

INTERNATIONAL ASSOCIATION OF INSURANCE SUPERVISORS



GUIDANCE PAPER ON INVESTMENT RISK MANAGEMENT

OCTOBER 2004

This document was prepared by the Investments Subcommittee in consultation with
members and observers

Guidance paper on investment risk management

Contents

1.	Introduction	3
2.	Investment management by insurers.....	5
3.	Investment risk management framework	7
4.	Market risk.....	12
5.	Credit risk	14
6.	Liquidity risk	18
7.	Supervisory considerations	21
8.	Information the supervisor may request from the insurer	23
	Appendix 1 – References	27
	Appendix 2 – New IAIS Glossary of Terms definitions used in this paper	28

1. Introduction

1. The main focus of prudential regulation and supervision of insurers is usually considered to be the protection of the rights of policyholders. This includes oversight of the continuing ability of insurers to meet their contractual and other financial obligations to their policyholders. The nature of insurance business implies the establishment of technical provisions, and the investment in and holding of assets to cover these technical provisions and a solvency margin. The interplay between the characteristics of the insurance liabilities and the assets backing those liabilities is one of the most important sources of risks to insurers and hence one of the most important aspects of its operations for an insurer to manage. Investment management should therefore be undertaken as part of the overall asset liability management of the insurer. IAIS recognises that asset liability management is a topic for a separate paper. However, insurers also need to specifically control the risks associated with their investment activities, which is the focus of this paper.

2. This paper provides guidance on effective investment risk management for insurers and reinsurers and highlights issues applicable to the management of market risk, credit risk, and liquidity risk. The paper also provides guidance for the supervisor when evaluating investment risk management policies and practices of insurers, including the main set of data and documents the supervisor should consider when assessing and monitoring the investment risk management of insurers.

3. This guidance paper mainly addresses the insurer's investment risk management procedures, referred to in some jurisdictions as the "prudent person" approach. Elements of this approach can also be useful for other jurisdictions which are more prescriptive in nature. Insurers and supervisors should use judgment in assessing to what extent the guidance in this paper is relevant to their jurisdiction and does not create an unnecessary regulatory burden.

4. For the purposes of this paper, 'insurer' describes any corporate body or individual that is operating as an insurer or reinsurer, which is subject to insurance regulation, whether they be a domestic or a global insurer. Financial conglomerates may be considered within the scope of this document as far as they involve insurance activities.

5. Risk management is the process whereby the insurer's management takes action to assess and control the impact of past and potential future events that could be detrimental to the insurer. These events can impact both the asset and liability sides of the insurer's balance sheet, and the insurer's cash flow. Investment risk management addresses investment related events that would cause the insurer's investment performance to weaken or otherwise adversely affect its financial position. Various investment risks tend to focus on different parts of the investment portfolio. Market risk impacts capital investments, including stocks and real estate, as well as the bond and mortgage portfolios. Credit risk is present in the insurer's lending activities, typically in the bond and mortgage portfolios. Liquidity risk is concerned with current and future maintenance of appropriate levels of cash and liquid assets, particularly in the context of the demands for liquidity that are imposed by the insurer's liability profile. A variety of other risks, including operational and legal risk, also arise from investment activities.

6. Jurisdictions may approach investment risk management issues by imposing regulatory constraints on the investment policies and procedures of insurers, by placing restrictions on the categories of assets which may be used to cover technical provisions and the extent to which they may be used for that purpose, and/or by setting specific requirements on the matching of assets and liabilities. Accordingly, appropriate investment risk management policies, as detailed in this guidance paper, are in addition to these regulatory requirements.

7. As a result of regulatory change and globalisation of financial services, together with the growing sophistication of financial markets, the activities of insurers (and thus their risk profiles) are becoming more diverse and complex. In jurisdictions allowing their use, the inclusion of derivatives, or structured products that have the effect of derivatives, as part of the portfolio management processes, has become common practice. In order to be able to manage these diverse and complex risks, the insurers should organise themselves and act according to best practices applied to the business they conduct. The quality and quantity of their resources should be appropriate to the nature and complexity of their business.

8. This paper should be considered in conjunction with other principles, standards or guidance papers developed by the IAIS, in particular the *Principles on capital adequacy and solvency*, the *Solvency control levels guidance paper* and the *Stress testing by insurers guidance paper*. Given the particular importance of the liability structure in determining the investment policies, and the key role of asset liability management for insurers, this paper should be considered together with any IAIS work thereon.

9. The paper contains guidance supporting a number of the IAIS insurance principles. It addresses in part the principle 10, on “*Risk management*” of the January 2002 *Principles on capital adequacy and solvency* that sets out principles that generally underlie solvency regimes for insurers. Furthermore, investment risk management is relevant to many of the *Insurance Core Principles* adopted in October 2003, including:

- *Principle 1: Conditions for effective insurance supervision*
- *Principle 2: Supervisory objectives*
- *Principle 9: Corporate governance*
- *Principle 10: Internal control*
- *Principle 11: Market analysis*
- *Principle 18: Risk assessment and management*
- *Principle 21: Investments*
- *Principle 22: Derivatives and similar commitments*

10. The responsibility for investment risk management lies with the insurer. The insurer should demonstrate to the supervisor compliance with the relevant guidance outlined in this paper. The application of this guidance by the supervisor should be sensitive to the risk profile of the insurer and should take into account the size, nature and complexity of the business of the insurer. The scope of the application and review should be tailored to the supervisor's own regulatory framework.

2. Investment management by insurers

11. The characteristics of liabilities are the driving force in developing investment policies for an insurer. The nature of the insurance business conducted and the nature, terms and conditions of the policies written require the establishment of technical provisions, and the investment in assets which are appropriate to the insurer's liabilities. The design and underwriting of products, and thus the resulting liabilities of an insurer, cannot be considered in isolation from its investment activities. In order to ensure that it can meet its contractual liabilities to policyholders, an insurer should manage its assets in a sound and prudent manner, taking account of the profile of its liabilities, its solvency position and its complete risk-return profile.¹ This forms the essence of the insurer's asset liability management policies.

12. The complete risk-return profile is of particular importance in insurance businesses in so far as insurers are, by nature, risk transformers and their primary function remains risk mitigation. The associated risk level should be compatible with the effective protection of policyholders. It should result from an integrated view of the insurer's business, organisational structure and strategy, taking into account its:

- product and underwriting policies
- reinsurance policies
- asset liability management policies
- solvency level policies

¹ See the definition of “complete risk-return profile” in the IAIS Glossary of Terms

- investment management policies.

13. Insurers should manage their business taking into account all risks. The focus of this guidance paper is investment risk management, including market, credit and liquidity risk. The relative importance of market, credit and liquidity risk will vary depending on, for example, business line, investment strategy and regulatory framework.

14. Consideration should also be given to operational risks within investment activities. For insurers, operational risks can be described as risks of direct or indirect loss resulting from inadequate or failed internal processes, people or systems. They would include, for example, risk arising from failures in corporate governance, systems, outsourcing arrangements and business continuity planning.

15. Given the insurer's profile of liabilities, the investment policies should ensure that the insurer holds sufficient assets of appropriate nature, term and liquidity to enable it to meet the liabilities as they become due. Thus, investment management should be performed as part of the overall asset liability management of the insurer. Key influences on investment decisions include the legal, regulatory, accounting and taxation environment, the various types of insurance business conducted, marketing literature and the availability of assets.

16. The timing and amount of insurance benefit payments is usually uncertain and in some cases sensitive to changes in financial markets (i.e. policyholder behaviour can be related to expectations in financial markets, relative investment performance and quality of customer service). Furthermore, the business of insurance usually involves a mismatch, in timing or amount, between receipt of premium income and payment of expenses and policy benefits. It is important for an insurer to monitor and assess the volatility of its income together with the volatility of its outflows, with respect to size and frequency of both expected and exceptional situations.

17. Detailed analysis and management of this asset and liability relationship will therefore be a pre-requisite to the development and review of investment policies and procedures, which should seek to ensure that the insurer adequately manages the investment related risks to its solvency. At a minimum, investment policies would be expected to address each of the following areas:

- asset and liability considerations, including asset liability management policies
- financial market environment
- eligible asset classes
- amount of delegated limits by management level
- strategic asset allocation
- conditions under which the insurer can pledge or lend assets
- maximum allowed deviation from strategic asset allocation (for example, tracking error)
- capital considerations
- solvency and liquidity considerations
- concentration risk
- risk parameters, including the investment risk management policies or reference to them.

18. Investment policies and procedures should be reviewed regularly and kept up-to-date. Such reviews should be formally documented and approved by the insurer's senior management and its board of directors.

19. Ultimate responsibility for the determination, implementation and monitoring of compliance with the overall investment strategy and policies and procedures and the compliance with legal requirements remains with the insurer's board of directors. However, elements of the implementation of investment management and investment risk management policies may be outsourced (for example, to external investment managers or brokers). Therefore, management of the risks associated with outsourced arrangements also needs to be considered. The insurer should establish outsourcing policies and require compliance with the investment policies defined and with the specific control guidelines regarding the outsourced functions.

3. Investment risk management framework

20. The insurer should have an effective investment risk management framework. In jurisdictions regulating investments and investment procedures of insurers, the investment risk management framework should adhere to any regulatory requirements in relation to investment policies, asset mix, valuation, diversification, asset and liability matching, and risk management. The framework should include: setting market, credit, liquidity and other investment risk management strategies and policies; developing management procedures to ensure that investments are only transacted in line with these policies, and; having an appropriate system of measurement, monitoring, reporting and control underpinning the investment activities.

21. At a minimum, the investment risk management framework should include:

- a description and criteria for measuring each of the investment risks to be monitored
- market risk
 - credit risk
 - liquidity risk
 - operational risk
- compliance policies
- reputation risk management policies
- control procedures, including risk tolerances
- reporting format and frequency.

22. The exact approach to the insurer's investment risk management will depend on a wide range of factors, including the size, level of sophistication and complexity of the insurer's activities. Regardless of the approach, basic principles such as the board of directors' and senior management's responsibility, the need for an investment policy, segregation of duties and appropriate controls should be applicable to all insurers.

23. The quality of the assets and related risks should be clearly communicated and understood throughout the organisation. Special management procedures, monitoring and controls have to be established on riskiest activities, such as complex operations, structured assets with embedded options and blind investments.²

² See the definition of "blind investments (or pools)" in the IAIS Glossary of Terms

Role of the board of directors

24. The board of directors is ultimately responsible for ensuring that sound and comprehensive investment and risk management policies, which adhere to applicable regulation, are developed and for ensuring compliance with these policies. In most cases, the board will delegate the development of these policies to management for its approval, recognising that the policies remain its responsibility. The board should require that processes are in place to enable management to report and demonstrate compliance with these policies on a regular basis. Reporting should include instances of non-compliance and actions taken or planned to bring the insurer back in line with policies.

25. The board of directors is responsible for the determination and periodic review of the overall risk tolerance of the insurer and overseeing senior management in the formulation of the overall investment strategy. The board should take into consideration the insurer's assets and liabilities, regulatory requirements, and the insurer's solvency position. Based on the overall investment strategy, senior management sets the operational policies and procedures and assigns responsibilities. The board should ensure that adequate controls, including management reporting and internal audit, are in place to monitor that investments are being managed in accordance with the investment policies and regulatory and other legal requirements.

26. The board of directors should include members possessing knowledge and understanding of the insurer's markets, products, and risk management and of the markets and products in which the insurer invests. Any committees involved in investment risk management, such as an asset liability committee, should comprise of members possessing such knowledge and understanding.

27. The board of directors should:

- establish, maintain, and regularly review the process for identifying investment risk on existing and new products on both sides of the balance sheet
- set out the process for recommending, approving and implementing decisions
- identify potential sources of conflict of interest and establish procedures to ensure that those involved with the implementation of the investment and lending policies understand where these situations could arise and how they should be addressed
- assign responsibility for investment risk identification and assessment to a person or persons who are independent of the investment function.

Investment risk management function

28. In order to manage investment risk effectively the insurer should clearly identify measure, monitor and control the risks inherent in the investment portfolio. The methods and tools used to measure those risks should be appropriate for the nature and complexity of the risks assumed in the portfolio. Where the methodology is based on external sources (for example, rating agencies), it should make an assessment of the appropriateness of using and continuing to use those sources.

29. Investments risk exposures should be clearly defined and measured, using appropriate risk measurement methods on an ongoing basis. These methods should also be used for establishing

and monitoring risk limits and tolerances. Further, an insurer needs to be able to measure and document the overall amount of risk in its business, which includes the risk in its investment portfolio.

30. In constructing the risk management framework, the insurer should take into account possible material changes in correlations between different products, and between different business lines, on both sides of the balance sheet under stress scenarios. For example, increasing liabilities arising from real estate insurance written may correlate with increased market or credit risk on real estate related assets such as mortgage backed securities.

31. Where an insurer is a member of a conglomerate or group, the group should be able to monitor investments risk exposures on an aggregated basis. An insurer should also be able to demonstrate that it meets the risk management standards on a legal entity and business line basis where applicable. This is particularly important for subsidiaries of groups subject to matrix management where the business lines cut across legal entity boundaries.

32. Insurers should have information systems and analytical techniques that enable management to measure the risk inherent in all investment activities, on and off-balance sheet. The level of sophistication for analysis should be commensurate with the potential materiality of exposures.

33. The insurer should understand the source, type and amount of risk that it is accepting across all lines of business. For example, where there is a complex chain of transactions it should understand who has the ultimate legal risk or basis risk. Similar questions arise where the investment is via external funds, or blind pools. The insurer should have robust reporting lines and staff of sufficient quality and experience to make the risk assessments. It should also have an appropriate methodology to measure its risk.

34. The investment risk management function should assess the appropriateness of the asset allocation limits in the insurer's investment strategy periodically. To do this, regular stress testing should be undertaken for market scenarios, and changing investment and operating conditions appropriate to the insurer's own risk profile.³ Once an insurer has identified the most risky scenarios, it should ensure that its investment policies and procedures are sufficiently defined to ensure the effective management of those high-risk situations.

35. Insurers should have contingency plans on hand that describe the action to be taken under a variety of extreme scenarios. These plans should be reviewed and updated regularly and management should be fully briefed on the plans.

Internal audit

36. In order to adhere to good corporate governance practice, an insurer should have a process (for example, an audit committee of the board) that approves the audit program. Internal audit should provide independent assurance to the board, its audit committee or an appropriate senior manager of the integrity and effectiveness of the insurer's systems and controls for investment risk management, and should make recommendations, where appropriate.

³ The use of scenario testing as a measurement tool is contained in the IAIS *Stress testing by insurers guidance paper*.

37. Internal audits should be conducted to review the insurer's compliance with overall risk management policies (including asset liability management) and procedures. An insurer should establish a system of independent, ongoing assessment of its investment risk management processes and the results should be communicated directly to the board of directors, its audit committee, and/or senior management according to their materiality.

38. Internal auditors should have the requisite level of training and expertise in investment risk management in order to be effective.

Compliance

39. The board of directors and senior management should ensure that a named individual is responsible for all compliance matters and that individual should be independent of the risk-taking units. The insurer should have a process for the dissemination of compliance information, ensuring that it has up-to-date staff training, and that regular compliance reports are produced. Further, it should ensure that there is a procedure to ensure the monitoring of compliance with the overall investment strategy, policies and procedures, legal and regulatory compliance requirements, and the notification of compliance breaches and senior management response and follow up. Senior management and the board of directors should receive regular, timely reports on compliance.

40. A proposed investment decision should have adequate documentation demonstrating that the decision is in compliance with the investment policies and the investment risk management framework.

Control procedures

41. The insurer should have sufficient internal controls, operating limits and other practices to ensure that investments risk exposures are maintained within levels consistent with prudential standards and risk tolerance, as defined by internal limits. An insurer should also have procedures for taking appropriate action according to the information within its management reports.

42. These procedures should address exposures arising from both on-balance sheet and off-balance sheet items.

43. Investment decisions and their execution are subject to the approval authorities described in the insurer's investment policies. There should be governance procedures surrounding both the investment strategy decision making (such as choice of markets and sectors) and investment transaction decision making (such as stock selection). The rationale and approval process for such decisions should be documented and maintained by the investment risk management function. Where material, the documentation should include:

- the rationale and recommendation for the investment decision (this may include documentation of other possible alternatives and the reason(s) why the recommended strategy was chosen)
- the level of risk that will result from execution of the investment decision

- presentation to the appropriate approval authorities
- evidence that the appropriate authority was obtained
- evidence that the decision was executed as authorised (no variation in the terms of the decision) within a specified time frame.

44. The measurement criteria defined for each of the investment risks being monitored should be compared with its risk tolerance on an ongoing basis. Proposed changes in the strategic or tactical allocation should be given a time horizon in which the changes should be executed.

45. When entering into or varying an outsourcing arrangement for aspects of investment related activities, an insurer should consider how the proposed outsourcing will:

- affect its risk level
- comply with regulations, where applicable
- how it will assess the service providers' financial viability
- how it will assess the concentration and liquidity risk implications.

The insurer should also ensure smooth transition when entering, ending or varying the arrangement.

Reporting

46. Procedures and formats for reporting to senior management, the board of directors, auditors and regulators should exist within the investment risk management policies. Reports may differ in design and level of detail included for each of these users. Procedures should include defining where the responsibility for production of each of the reports resides, the layout of each of the reports, and the timing of production and delivery. Reports should include a presentation of the results of the measurements used to assess each of the investment risks broken down by asset class, compared with the constraint outlined in the investment risk management policies. Reports should describe the method for classifying assets and the basis for valuing assets that are not regularly traded.

47. There should also be a presentation of special situations that may fall outside of the normal operations addressed by the policies (for example, special liquidity requirements as they may arise during acquisition or sale of a business unit). Where guidance on a future course of action is needed, reports should list possible alternatives with discussion of their merits and risks, and, if possible, a recommended course of action for management or board approval.

48. An insurer's internal controls should ensure that exceptions to policies, procedures and limits are reported in writing in a timely manner to the board of directors and to the appropriate level of management for action. The reporting on implementation of the investment risk management policies should address compliance with the key elements of the policies such as:

- target markets and approved products
- portfolio concentration limits
- approval authority limits
- investment limits
- rating systems

- the granting, acceptance and quality of the collateral
- minimum required transparency, where applicable (for example, blind pools or hedge funds).

49. The insurer should have compliance procedures to monitor that reviews have taken place, appropriate scenario/stress testing of the investment portfolio performed, decisions taken by the appropriate level of staff, and financial information is regularly and accurately updated.

50. Particular attention should be given to compliance procedures to monitor that the investment risk that does not conform to the usual investment risk policies or that exceeds predetermined risk limits and criteria, but is approved because of particular circumstances, and is in accordance with the insurer's procedures. In those cases, there should be monitoring of the associated conditions and of the remedial plan.

51. Unauthorised exceptions to policies, procedures and limits should be reported in a timely manner, as appropriate to the nature of the breach, to the appropriate level of management together with the remedial action proposed and/or taken.

4. Market risk

52. Market risk is introduced into an insurer's operations through variations in financial markets that cause changes in asset values, products or portfolio valuations.

Definitions

53. Market risk is the risk to an insurer's financial condition arising from adverse movements in the level or volatility of market prices. Market risk involves the exposure to movements of financial variables such as equity prices, interest rates or exchange rates. It includes the exposure of derivatives to movements in the price of the underlying instrument or risk factor. Market risk also involves the exposure to other unanticipated movements in financial variables or to movements in the actual or implied volatility of asset prices and options. Market risk incorporates general market risk (on all investments) and specific market risk (on each investment).

Identification

54. Market risk includes:

- interest rate risk: risk of losses resulting from movements in interest rates; to the extent that future cash flows from assets and liabilities are not well matched, movements in interest rates can have an adverse economic impact
- equity and real estate risks: risk of losses resulting from movements of market values of equities and other assets; to the extent the insurer makes capital investments, including stocks and real estate, the insurer is exposed to sustained declines in market values
- currency risk: risk of losses resulting from movements in exchange rates; to the extent that cash flows, assets and liabilities are denominated in different currencies, currency movements can have an adverse impact on the insurer.

55. Some insurers have sold investment products that guarantee return of policyholder capital, and may include a guaranteed minimum return or offer other forms of embedded options. This risk is generally not diversifiable but increases directly with the amount of such business that is sold. Insurance policies which contain guaranteed values, supported by investments, whose values rise and fall with market conditions, may experience the adverse effects of this type of market risk.

Measurement and management

56. An insurer should be able to measure its market risk exposure across risk factors (i.e. interest rate, equity and currency) and across the entire portfolio. The insurer should set appropriate metrics to measure exposure to market risk factors.

57. An insurer with a complex portfolio is expected to demonstrate more sophistication in its modelling and risk management than an insurer with a simple portfolio. Some trade-off is permissible between the sophistication and accuracy of the model and the conservatism of underlying assumptions or simplifications.

58. Various methods can be used to hedge market risk. An insurer should document the appropriate products to be used to hedge exposures, the items that can qualify to be hedged, how hedging instruments' effectiveness will be assessed and identify individuals responsible for monitoring hedge performance.

59. An insurer should set an appropriate limit structure to control its market risk exposure. The degree of granularity⁴ within the limit structure, or how hierarchical it is, will depend on the nature of the products involved (for example, whether the risks are linear or non-linear), the scale of the insurer's overall business, and whether the insurer has an active or passive investment style. An insurer should set limits on risks such as interest rate risk and equity risk as well as more complex, non-linear factors arising from optionality.

60. The insurer should determine whether the market risk measures for different products should be added, compounded, have offsetting characteristics, or be combined in a more complex way.

61. Market risk limits should be periodically reviewed in order to verify their suitability for current market conditions and the insurer's overall risk tolerance. An insurer should use a model or some form of analytical tool to assess risk in complex instruments or across portfolios. The insurer should evaluate the risks arising from such business independently from those who trade market risk.

62. An insurer should also use stress testing to determine, amongst others, the potential effects of economic shifts, market events, changes in interest rates, changes in foreign exchange and changes in liquidity conditions. Particular attention should be given to the relevance and to the reliability of the underlying assumptions.

⁴ In this context, granularity refers to the level of detail in policies used to set exposure limits. At a high level, limits may be set with respect to asset class exposure. At a more detailed level, limits regarding specific industries, geographic areas, or even specific issuers may be considered.

63. Sufficient records should be retained to enable the insurer to perform back testing of methods and assumptions used for stress and scenario testing and for back testing of market risk models such as Value at Risk (VaR).

5. Credit risk

64. For most insurers, extending credit through investment and lending activities comprises an important portion of their business. Therefore, the quality of an insurer's credit portfolio affects the risks borne by policyholders and shareholders. Credit risks arising from reinsurers, brokers, agents and clients are not included as "Investment Risks". These categories of credit risk should be dealt with under the analysis of reinsurance coverage and the underwriting process. These risks must be managed but are not the focus of this paper, which deals only with investment risk management.

Definitions

65. Credit risk is the risk of financial loss resulting from default or movement in the credit quality of issuers of securities (in the company's investment portfolio), debtors (for example, mortgagors), or counterparties (for example, on reinsurance contracts, derivative contracts or deposits given) and intermediaries, to whom the company has an exposure. Credit risk includes:

- default risk: risk that an insurer will not receive, or receives delayed, or partially, the cash flows or assets to which it is entitled because a party with which the insurer has a bilateral contract defaults on one or more obligations
- downgrade or migration risk: risk that changes in the probability of a future default by an obligor will adversely affect the present value of the contract with the obligor today
- indirect credit or spread risk: risk due to market perception of increased risk on either a macro or micro basis
- concentration risk: risk of increased exposure to losses due to concentration of investments in a geographical area, economic sector, counterparty, or connected parties.

66. The accepting of credit, in the context of an insurer's claims management, hedging, investment and lending activities, is the provision of funds on agreed terms and conditions to a counterparty (or borrower) who is obliged to repay the amounts owing (often but not always, together with any interest thereon). Credit may be extended, on a secured or unsecured basis, by way of instruments such as reinsurance ceded, premiums for hedging vehicles, mortgages, bonds, asset-backed securities, private placements, leases, and stock lending (from both a quantitative and qualitative perspective), derivatives, and structured products that have the effect of derivatives. Some of these instruments may lead to potential future exposures.

Identification

67. The general areas of credit risk in which an insurer is prepared to engage should be identified in its investment policies. The type of credit activity, type of collateral security or real estate, and types of borrowers on which an insurer may focus should be specified. Special attention should be paid to embedded transactions of credit risk (such as credit derivatives). Furthermore, credit risk of investment activities should be coordinated with credit risk of other

activities of the insurer (i.e. an insurer is exposed to additional counterparty credit risk when dealing with reinsurers and brokers, among others – see the Appendix – Reference 9).

68. Transactions and exposures involving entities that are connected or affiliated to each other require special attention. These transactions and exposures could give rise to non-market terms and conditions, concentration risk or liquidity risks or a combination of them. Therefore, the insurer should have policies on connected exposures, as well as policies on intra-group exposures that ensure:

- connected exposures are viewed at group level and consider potential exposures to all assets and liabilities, as well as reinsurance
- where an insurer is a member of a conglomerate or group, the insurer has policies on its transactions
- with and its exposures to the group.

69. Procedures should be in place for assessing the credit worthiness of counterparties to whom the insurer is exposed and for setting internal limits on such exposures, where appropriate.

70. Procedures should exist which define prudent criteria for identifying and reporting potential problem credit exposures to ensure that they are regularly reviewed, and that provisions are made where necessary. Once these credits have been identified, insurers should prepare a “Watch List” that is monitored by senior management and presented to the board of directors regularly. Insurers should have a disciplined remedial management process, triggered by specific events, which is administered through appropriate credit administration and problem recognition systems.

71. Another instance of credit risk relates to the process of settling financial transactions. If one side of a transaction is settled but the other fails, a loss may be incurred that is equal to the principal amount of the transaction. Even if one party is simply late in settling, the other party may incur a loss relating to a missed investment opportunity. Settlement risk (i.e., the risk that the completion or settlement of a financial transaction will fail to take place as expected) includes elements of market, credit, liquidity, operational risks. The level of risk is determined by the particular arrangements for settlement. Factors in such arrangements that have a bearing on credit risk include the timing of the exchange of value, payment and settlement finality, and the role of intermediaries.

72. Insurers engaged in the use of instruments, such as derivatives, should also take into consideration that counterparty exposures could change depending on the mark-to-market value of the underlying financial instrument. Effective measures of potential future exposure are essential for the establishment of meaningful limits, placing an upper bound on the overall scale of activity with, and exposure to, a given counterparty, based on a comparable measure of exposure across an insurer’s activities both on and off balance sheet.

73. Insurers should have policies for approval, accepting and monitoring of collateral. This should include assessment of the controls supporting funding exposures, the valuation policies of collateral, including the basis, frequency, discounted assessment and reviews made of the security (see Appendix – Reference 11).

Measurement and management

74. Credit exposure limits should be established within the insurer's investment policies. Measuring compliance with these limits will involve developing the ability to aggregate the insurer's investment exposure within each defined risk classification. These could include exposure limits on the following risk classifications:

- type of collateral security or real estate
- single counterparties and connected counterparties (such as through legal, economic or managerial basis)
- industries or economic sectors
- geographic regions.

75. Rules for the aggregation of individual exposures within a common risk classification, such as conglomerate, industry and geography, should be established and well defined in credit policies.

76. Measurement tools to be used to determine the insurer's credit risk exposure could include:

- internal ratings
- external ratings
- results of stress testing
- concentration aggregations (geography, issuer, group of issuers)
- concentrations within the insurer's group of affiliated companies.

77. Credit risk exposure limits defined by the insurer's investment policies should be expressed in a manner consistent with the risk measures that will be used to monitor the insurer's credit risk activities. Hence, limits and monitoring systems should be determined in conjunction with each other. Measured credit risk exposure will be compared with the limits outlined in the investment policies. For example, the policies may impose a credit limit on the insurer's investing activities defined as:

- a maximum amount or percentage of investment exposure to a single issuer, industry, geographic region, or some other risk classification
- a limit on the amount or percentage of investment exposure to certain levels of credit ratings (external or internal or a combination of these)
- more sophisticated measures may be developed, such as a maximum value at risk, according to the insurer's stress testing capabilities.

78. In order to track portfolio diversification characteristics, insurers should have a system that enables credits to be grouped by characteristics such as type of credit activity, ranking by size of counterparty credit exposures, credit ratings, type of collateral security or real estate, type of borrower, type of industry and geographic regions.

79. The credit risk management function should actively participate in the development, selection, implementation and validation of rating models. It should assume oversight and supervision responsibilities for any models used in the rating process, and ultimate responsibility for the ongoing review and alterations to rating models.

80. Insurers should take into consideration potential changes in financial and economic conditions when assessing individual credits and their credit portfolios, and should assess their credit risk exposures under stressful conditions.

81. Although the determination of whether or not a particular concentration (as mentioned in previous paragraphs) is excessive is a matter of judgement, it should satisfy regulatory requirements, be benchmarked against industry norms (if available), and viewed in light of the insurer's capital base and stress test results. In circumstances where an insurer's credit risk has become excessively concentrated, the insurer should take timely steps and have options available to diversify its credit portfolio. This includes assessment on both sides of the balance sheet.

82. The insurer should measure and monitor its risk at both the transaction and portfolio levels to the appropriate time horizon. Insurers should regularly monitor the status of counterparties and underlying security and re-evaluate individual credits, commitments, and their credit ratings. Failure to do so can result in an undetected deterioration of the credit portfolio. Depending on the type of credit and the underlying security, the credit risk management program of each insurer should include procedures governing the regular formal review and, where applicable, the re-rating of credits.

Rating system

83. The term "rating system" comprises all of the methods, processes, controls, data collection and information systems that support the assessment of credit risk, the assignment of internal risk ratings, and the quantification of default and loss estimates. Each insurer could articulate in its credit policies the relationship between risk rating grades in terms of the level of risk each grade implies. Perceived and measured risk should increase as credit quality declines from one grade to the next. The policies should articulate the risk of each grade, both in terms of rating criteria associated with the grade, and the approximate range of risk parameters associated with each grade.

84. The structure of an insurer's rating system should be designed in a way that makes certain there is a meaningful distribution of exposures across grades, and a sufficient number of grades to support a meaningful differentiation for lesser grades, including one for borrowers that have defaulted. Insurers with lending activities focused on a particular market segment, such as originating mortgages, will require fewer grades than insurers that lend to borrowers of diverse credit quality.

85. A "rating grade" is defined as an assessment of credit risk on the basis of a specified and distinct set of rating criteria. The grade definition should include both a description of the degree of credit risk typical for credits assigned the grade and the criteria used to distinguish that level of credit risk. Insurers with non-marketable investments, such as loans and private placements, concentrated in a particular market segment and range of credit risk should have enough grades within that range to support meaningful differentiation of risk in respect of the investments held.

86. When assigning ratings insurers should:

- take all relevant information into account
- ensure that such information is current
- verify the integrity of all data used
- be more conservative in circumstances where there is less information available
- ensure that ratings are consistent across the portfolio
- be careful to differentiate between ratings assignment, which is issuer specific, and credit limit setting, which is portfolio based.

87. An external rating may be a primary factor determining an internal rating assignment; however, the insurer should make certain that it considers other relevant information. If an external rating is used, the insurer should address how much reliance it gives to external ratings and how it proposes to keep track of external rating changes.

6. Liquidity risk

88. Liquidity is concerned with the current and future maintenance of appropriate levels of cash and liquid assets, in the context of the demands for liquidity that are imposed by the insurer's asset and liability profile. Under normal business conditions, liquidity risk is limited by the cash flow structure of the insurance business. The business of insurance usually involves the existence of a substantial time lag between the receipt of premium income and payment of expenses and policy benefits. Liquidity stress conditions may materialise primarily due to an unanticipated sequence of policyholders' claims but may sometimes be increased through specific market conditions.

Definitions

89. Liquidity risk is the risk that an insurer, though solvent, has insufficient liquid assets to meet its obligations (such as claims payments and policy redemptions) when they fall due. The liquidity profile of an insurer is a function of both its assets and liabilities.

90. Liquidity risk includes:

- liquidation value risk: the risk that unexpected timing or amounts of needed cash may require the liquidation of assets when market conditions could result in loss of realised value
- affiliated investment risk: the risk that an investment in a member company of the conglomerate or group may be difficult to sell, or that affiliates may create a drain on the financial or operating resources from the insurer
- capital funding risk: the risk that the insurer will not be able to obtain sufficient outside funding, as its assets are illiquid, at the time it needs it (for example, to meet an unanticipated large claim).

Identification

91. The most striking example of loss due to liquidity risk is a “large claim and/or surrender” event (i.e. catastrophes, such as large windstorms or earthquakes). This event may require insurers to pay a large amount of claims within a short period of time. This situation can cause a substantial drain on liquidity, reduce solvency, and may lead the insurer to fail. Some reinsurance contracts include a provision whereby the insurer may be able to receive early claims payments. Such “cash claims” from its reinsurer could be considered as a form of liquidity hedge within the context of liquidity management.

92. There are different levels of liquidity management, including:

- day-to-day cash management
- testing and scenario analysis, including an analysis of catastrophe risk.

93. A single or a few contract holders that control large sums of money (policies or contracts) can expose the insurer to a high degree of liquidity risk. Institutional type products are the biggest risk in this respect, although in retail lines, a small group of agents and/or brokers may control large blocks of business, and that poses a similar risk.

94. The size or credit rating of the insurer, and/ or local regulation, may limit its access to capital markets. If an insurer is too small, it may not have all of the funding choices that are available to larger insurers. Also, when several insurers are faced with a large unpredictable liquidity requirement at the same time and need to liquidate some of their asset portfolio, the marketplace may not be able to absorb the volume other than at unfavourable prices.

95. To the extent that they are predictable, immediate demands on cash should not pose undue liquidity risk for an insurer. Any immediate demand for a cash payment can be a risk if cash is in short supply. A well-managed insurer will structure its assets in such a way so that it has enough cash and marketable securities to cover its known obligations.

96. An unpredictable cash demand is a larger risk. For example, a surrenderable non-life insurance contract may have a 90-day delay provision, which under normal circumstances gives the insurer a reasonable amount of time to access its liquidity sources. The shorter the deferral period, the larger the risk.

97. In jurisdictions that allow borrowing, insufficient ability to borrow short term such as through bank lines of credit or commercial paper increase liquidity risk. For example, following an insurance risk event banks may be unwilling to lend to an insurer. Where possible, formal credit lines should be established to mitigate that risk.

98. Lack of diversity in either the liability or the asset portfolio when analysed by product, geography, industry or creditor can lead to increased liquidity risk. An over-concentration of illiquid assets, such as real estate or thinly traded securities, may be especially risky. Resources should be well diversified, and not over-rely on a single source. This is particularly important for mutual insurers who generally have access to a smaller range of funding sources.

99. Policy redemption options that are sensitive to changes in asset values will increase liquidity risk.

100. Liquidity problems also arise when there is a mismatch between the term of the liabilities and their underlying assets. In these situations, trigger events, such as the insurer receiving a downgrade from a rating agency, can lead to a liquidity crisis. If this is coupled with other factors, such as large policies with flexible surrender terms with short time horizons, the liquidity risk is compounded.

101. Other examples of unexpected strains on liquidity are:

- negative publicity
- reports of problems of other insurers or similar lines of business
- deterioration of the economy
- abnormally volatile or stressed markets.

Measurement and management

102. In order to determine an insurer's exposure to liquidity risk, a set of measurement tools should be selected and then applied to its portfolio. There are no simple formulas that work for all insurers. However, the basic tools that the industry uses can be classified into two groups: cash flow modelling and liquidity ratios. These are tools used to monitor an insurer's liquidity risk profile and should be kept current (modified as the business changes), run periodically and may be used for a business unit or an entire insurer.

103. Cash flow modelling is done to assess the magnitude of deficits, surpluses and the ability of contingent funding to meet the needs of the insurer. It lends itself to a stress testing approach, allowing the insurer to examine its potential liquidity needs under a variety of future scenarios. In this way, the insurer can assess the probability of requiring immediate access to liquidity at a time when this may prove costly (due to forced liquidation of assets at low market values, or high borrowing costs). The insurer can take steps to ensure that it will have sufficient cash and short-term liquid assets on hand to meet unexpected, but not highly unlikely, liquidity requirements.

104. Use of liquidity ratios addresses the need for liquidity by establishing a normal expected amount of liquidity that would be required to meet the demands of the underlying liability portfolio. Taking this as the minimum level of required liquidity and adding an appropriate margin to cover unexpected liquidity requirements will define the required liquidity ratio to be used in the insurer's investment policies.

105. As indicated above, insurers may be able to obtain emergency liquidity funding in the event of a catastrophe by drawing cash early under their reinsurance policies or by other means. This form of liquidity hedging could be recognised when assessing the amount of liquidity available to meet the required level defined by the insurer's investment policies.

106. The insurer should have a liquidity contingency plan to be implemented in the event that its usual liquidity management is unable to meet demands.

7. Supervisory considerations

107. The responsibility for the investment risk management lies with the insurer. The insurer should demonstrate to the supervisor compliance with the guidance outlined in this paper. The application of this guidance should take account of the size, nature and complexity of the business of the insurer. The scope of the application and review should be sensitive to the risk profile of the insurer, together with the supervisor's own regulatory framework.

108. In assessing an insurer's investment risk management function, a supervisor should review the insurer's investment risk management framework, investment policies, and the execution thereof. The supervisor should satisfy itself that an insurer understands the risks it is bearing and has effective procedures for identifying, monitoring and managing its investment activities to ensure that its assets are consistent with its liability profile.

109. Supervisors have to keep in mind the increasing complexity of financial activities and continuous innovations, both in assets or products and in methods or systems. Therefore, supervisors have to be organised in such a way to ensure that supervisory activities are carried out by personnel with a high level of knowledge in financial markets and products. One key step to achieve this goal is to maintain continuous training.

110. The insurer's investment risk management framework should include at a minimum:

- the identification of risks
- the measurement of risks
- control procedures
- reporting procedures.

111. In reviewing the insurer's investment policies, the supervisor should consider whether these:

- are in compliance with regulatory requirements, and contain clearly defined procedures to ensure that regulatory requirements are adhered to
- are protecting the policyholders' rights
- consider operational risks that could arise from investment activities
- are clearly defined with appropriate emphasis on risk management and demonstration of asset liability management
- address the extent of use and management of third parties
- address the use of derivative products or structured products that have the effect of derivatives, in asset classes and insurance products, where applicable
- define the risk-return profile adequately given the product(s) used.

112. Where the investment policy has a direct impact on the returns available to policyholders, the supervisor should satisfy itself that the insurer has procedures in place to monitor that the investment policy is carried out in accordance with the policy conditions or any information provided to the policyholders.

113. Consideration should also be given to whether the insurer's overall investment risk management policies:

- have been developed to appropriately reflect the insurer's risk tolerance given the insurer's financial position
- address how the insurer organises its investment risk management function
- contain clear investment guidelines and procedures to ensure the investment policies are adhered to
- have regard to adequate staff being involved with investment risk issues (at whatever level, such as board level, trading or risk monitoring) who understand the risks involved, are of an appropriate level within the organisation, and have clearly defined responsibilities
- have been approved and are subject to regular review by the board of directors.

114. The supervisor should satisfy itself that the investment risk management functions within the insurer are independent of the investment function.

115. The supervisor should assess whether the insurer is aware of the range of risks that it faces, has procedures in place to identify, monitor and measure these risks and takes steps to manage and mitigate them effectively. The supervisor should conduct regular evaluations of an insurer's policies, procedures and practices related to its investment risks.

116. The supervisor may apply its own tests to the insurer's portfolio to assess whether the measurement of investment risk by the insurer is adequate. Use of benchmarks and tools such as industry norms and stress testing may be useful in this type of exercise.

117. Where the insurer is part of, or heads, a group or conglomerate of companies, the supervisor should assess compliance with the above guidance in a group context.

118. The supervisor may use various means to assess the insurer's investment risk management framework, including:

- required regulatory reporting to capture relevant data (standardised reporting may be considered to enable greater market comparisons)
- external validation and/or use of experts (such as auditors, actuaries, risk managers)
- review of the insurer's systems and controls
- on-site inspections
- off-site surveys and surveillance
- internal audit reports
- review of the insurer's product control
- publicly disclosed reporting
- documentation describing risk management and investment committee framework.

119. The supervisor should satisfy itself that the insurer initiates processes to implement new risk management strategies quickly in response to the emergence of significant new risks or changes in significant risk.

120. The supervisor should satisfy itself that the investment risk management function provides the board of directors, the insurer's management, and any committee(s) involved in investment risk management with timely risk reports in order to take appropriate decisions on risk issues.

121. Deficiencies identified during the supervisory review should be addressed in a timely manner through a range of actions. The supervisor should communicate findings and recommendations to the insurer's management and the board of directors promptly and perform a timely follow up.

8. Information the supervisor may request from the insurer

122. In order to assess the insurer's risk management framework, the supervisor may request, amongst other, the following information:

Documents relating to management of investment risk

- a copy of the insurer's investment risk management policies, including the insurer's tolerance and limits for managing its market, credit and liquidity risks
- a copy of an insurer's asset liability management procedures. For example, the terms of reference of the insurer's asset liability committee, if there is one
- details of the insurer's investment policies, including its identification, monitoring and control procedures, and the terms of reference of the insurer's investment committee, if there is one, including details on the investment guidelines for derivatives or structured products that have the effect of derivatives
- the insurer's procedures for the approval of counterparties, including details on the insurer's procedures for selecting and monitoring external asset managers and brokers used
- details in relation to embedded options
- the insurer's procedures for seeking approval to use new investment instruments and for monitoring the risks associated with these instruments once the insurer commences using them
- a description of the board of directors' overall approach and policies on products, underwriting, reinsurance cover and security, investments and solvency
- details on the employee remuneration structure, to assess whether there are any excessive bonuses or unusual remuneration incentives, which encourage excessive risk taking.

Sample reports

123. Reporting entails costs for insurers and this aspect should be taken into account in setting the reporting requirements. The supervisor may request, amongst others, the following reports:

124. Investment risk management reports:

- reports from the insurer's internal and external audit and risk assessment functions, if applicable, including exception reports, where risk limits and policies have been breached or systems circumvented
- investment risk measurement reports that, at a minimum, cover the following areas:

- details of, and commentary on, investment activities in the period and the relevant period end position
- details of positions by asset type
- concentration analysis of credit exposures by counterparty
- details of any regulatory or internal limits breached in the period and subsequent actions taken, where appropriate
- planned future investment activities.

125. Market risk reports:

- specific details relating to market risks types such as interest rate risk, equity and real estate risk, commodity risk and currency risk
- interest rate risk run by the insurer via a mismatch in the cash flow can be assessed by comparing the expected change in the economic value of assets and the liabilities for changes in interest rates
- the significance of the economic value of derivatives or structured products that have the effect of derivatives like embedded options, with specific attention to asset and/or insurance products that include a guaranteed minimum return
- returns made on the investment portfolio need to be explained. The sources of return can be identified and checked whether the outcome was in line with the mandate. Two types of reporting will provide helpful information:
 - 1) performance contribution: this concerns the decomposition of total returns and determines what factors have contributed to the return made on the investment portfolio
 - 2) performance attribution: this concerns the decomposition of excess returns (positive or negative) relative to an assigned benchmark and determines the factors that have caused the relative performance of the investment portfolio.

These reports are to give insight into the development of returns over a single time period (for example, one month) and over multiple periods (for example, one year).

126. Credit risk reports:

- specific details relating to credit risk such as credit exposures, including aggregations of credit exposures, as appropriate, by groups of connected counterparties, and/or by the nature or geographical location of the counterparty
- details of credit decisions, including the facts or circumstances upon which decisions were made
- information relevant to assessing current credit quality.

127. Liquidity risk reports:

- specific details relating to the prospective cash flows of the insurer for both single periods and multiple periods. Expected premium income, liability payments, expenses, payments resulting from lapses of policies, investment income and repayment of principal by debtors as budgeted for that period should allow assessment of the liquidity profile of the insurer under the assumption of a going concern. Stress testing the various flows could give an insight into the liquidity risk under more difficult conditions than assumed

- specific details relating to the level of liquid assets held by the insurer and the terms and conditions of existing credit lines for insurers in jurisdictions that allow borrowing. A way to assess the liquidity of assets is by determining the average number of days required to liquidate that security based on the daily volume of market transactions in that security.

Regular reporting to the supervisor

128. In order to receive current information on investment risk management, the supervisor may wish to establish reporting mechanisms, directly with insurers, including internal audit, and third party (e.g. auditors and actuaries) reports, depending on the regulatory framework.

129. Consideration should be given to the frequency of the data requests. These should be timely, the frequency being determined by factors such as:

- the volatility of the business in which an insurer is engaged (i.e. the speed at which its risks can change)
- any time constraints on when action needs to be taken
- the level of risk that the insurer is exposed to compared to its available financial resources and investment risk tolerance.

Ad hoc requests

130. The supervisor may also request the following information:

- an overall business plan that includes information in respect of the types of business, indicating new products, strategy for distribution, underwriting, investments, reinsurance, a multi year budget and liquidity forecasts. This information should be used to assess whether risk management systems are adequate for the insurer's business
- cost and investment income allocation methods
- financial projections under expected and abnormal (such as stressed) conditions. In addition, reconciliation of actual profit and loss to previous financial projections and an analysis of any significant variances. Scenario testing could be done (for example the percentage change in interest rates and equity values both on the insurer's assets and liabilities)
- details on the insurer's stress testing for economic trends in investment markets
- internal management information on asset portfolios such as:
 - details of the relative position of assets and liabilities
 - details on intra-group investments
- list of matters that required a decision from the board of directors or senior management (such as a significant variation to a business plan, amendments to risk limits or the creation of a new business line)
- when on-site at an insurer, the supervisor could ask how signatories to the insurer's financial returns satisfy themselves that the regulatory financial returns are complete and accurate
- professional qualifications of those entrusted with investment activities and investment risk management
- audit management letters received by the insurer, and the insurer's responses
- details on the insurer's investment function outsourcing, including third party service agreements (if applicable)

- copies of the insurer's compliance reports in relation to investment risk management policies and procedures.

Appendix 1 – References

IAIS References

1. *Glossary of Terms*, September 2003.
2. *Solvency control levels guidance paper*, October 2003.
3. *Stress testing by insurers guidance paper*, October 2003.
4. *Paper on credit risk transfer between insurance, banking and other financial sectors*, presented to the Financial Stability Forum, March 2003.
5. *Principles on capital adequacy and solvency*, January 2002.
6. *Supervisory standard on asset management by insurance companies*, December 1999:
 - chapter 3 provides details on the role and responsibilities of the board of directors and senior managers, and the investment strategy
 - chapter 4 provides details on the risk management function, internal controls and audit.
7. *Supervisory standard on derivatives*, October 1998.
8. *Supervisory standard on supervision of reinsurers*, October 2003.
9. *Supervisory standard on the evaluation of the reinsurance cover*, January 2002.

Other

10. Bank for International Settlements, *Sound Practices for Managing Liquidity in Banking Organisations*, February 2000.
11. The International Organization of Securities Commissions, *Securities lending transactions: Market Development and Implications*, Joint Report by the Technical Committee and the Committee on Payment and Settlement Systems (CPSS), July 1999.
12. International Actuarial Association, *A Global Framework for Insurer Solvency Assessment*, Research report of the Insurer Solvency Assessment Working Party, 2004.

Appendix 2 – New IAIS Glossary of Terms definitions used in this paper

The new definitions and changes to current definitions that are introduced in this guidance paper are as follows:

- **Affiliated investment risk** – the risk that an investment in a member company of the same conglomerate or group may be difficult to sell, lose its value or create a drain on the financial resources of the insurer.
- **Asset liability management** – refers to the management of an insurer's assets with specific reference to the characteristics of its liabilities so as to optimise the balance between risk and return. The insurer's policy with respect to its asset liability management processes will include measures to be used to assess the degree of risk that the insurer is assuming and constraints or boundaries on the value of these measures. Asset liability management will form part of the overall investment risk management framework and will provide direction for investment activities with reference to the demands of the insurer's liability portfolio.
- **Basis risk** – the risk that yields on instruments of varying credit quality, marketability, liquidity and maturity do not move together, thus exposing the insurer to market value variation that is independent of liability values.
- **Blind investments (or pools)** – portfolio of investments managed by an external investment manager. The pool may consist of investments whose general characteristics are known to the pool participants, but the specific holdings are not always known. It may also consist of a pool of capital not yet invested, but with a mandate to be invested by the manager in certain investment vehicles in which the manager has specialised expertise.
- **Capital funding risk** – the risk that the insurer will not be able to obtain sufficient outside funding at the time it needs it (for example, to meet an unanticipated large claim).
- **Commodity risk** – the risk of exposure to losses resulting from movements of market values of commodities, either physical commodities themselves or derivatives that have commodities as the underlying instruments.
- **Complete risk-return profile** – the establishment of a well defined risk tolerance and desired target return that the insurer may wish to achieve in its overall operations or in some specific aspect (for example, product line) of its operations.
- **Concentration risk** – the risk of increased exposure to losses due to concentration of investments in a geographical area, economic sector or individual investments. Concentration risk may exist at either the legal entity level or the group level (after the holdings of all legal entities have been consolidated) or both [Related definitions: *conglomerate risk*, *contagion*, and *risk concentration*].
- **Correlation risk** – the risk of increased exposure to losses due to the level of, or movement in, the correlation of investments in or across geographical areas, economic sectors or individual investments or with and between liabilities.
- **Counterparty credit risk** – the risk that a counterparty is not able or willing to pay amounts owing to the insurer as they fall due.

- **Credit ratings** – assessments of the abilities of debtors (e.g. bond issuers) to pay amounts owing to investors as they fall due. [Related definitions: *credit rating assignment, rating agency, rating grade, rating model, rating process, rating system*]
- **Credit rating assignment** – the credit rating assigned to a particular issuer of debt instruments, or to a specific debt instrument.
- **Credit risk** – the risk of financial loss resulting from default or movements in the credit rating assignment of issuers of securities (in the company's investment portfolio), debtors (e.g. mortgagors), or counterparties (e.g. on reinsurance contracts, derivative contracts or deposits) and intermediaries, to whom the company has an exposure. Credit risk includes default risk, downgrade or mitigation risk, indirect credit or spread risk, concentration risk and correlation risk. Sources of credit risk include investment counterparties, policyholders (through outstanding premiums), reinsurers, and derivative counterparties. [Related definitions: *reinsurance credit risk*]
- **Default risk** – the risk that an insurer will not receive the cash flows or assets to which it is entitled because a party with which the insurer has a bilateral contract defaults on one or more obligations.
- **Downgrade or migration risk** – the risk that changes in the probability of a future default by an obligor will adversely affect the present value of the contract with the obligor today.
- **Equity and real estate risk** – the risk of exposure to losses resulting from movements of market values of and income from equities and real estate.
- **Granularity** – the level of detail that investment policy includes in setting market exposure limits. At a high level, limits may be set with respect to asset class exposure. At a more detailed level, limits regarding specific industries, geographic areas, or even specific issuers may be considered.
- **Hedge** – to invest in a manner that reduces the risk having regard to the underlying assets or liabilities. A hedging strategy will take into account the risks, return required and the projected cash flow of the assets or liabilities, including the existence of policyholder options which may be exercised. Risks to be considered will include market and credit risk.
- **Indirect credit or spread risk** – the risk due to movements in market perception or appetite for risk on either a macro or micro basis.
- **Interest rate risk** – the risk of exposure to losses resulting from movements in interest rates.
- **Internal controls** – the means by which compliance with the insurer's risk management policies is maintained. Regular reporting, including the use of measurements and metrics required to be within limits specified by the risk management policies, may be used to verify compliance.
- **Investment management** – the activity of making and controlling investment decisions [Related definitions: *investment policy, investment risks, investment risk management, investment risk management policy, investment risk management framework, investment risk management function, investment risk exposures, investments risk limits*].
- **Investment policy** – the insurer's policy with respect to the overall characteristics for an investment portfolio or for the investments of the insurer as a whole. A statement of a

portfolio's investment policy will normally include the objectives of the portfolio, its risk tolerance, constraints to be obeyed in the management of the portfolio, such as minimum liquidity requirements, and a list of eligible assets or asset classes in which the portfolio may be invested, along with a target asset mix and limits on how much the portfolio may diverge from the target.

- **Investment risks** – the various kinds of risk which are directly or indirectly associated with the insurers' investment management. They concern the performance, returns, liquidity and structure of an insurer's investments. Such risks can have a substantial impact on the asset side of the balance sheet and the company's overall liquidity, and potentially can lead to the company being over indebted or insolvent.

The investment risks include:

- market risk
 - credit risk
 - liquidity risk
 - operational risk
-
- **Investment risk management** – the process an insurer uses to identify investment risk exposures, and to monitor, measure, report, and mitigate this risk.
 - **Investment risk management policy** – the insurer's policy with respect to investment risk management including definition of the investment risk exposures that are present in an insurer's operations, a description of the investment risk management process, and assignment of the investment risk management function within the insurer's structure.
 - **Investment risk management framework** – the strategies, policies, procedures, methodology and the organisational structure that an insurer uses to perform its investment risk management function. The investment risk management function is normally separate and distinct from the investment management function, to the extent that this is practical for the insurer.
 - **Investment risk management function** – the committees, departments, or persons charged with the responsibility to ensure that the insurer complies with its investment risk management policy and the activities that they carry out, including the oversight of timely corrective action when investment policy constraints are breached and other mitigating action.
 - **Investment strategy** – the overall direction by the insurer's investment management governing the insurer's investment policy and investment risk management policy.
 - **Investments risk exposures** – measures of the amounts by which an insurer's financial position may vary adversely.
 - **Investments risk limits** – the maximum amount of risk exposure that an insurer is prepared to accept. Limits are normally included in the insurer's risk management policy, and monitoring of compliance with these limits is part of the risk management function.
 - **Market risk** – the risk to an insurer's financial condition arising from movements in the level or volatility of market prices. Market risk involves the exposure to movements of financial variables such as equity prices, interest rates, exchange rates or commodity prices. It also includes the exposure of derivatives to movements in the price of the

underlying instrument or risk factor. Market risk also involves the exposure to other unanticipated movements in financial variables or to movements in the actual or implied volatility of asset prices and options. Market risk incorporates general market risk (on all investments) and specific market risk (on each investment). [Related definition: *matching risk*]

- **Rating agency** – entity that specialises in assigning credit ratings to borrowers.
- **Rating grade** – an assessment of credit risk satisfying a specified and distinct set of rating criteria. The grade definition should include both a description of the degree of credit risk typical for credits assigned the grade and the criteria used to distinguish that level of credit risk.
- **Rating model** – a systematic approach to determining one or more of the risk characteristics of a potential, or an existing, investment in a consistent manner with other investments to facilitate comparison.
- **Rating process** – the steps used to determine an appropriate rating for a potential or existing investment.
- **Rating system** – comprises all of the principles, methods, processes, controls, data collection and information systems that support the insurer's or credit rating agencies assessment of credit risk, the assignment of risk ratings, and the quantification of default and loss estimates.
- **Risk tolerance** – an insurer's risk tolerance is a statement of the nature and amount of risk exposure that the insurer is willing to accept. The risk tolerance will dictate the risk limits that are established as part of the insurer's risk management policy.
- **Settlement risk** – the risk that the completion or settlement of a financial transaction will fail to take place as expected. It includes elements of market, credit, liquidity and operational risks. The level of risk is determined by the particular arrangements for settlement. Factors in such arrangements that have a bearing on credit risk include the timing of the exchange of value, payment and settlement finality, and the role of intermediaries.
- **Value at risk** – A measure of the potential financial loss in the investment portfolio or on the whole balance sheet. Value at risk provides an estimate of the worst expected loss over a certain period of time at a given confidence level. For example, a 12 month value at risk with a 95% confidence level of \$1 million means that an insurer would only expect to lose more than \$1 million 5% of the time or once in 20 years.
- **Value at risk (VaR) models** – systems which use statistical approaches to determine the value at risk of all or part of an insurer's operations.