrees of intervention by the supervisor in a timely manner. The solvency regime should have due regard to the coherence of the solvency control levels and any corrective action that may be at the disposal of the insurer, and of the supervisor, including options to reduce the risks being taken by the insurer as well as to raise more capital.

³⁴ The regime should, however, avoid arbitrariness. Any more detailed requirements and their implementation should thus follow in a consistent and transparent manner from a common set of principles.

³⁵ Further work on market conduct may consider issues related to insurance intermediaries and their role in selling insurance products to consumers.

4.1.1 Supervisory assessment and intervention: consequences for capital

108. Apart from failure to meet quantitative requirements, failure to meet the qualitative requirements of a regulatory regime, such as in the areas of governance, market conduct and public disclosure, may have severe direct consequences for the financial soundness of an insurer. It may also have indirect consequences, which flow from a tarnished reputation that may in turn have a considerable negative impact on the effective operation of the insurer. The IAIS advocates that any inadequacies in the operation of an insurer need to be resolved by the insurer, by addressing any deficiencies in its policies, procedures and practices. The supervisor should thus use its powers to require that the insurer satisfactorily resolves any such deficiencies, and to intervene in the management of the business if necessary. Nevertheless, as part of a risk sensitive regime, the supervisor may also use its powers, for instance, to impose an additional capital requirement for the additional risk that such deficiencies pose to the financial soundness of the insurer. Such capital requirements may be identified as a result of supervisory assessment and intervention. They are intended to ensure all risks are covered appropriately to achieve an appropriate level of confidence in the protection of policyholder obligations. Such requirements should be maintained for as long as the identified additional risks have not been rectified satisfactorily, and may thus also be expected to provide an additional incentive to the insurer fundamentally to solve any such problems.

109. An additional capital requirement might also be imposed where supervisory assessment indicates that the specific risk exposure of an insurer is not met sufficiently by the standard regulatory financial requirements in the solvency regime. The use of internal models that adequately reflect the risk exposure of the insurer may be preferable in such cases, however.

110. The purpose of capital is to achieve an appropriate explicit level of confidence that an insurer will be able to meet its obligations to policyholders. The imposition of any additional capital requirement will need to be subject to due process and be substantiated by reference to objective criteria, in accordance with the need for substantiation and objectivity of any supervisory intervention.

4.1.2 Solvency control levels

111. The methodology presented in section 3, with the concepts of hedgeable and diversifiable risk, is of direct consequence to the setting of solvency control levels. The solvency regime should set a sufficient range of solvency control levels, enabling a ladder of intervention with a proportionate set of supervisory powers and instruments for intervention by the supervisor. These solvency control levels should first and foremost reflect the overall risk exposure of the insurer. The solvency regime should have due regard to the coherence of the solvency control levels and take into account any corrective actions that may be at the disposal of the insurer and the supervisor, including, in particular, possibilities to reduce the overall risk exposure as well as to raise more capital. The time needed to take corrective action should be factored into the solvency control levels.

112. Voluntary mismatch risk and components of underwriting risk exposure may in principle be reduced by the insurer. Reducing risk will normally reduce the overall capital requirement. The control levels should consider the technical provisions and one or more capital levels covering all risks mentioned. If capital falls below the level required to cover all risks currently held, management options to reduce risk or transfer the business may need to be considered in addition to the option to raise additional capital. Figure 2 provides an indication of different points of intervention at which solvency control levels could be set.

5. Public disclosure and transparency

Structure Element 15:

The supervisory regime should specify which solvency information should be made public to enhance market discipline and provide strong incentives for insurers to conduct their business in a safe, sound and efficient manner which treats policyholders fairly.

Information provided to the supervisor and subject to confidentiality supports and fosters openness on commercially sensitive issues between the supervisor and the insurer.

The regime should be open and transparent as to the regulatory requirements in force, and be explicit about its objectives and the level of safety that it requires.

113. As indicated in section 1, disclosure may be considered as an overlay to each of the elements of the Framework. The IAIS recognises that the aims of prudential supervision and financial stability require a balanced approach with regard to disclosure.

114. A regime would be expected to differentiate between public disclosure and reporting to the supervisor which is subject to confidentiality. Information provided to the supervisor and subject to confidentiality will generally be more detailed and technical in nature. Ensuring appropriate confidentiality not only guards against disclosure of commercially sensitive information but also fosters openness between the supervisor and the insurer. The regime should require insurers to provide sufficient information to give confidence to the supervisor and the public at large that they are appropriately carrying out their responsibility to manage their risks and protect the interests of policyholders.

115. The IAIS considers public disclosure to be critical for a well balanced solvency regime, to the operation of a sound market and to achieving the aims of transparency, comparability and convergence. Public disclosure requirements in a regime are mainly concerned with public disclosure by insurers of information relevant to the assessment of solvency and financial strength. Timely and accurate disclosure on all material matters regarding the insurer, including the financial situation, performance, ownership and governance arrangements, may also be seen as part of a comprehensive corporate governance framework.

116. Public disclosure also extends, however, to the provision of information by the supervisory authorities on the regulatory regime in force. It may be expected that improved transparency and disclosure will provide impetus and act as a catalyst for convergence of regulatory regimes and supervisory assessment. To ensure the effectiveness of the solvency assessment regime in their jurisdiction, a supervisor should disclose publicly details of and the rationale for its regime. A risk sensitive regime should be explicit about its objectives and the level of safety that it requires.

117. All disclosure should be fit for its purpose, i.e. be readily accessible and expressed in terms the stakeholders are likely to understand, including explanatory notes or guidance as appropriate. A suitable balance should be struck between the amount of information, its usefulness and the cost of providing the information. In this way, public disclosure of information enhances policyholders' and the market participants' ability to make informed decisions with respect to insurers. More specifically, calculations used to assess solvency of insurers are complex and based on not only observable data but also models and assumptions, the use of which requires the application of professional judgement by the management of the insurer and their advisers. Public disclosure relative to quantitative benchmarks helps to ensure objectivity in the assessment of insurers, over time and through

market comparisons and the resolution of inconsistencies. It should be noted, though, that the present solvency position is not the only indicator of the financial condition and risk exposure of an insurer, and should not be used in isolation. Public disclosure should thus include forward-looking information to enable users to gauge better the likely viability and future financial condition of the firm.

118. It is important for transparency to show the extent to which the business is supported by technical provisions and capital. The IAIS notes in this respect that transparency requirements will strongly encourage the insurer to demonstrate it has risk bearing capital available to substantiate its ability to meet its insurance obligations with a high degree of probability.

119. Insurers should thus be required publicly to disclose appropriate qualitative and quantitative information. A regime might, for example, require public disclosure of the methodology and material assumptions for the calculation of technical provisions and capital requirements³⁶. The regime should specify requirements for the public disclosure of the analysis of the capital requirements for each broad category of risk and in aggregate, as well as any major company specific risks. A regime might require, more specifically, disclosure of inter alia the methodology of analysing risks, the analysis of changes over time, the quantification of key sensitivities and the results from specific stress tests and scenarios. Insurers should disclose how the risks are being managed including reinsurance and the use of derivatives. For more information refer to the IAIS standards³⁷ on disclosure.

120. The regime should specify which solvency information should be made public, when and how, taking into account the requirements of the capital markets, the accounting standards that apply to the insurer and the information needs of its current and prospective policyholders and other stakeholders.

121. Requirements for public disclosure should take into account whether the information is commercially sensitive, the potential for its publication to have adverse effects on insurers or to distort competition or give some insurers an unfair advantage. Such effects may be reduced or eliminated by ensuring that public disclosure requirements apply to all insurers in a regime and across different regimes in which an insurer which is supervised operates. There may also be situations where a requirement to publish information needs to be applied to other sectors to avoid undesirable effects. The public disclosure requirements in competing sectors should therefore be considered in setting those for the insurance sector in a jurisdiction.

122. The above paragraphs indicate the main disclosure issues in relation to insurer solvency assessment. Further analysis of disclosure is included in more general IAIS standards on disclosure.

³⁶ This requirement is not intended to imply that all details of internal models and associated proprietary and/or litigation sensitive information needs to be disclosed publicly.

³⁷ *Standard on disclosure concerning technical performance and other risks of non-life insurers and reinsurers* (October 2004), *Standard on disclosures concerning investment risks and performance of insurers and reinsurers* (October 2005), *Standard on disclosure concerning technical risks and performance of life insurers* (October 2006).

6. Further Work

123. The Roadmap paper envisages that, further to the Structure paper, a limited number of standards on solvency issues will be drafted, encompassing a fairly broad range of related topics. The standards will build on the concepts in the Cornerstones and Structure papers, but will also pay consideration to the fact that regulation and supervision needs to be tailored to market structure and practice, which may vary.

124. The further deliberations on, and drafting of, this Structure paper have resulted in some proposed changes to the work plan on solvency related issues as indicated in the Roadmap paper. It is still the view that more detailed requirements on the valuation of assets, the valuation of liabilities, capital requirement, forms of capital and the use and validation of internal models for solvency assessment should be developed. The IAIS proposes to progress this work through the development of standards³⁸ and guidance as follows:

- standard on the valuation of technical provisions and assets
- standard on capital requirements and resources
- standard on risk management for solvency purposes
- guidance paper on internal models.

The proposal to develop a guidance paper on internal models, in the first instance, recognises that this is a significantly new area of work for the IAIS, and an evolving area of practice/supervision for the industry. A guidance paper provides the appropriate tool for preliminary work on this issue, with the opportunity and expectation that in time, as emerging practice becomes more settled, the paper would be further developed into a Governance standard.

125. These proposed papers will be developed as a coherent set of documentation on insurer solvency assessment. The documents will fall primarily in the financial block of the framework, but pay due regard to the governance and market conduct blocks, to supervisory assessment and intervention and to disclosure requirements. As part of the consolidation of this set of documentation, it is further expected that the Structure paper will be reissued following the finalisation of these standards, to remove duplication and repetition with the content of the standards and to position the Structure Elements established within that paper as principles overarching the standards.

Financial standards and guidance papers

126. The standard on the valuation of technical provisions and assets will build on the concepts of the Cornerstones paper as elaborated in the Structure Elements of this Structure paper. The standard will focus on methodologies and methods for the determination of both the current estimate and risk margin as parts of the technical provisions, in the context of a total balance sheet approach and with due regard for the consistency of valuation of the technical provisions and the assets. It will expand on issues such as any release of risk margin over time and recognition of profit at inception, embedded options for policyholders or the insurer, including options to lapse or surrender, initial and ongoing expenses and how they should be taken into account in the determination of technical provisions. This standard

³⁸ Guidance papers may also be developed to supplement standards where required to develop and discuss more technical items – refer paragraph 129.

will also discuss how reinsurance or other forms of risk transfer may be taken into account in the determination of the technical provisions and associated capital requirements.

Figure 4: The common Structure, Standards and Guidance papers for the assessment of insurer solvency

Supervisory assessment and intervention	<p style="text-align: center;">Financial</p> <p style="text-align: center;">Standards and Guidance papers</p>	<p style="text-align: center;">Governance</p> <p style="text-align: center;">Standards and Guidance papers</p>	<p style="text-align: center;">Market conduct</p> <p style="text-align: center;">Standards and Guidance papers</p>
Regulatory requirements	<p style="text-align: center;">Standards and Guidance papers</p>	<p style="text-align: center;">Standards and Guidance papers</p>	<p style="text-align: center;">Standards and Guidance papers</p>
<p>The IAIS common structure for the assessment of insurer solvency ('Structure paper')</p>			

127. The standard on capital requirements and resources will build on the overall allocation of risk between, and the distinct roles of, technical provisions and capital requirements as outlined in this Structure paper. The standard will include a further discussion on the methodology for the determination and calibration of the capital requirements, and the setting of transparent quantitative benchmarks, focus on underwriting risk, market risk and credit risk, but also discuss possible ways to reflect operational risk and liquidity risk in regulatory requirements and current limitations to doing so. In terms of capital resources, the standard will discuss the recognition and valuation of forms of capital and set criteria for the forms of capital that may be allowed within a solvency regime. The standard will largely build on the earlier IAIS work, and be explicitly attuned to the risk-based approach underlying this Structure paper.

128. The Structure paper sets out the overall principles of the allocation of risk between, and roles of, technical provisions and required capital, focusing on underwriting risk and the asset-liability mismatch component of credit and market risk. The standard on risk management for solvency purposes will consider more detailed conceptual issues related to regulatory financial requirements and address practical implementation issues in the context of the identified concepts of characteristics and components of risk. The standard will discuss the possible approaches to the related issues of segmentation and aggregation, diversification and risk interdependency, and the calibration of the technical provisions and capital requirements in relation to the definition of a common reference framework or market norm. In developing this standard the IAIS will also undertake further work on the definition of a matching or replicating portfolio, and its relationship to the concepts of inherent and voluntary risk.

129. The standards will apply to all types of insurance and reinsurance business, with some differentiation by product where appropriate. It is foreseen that specific more technical items may best be discussed in guidance papers, which may be tailored more precisely to the various types of business. The IAIS recognises that not only the wider context of insurance business and supervision may vary between jurisdictions, but also that the specific product characteristics, claims experience and financial and other data may well differ between

jurisdictions, and to some extent within jurisdictions. Consistency of approach does not imply uniformity at the expense of appropriateness but rather involves an ability to explain differences in terms of the relevant factors.

Governance standards and guidance papers

130. The IAIS has adopted a Governance standard on asset-liability management by insurers³⁹ and proposes a further Governance standard on internal models in the longer term, with a guidance paper to be developed in the first instance.

131. The standard on asset-liability management addresses the importance of and general requirements regarding asset-liability management by insurers, with more detail provided in the associated issues paper.

132. The IAIS philosophy, as also embedded in the Cornerstones and Structure papers, seeks to encourage sound risk management by insurers, including the allowance of the determination of financial requirements by means of internal models. The IAIS will thus draft a guidance paper, initially, to be later developed into a standard, on the validation and preconditions for the use of internal models. Such a discussion on internal models is of course inextricably linked to the setting and assessment of regulatory financial requirements.

133. As indicated earlier, the IAIS sees a need, from a broader perspective, to discuss the crucial role of governance in more general standards and guidance papers on governance. These papers on governance and risk management by insurance companies, which would address the much wider issue of enterprise risk management including the arrangement of governance structures, will be the subject of further work within the IAIS. The Roadmap paper will be reviewed in the first half of 2007, and the work program of the IAIS for development of standards and guidance papers within the broader perspective of the Framework for Insurance Supervision will be elaborated on in that document.

Market conduct standards and guidance papers

134. The IAIS foresees a need for standards and guidance papers on market conduct in relation to the assessment of insurer solvency, to include, for example, issues such as treating customers fairly, reasonable expectations, constructive obligations and misselling. This will give due emphasis to these important aspects of managing the obligations to policyholders which the technical provisions reflect. Operational risk in this area means that cross-reference to the papers on financial requirements will be made. This standard will indicate the need for supervisory review to complement qualitative and financial requirements to ensure that all reasonably foreseeable material risks are covered and the regime is risk-responsive.

135. Again, this standard will be the subject of further work within the IAIS to be elaborated on as part of the revision of the Roadmap paper.

Disclosure standards and guidance papers

136. The Structure paper outlines the critical role of disclosure within an overall approach to insurer solvency assessment. The IAIS will consider the development of more general

³⁹ Refer to the IAIS *Standard on asset-liability management* (2006) and *Issues paper on asset-liability management* (2006).

standards and guidance papers on disclosure, in the context of the review of the Roadmap paper.

Standards and guidance papers on supervisory assessment and intervention

137. In a later stage, the IAIS will decide on the precise form of any further standards and guidance papers on supervisory assessment and intervention.

Appendix: Background to the Structure Paper

138. Since its inception, the IAIS has developed a range of Principles, Standards and Guidance Papers in pursuit of its objectives. These include the IAIS *Insurance core principles and methodology* (2003) (Insurance Core Principles), which address a wide range of issues of relevance to insurance and insurance supervision. These papers have undoubtedly contributed to a convergence of both industry and supervisory principles and practices over the last decade.

139. Insurer solvency and capital adequacy takes a central position in risk management by insurers and in insurance supervision. The IAIS has thus developed a number of papers addressing aspects of insurer solvency, based on the Insurance Core Principles and the *Principles on capital adequacy and solvency* (2002)⁴⁰. The current IAIS standards are confined, however, to general qualitative principles. The IAIS has not yet articulated a globally acceptable and applicable approach to the financial components of insurance supervision, and in particular to the assessment of insurer solvency, which provides sufficient guidance to achieve the IAIS objectives in practice.

140. Consequently, the IAIS has commenced a major project to formulate, in a range of papers, a more precise, consistent, reliable and transparent approach to the assessment of insurer solvency. The project will provide qualitative and quantitative benchmarks that reflect international best practice for the regulatory requirements and the supervisory assessment in a jurisdiction and intervention where necessary to protect policyholders. The present lack of specific benchmarks in relation to technical provisions and capital requirements allows a wide range of approaches which, while complying with general principles, do not achieve sufficient precision and comparability in practice. Critical elements for the assessment of insurer solvency are consistent, reliable, explicit and transparent methods for the valuation of assets and liabilities, and explicit analysis of risks, so that the excess of assets over liabilities⁴¹ can be meaningfully compared to one or more risk-based regulatory minimum financial requirements. The basis of determination of the values of assets and liabilities should be explicit and appropriately reported and disclosed on a consistent basis to achieve transparency and comparability between and within jurisdictions, and to support convergence.

141. As a first step, the IAIS approved, in October 2005, a policy paper entitled: *A new framework for insurance supervision: Towards a common structure and common standards for the assessment of insurer solvency* (Framework paper). This Framework paper describes the rationale for and the contents of a framework for insurance supervision, and serves to clarify and enhance the interrelationship between the envisaged papers on solvency assessment and the other IAIS work by positioning solvency assessment within a wider context of insurance business and supervision.

142. As a next step, the IAIS approved, also in October 2005, the further paper *Towards a common structure and common standards for the assessment of insurer solvency: Cornerstones for the formulation of regulatory financial requirements* (Cornerstones paper). The Cornerstones paper sketches the contours of the common structure and standards, highlighting some of the critical cornerstones for the formulation of regulatory financial requirements. These cornerstones together form the basis for the standards for the assessment of insurer solvency that are to be developed.

⁴⁰ Available on the IAIS website: www.iaisweb.org.

⁴¹ This comparison will also have regard to the available forms of capital in relation to the capital requirements.

143. The IAIS Technical Committee approved in February 2006 the subsequent paper entitled: *Roadmap for a common structure and common standards for the assessment of insurer solvency* (Roadmap paper). The Roadmap paper sets out a more detailed work plan for this project. It firstly sketches the final deliverables of this project: the envisaged form of the common structure, standards and further guidelines for the assessment of insurer solvency, as represented in Figure 4 in section 6 of this paper. Secondly, it identifies the main areas of work to be undertaken in the first two years, based on an analysis of the requirements and of the material already available, and sets the order of priority for this further work. Thirdly, it proposes a process for this work to be undertaken, including a timetable until the end of 2006, with some overflow into 2007⁴². The Roadmap paper foresees a key role for the present paper, *The IAIS common structure for the assessment of insurer solvency* (Structure paper).

144. As indicated in the Roadmap paper, more detailed work on a number of individual standards will mainly take place in a second phase, after the finalisation of this paper, so as to ensure their coherence. The set of papers⁴³ is intended to form the major reference for jurisdictions in developing and updating their own solvency regimes and supervision. The IAIS recognises that many current solvency regimes will not comply fully with the standards set by these papers, but envisages that the solvency regime that applies in a jurisdiction will over time be developed towards conformity with the IAIS papers. The IAIS nevertheless wishes to emphasise that the papers will not prescribe a specific solvency regime to be applied compulsorily by the jurisdictions of the IAIS members. It should be noted in this respect that the concepts presented and terminology used in this Structure paper are intended to be of a general nature and should not be interpreted as legally binding in a specific jurisdiction.

⁴² Note that the timeframes in the Roadmap Paper will be reviewed in early 2007.

⁴³ The set of papers will include the Framework, Cornerstones and Structure Papers and the related standards to be developed.