30 GROUP OF THIRTY

REINSURANCE *and* International Financial Markets

All members of the Steering Committee served in their personal capacities. The views expressed in this report do not necessarily reflect the views or policies of their respective institutions, nor does publication of the report by the Group of Thirty imply an endorsement of the views expressed herein.

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REINSURANCE *and*
International Financial Markets

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FOREWORD

The Group of Thirty organized this study on reinsurance and international financial markets to highlight a number of major issues which have arisen as new players enter the international markets on a substantial scale. Financial activities formerly undertaken in the separate worlds of banking, securities and insurance today increasingly overlap. Just as dividing lines between commercial and investment banking have become blurred in recent decades, the evolution of derivatives markets has shifted a range of financial risks into the capital markets. The result is that non-bank financial institutions, including reinsurance companies, now play an increasingly important part in the overall redistribution of risk.

The Group of Thirty organized an informal discussion with reinsurance executives, financial stability experts and G30 members about issues and challenges that might be addressed by a study. The participants reviewed reinsurance activities and, to avoid any overlapping of work, discussed efforts already taking place in the Financial Stability Forum, the IMF, the Joint Forum and the BIS.

Under the leadership of Alastair Clark and Walter Kielholz, the Study Group was created. The Group has devoted much time and effort first, to providing an accurate and accessible account of the structure of the reinsurance industry, its activities and its recent development, and second, to reviewing a number of the major issues confronting the industry at present and suggesting possible responses.

The Study Group is confident that adoption of the reforms it recommends in the key areas of capital markets, risk-based disclosure, and regulation would improve the underlying strength and resilience of the reinsurance industry and provide the conditions and incentives in which it can continue to grow and develop to the benefit of the wider financial community and the global economy.

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The Group also wishes to thank the members of the Study Group listed in Appendix I, as well as the members of the various Working Groups who gave a great deal of time to discussions of the various issues, reviewing papers and making and approving recommendations.

We would also like to thank organizations that provided facilities and hospitality for meetings of project committees and working groups. These include the Bank of England, Ernst & Young, the Federal Reserve Bank of New York, and Swiss Reinsurance Company.

Analysis, drafting and coordinating the efforts of diverse contributors are key to any successful project and a particular debt of gratitude is owed in this case to Peter Brierley for taking on the task of assembling a final report. We would also like to thank our editor Nancy Morrison and our designer Sarah McPhie, for their dedicated efforts and flexibility while working on this project.

In addition, the production and dispatch of drafts and production process had their logistical center here at the G30 offices, and work could not have been completed without the efforts of John Walsh, the Group's former Executive Director, and Geoffrey Bell, Peggy Gelernter, Dawn Hewitt, and James Orr of the Group of Thirty.

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EXECUTIVE SUMMARY

Reinsurance is insurance for insurers. The world-wide reinsurance industry consists of some 150 active providers of reinsurance, which wrote premiums of around $170 billion in 2004. Over 90% of these premiums were written in just eight major reinsurance centers: Bermuda, France, Germany, Ireland, Japan, Switzerland, the United Kingdom and the United States.

The performance of the reinsurance industry over the past decade has been strongly influenced by, first, the underwriting cycle and, second, longer-term developments in natural disasters and long-tail business. In the first half of the 1990s, two of the most costly U.S. natural catastrophe losses in history — hurricane Andrew in 1992 and the Northridge earthquake in California in 1994 — together with damaging storms in Europe and Japan reduced capacity for natural catastrophe cover, which became scarce. This contributed to a substantial hardening of premium rates, which reached very profitable levels around a decade ago. This in turn attracted new capital into the market, and was followed by a wave of mergers and acquisitions in the second half of the 1990s. By the early years of the new century, the ten largest reinsurance groups accounted for around 60% of the market, compared to 40% a decade earlier.

After 1999, the performance of the reinsurance industry deteriorated, reflecting a number of adverse factors. These included the effect of softening markets on underwriting performance; declining investment returns following the major falls in equity markets after 2000; and the impact of the terrorist attacks of September 11, 2001. But the adverse effects on capacity led to a renewed hardening of premium rates, a substantial influx of new capital, and an improvement in underwriting performance after 2002, which has combined more recently with better investment returns. That said, performance in 2005 was adversely affected by the recent very large storms in the Caribbean and Gulf of Mexico, notably hurricanes Katrina, Rita, and Wilma. Latest estimates suggest that the insured cost of these three hurricanes could be within a range of $55–85 billion.

Abstracting from short-term developments, the reinsurance industry faces several major challenges in coming years. One is the ability of the industry to provide cover for risks where demand is increasing rapidly but where the primary insurance industry is increasingly wary of providing cover — for example, longevity, health, disability, and certain casualty and liability risks. Another concerns the capacity of the industry to attract equity investors in a low interest/low inflation rate environment. And a third relates to the willingness/ability of regulators to implement consolidated supervision of major reinsurance groups across jurisdictions, within an international framework based on cooperation and mutual recognition.

In the light of these challenges and some associated concerns about the stability of the global reinsurance industry, the Group of Thirty commissioned a Study Group to assess the issues and, if necessary, make recommendations to address the concerns. The Study Group's report is divided into two parts. Chapters 1and 2 set out the role of reinsurance, identify the key elements of good reinsurance practice, and summarize the main structural features of the industry and the

factors driving its performance. Chapters 3 through 6 review and discuss in detail four issues of crucial importance to the industry:

(1) The extent to which the reinsurance industry is a potential source of systemic risk for the financial system as a whole, and hence the real economy
(2) Whether the securitization of insurance risks through the capital markets offers an opportunity to meet the growing demand for reinsurance by supplementing capacity provided through traditional reinsurance treaties
(3) The appropriate framework for disclosure of reinsurance risks in a manner which could improve the transparency of the industry
(4) The extent to which the current reinsurance regulatory regime is adequate and, if not, how it might be improved.

The first part of the report notes the economic contribution of a sound reinsurance industry. It provides capital relief to primary insurers by allowing them to reduce the level of their retained risks, thereby limiting the impact of adverse shocks on their financial positions and the volatility of their earnings. It facilitates the diversification of primary insurers' risk exposures, allowing them to separate origination from portfolio composition. And it provides a range of additional services to the primary industry, including consultancy, technical advice on underwriting, financial analysis of risks and portfolios, and operational capability in the claims process. Through all these channels, the reinsurance industry, insofar as it functions effectively, enables the risks of the personal, corporate, and public sectors, as well as of the financial sector itself, to be covered more efficiently, cheaply, and securely than would be possible by primary insurance alone.

After describing the recent performance of the industry and summarizing recent trends in its structure, the first part of the report also looks at developments affecting the industry's approach to risk management and the way in which market practices are evolving. The emergence of a lower interest rate environment, consequent partly on lower inflation expectations, together with the growth of an active secondary market for credit risk has induced many insurers and reinsurers to assume a wider range of risks (including credit risks). The larger companies have moved toward more complex risk management practices, involving increased use of financial derivatives in some cases. This development mirrors similar moves some two decades ago by the banking and securities industries, and seems likely to be followed — in a similar way — by a more active approach to retaining and transferring risk.

At the same time, market practices in the reinsurance industry, including the significance of brokers in the intermediation and settlement of obligations, remain diverse across product lines and geographical markets. Contracts are tending to become more formal and detailed, which may reduce the likelihood of legal disputes. But if such disputes nevertheless arise, they are increasingly subject to negotiation and mediation before they reach formal arbitration. These developments are helping to promote the efficiency and professionalism of the industry.

But the industry is still strongly influenced by the regulatory environment. Notwithstanding the nature of the business, which is essentially global, regulation has traditionally been undertaken at a national or regional level, with little consistency of approach across jurisdictions. Current regulatory initiatives should encourage harmonization based on a more consolidated approach with greater reliance on mutual recognition or at least recognition of broad equivalence. This may reduce the previous heavy reliance in some countries on the rating agencies as *de facto* regulators, although their role will continue to be crucial in the reinsurance market as in other financial markets.

Turning to the four key issues identified above, there is no evidence that the failure of an insurance or reinsurance company in the past has given rise to a significant episode of **systemic risk.** Unlike banks, insurance and reinsurance companies are not reliant on first-come, first-served demand liabilities. They are therefore much less vulnerable to losses of confidence and pressures to liquidate assets rapidly to meet cash outflows. To date, however, there has been no outright failure of a large reinsurer. In order to analyze the potential for systemic risk to be generated in a worst-case scenario, the Study Group examined

a sector-wide "stress test", involving the failure of one or more significant reinsurers accounting for 20% of global capacity, arising from an unspecified external shock. Such a loss would be some 35 times greater, on this measure, than the sum of all reinsurance failures from 1980 to 2003. The test examines three potential channels through which such a shock might impinge on the real economy: through its effects on the primary insurance sector, the banking sector, and the capital markets.

There are three ways in which a reinsurance shock might have an impact on the primary sector:

(1) Through the obligations primary insurers would have to meet themselves instead of through reinsurance recoverables
(2) Through direct credit exposures on reinsurers' equities and bonds
(3) Through the possibility that primary insurers would face higher costs in replacing lost reinsurance cover.

Data on cession rates and disclosed net reinsurance recoverables put the losses to the primary sector through (1) at only 2.0-2.5% of global primary non-life insurance premiums. This reflects the fact that only slightly more than 11% of non-life primary premiums are ceded to the reinsurance industry; the remainder of the risk is retained within the primary sector. As for (2), even if all reinsurance industry securities were held by the primary non-life sector, losses from such holdings would only amount to 3-4% of the sector's total investments. In actuality, of course, the primary sector's holdings of reinsurers' securities are much lower. And (3) would probably have only a relatively short-term effect. Given low market entry barriers and the ability of surviving reinsurers to access the capital markets, reinsurance capacity is likely to be restored relatively quickly.

The effect of the reinsurance shock on the banking sector is also likely to be modest, given that the banks' loan and overdraft exposure to reinsurers is small. Most credit exposures are contingent in nature, arising through letters of credit, but only around 25% of these exposures are unsecured. And for most reinsurers, outstanding letters of credit amount to less than 10% of liquid assets, so these reinsurers should have more than enough liquidity to meet either the claims which the letters of credit guarantee or the repayment obligations if the letters of credit are drawn. Reinsurers may also have counterparty exposures to banks through forward foreign exchange or derivatives contracts, so much depends on how these contracts are managed and the extent to which they are mitigated by collateral. As for the possibility that the collapse of a reinsurer in a financial group might undermine confidence in a banking affiliate in that group, there are currently no cases of a major reinsurance firm and a major bank residing in the same holding company structure.

The capital markets channel through which a reinsurance shock might generate systemic risk involves reinsurers' debt and equity investments, plus their credit derivatives transactions. But reinsurers' total holdings of bonds and equities are both below 1% of the respective market totals. Their share of the notional credit derivatives market is more uncertain, but is also estimated by the Study Group to be below 1% of the market. And these contracts would generally be subject to close-out netting, so any losses suffered would be substantially less than the notional amounts.

Overall, therefore, the Study Group finds that even a loss of some 20% of global reinsurance capacity — a loss event many times greater than anything experienced in the past — would be unlikely to cause widespread insolvencies in the primary insurance market and would have only a limited effect on the financial system and real economy generally. The industry assumes only a relatively small proportion of the risk taken on by the primary sector; its linkages with the banking sector are limited; its asset base is small in relation to the size of global capital markets; and its risk profile with respect to credit and other financial risks is closer to that of long-term asset managers than more leveraged financial institutions.

The channels through which developments in the reinsurance sector affect the overall financial sector will be broadened if the **securitization** of insurance risks takes off. This will facilitate greater diversification of risks and provide reinsurers with additional tools for managing their own positions. Insurance securitization currently remains very small relative to

the overall size of the insurance industry and in comparison with other types of asset-backed or similarly structured securities. But securitization can be attractive to insurance companies from the point of view of risk and capital management because it can reduce exposure to counterparty credit risk, offer economic capital relief, facilitate diversification of sources of cover, create more capacity, and complement traditional reinsurance in lines of business for which insurers and reinsurers are showing limited appetite at present. And there are signs that investor interest in insurance-linked securitized paper is widening and deepening as pricing of new issues becomes more competitive and the securities begin to offer better relative value compared with traditional credit instruments.

Notwithstanding the growing interest in insurance securitization on the part of issuers and investors, numerous challenges remain in achieving the efficient transfer of insurance risk into the capital markets. The industry needs to identify, measure, and manage the risks involved in securitization more effectively; work to achieve appropriate capital market pricing; make progress toward greater standardization of transactions; and improve the economics of deals through increased deal sizes. But more important than all this is the need to develop robust risk-based capital models that analyze the basis risk arising from the fact that securitization is unlikely to transfer exactly the same risks to the capital markets as the (re)insurer has written, and to determine the capital necessary to support this remaining basis risk. Such models also must precisely describe the nature of the cash flows to be acquired by investors and need to be understood and accepted by regulators and rating agencies.

In return, regulators and rating agencies need to clarify their treatment of insurance securitization. Regulators should take appropriate account in their calculation of regulatory capital of the transfer of risk effected by a securitization. This should be facilitated by better identification on the part of the industry of the exact nature of the risk transfer. They should also more explicitly recognize that securitization is a valid risk management and balance sheet tool; accept properly constituted special purpose vehicles (SPVs) as counterparties able to provide capital relief; ensure that the solvency margin applicable to SPVs takes into account the collateralized nature of the cover; and consider relaxing the restrictions on investments in insurance-linked securities by institutional investors. Rating agencies need to provide guidance on how a capital market transaction is likely to affect the rating of the issuer and develop more standardized models for quantifying the risks involved in securitizations.

Efforts by the industry to expand securitization, allowing new and existing risks to be managed through the capital market, are unlikely to succeed unless the industry becomes more transparent. The Study Group recognizes that concerns about lack of **transparency** have left counterparties to transactions, investors, and supervisors unclear about the risks the industry is taking and the risk management methods and models it uses. The risk information published by reinsurers varies significantly across firms in both frequency and scope, partly reflecting the lack of common standards for risk disclosure. The Study Group has identified the following principles for delivering enhanced disclosure of risks by individual reinsurance companies:

(1) Managing risks and evaluating their effects on assets and liabilities should be based on an economic view.
(2) Assessing the impact of risk factors (e.g. credit risk, market risk, liquidity risk, and operational risk) on economic capital should involve an integrated evaluation of assets and liabilities.
(3) This assessment should also take into account the relationships between risk factors rather than focus on their stand-alone impact.
(4) Risk measurement methods and assumptions used should be consistent over time to facilitate trend identification and analysis.

Based on these principles, the Study Group has developed a proposed framework for risk disclosure by reinsurers. This is intended as an important complement to existing initiatives in the disclosure area, notably that by the International Association of Insurance Supervisors (IAIS). It extends the approach of the IAIS, based on legal-entity disclosure, by focusing on consolidated, group-level disclosure. The areas covered in the proposed framework are: firm governance and risk management; risk factors; the quality of risk

management; the quality of risk models; stress testing involving an assessment of worst-case scenarios; financial risk exposures and non-insurance/reinsurance activities; and disclosure of available capital.

The Study Group has been careful to ensure that the additional disclosure reflects firms' existing risk management approaches and should not require them to obtain significant additional information or to disclose proprietary information. To that extent, the costs of implementing the proposed new framework should be low. The Group hopes that support for the framework will be forthcoming from the official sector, with appropriate industry groups and regulatory bodies — such as the Geneva Association CRO Round Table and the IAIS — developing guidance and encouraging firms to adopt the framework. The IAIS and individual supervisors might also increase the likelihood of adoption of the framework by making the capital relief obtained by primary insurers from purchasing reinsurance (above a certain threshold) conditional on the reinsurer(s) meeting the IAIS standards and the recommended disclosure requirements.

Turning to the **regulatory environment,** the Study Group believes that the growing role of the major reinsurance companies in the insurance sector and in financial markets more widely indicates the need for a better articulated and more consistent approach to the regulation of reinsurance business. At present, approaches vary widely across countries. In some, reinsurance is regulated in much the same way as primary insurance; in others, it is hardly regulated at all. But change is taking place, driven partly by international efforts aimed at strengthening and achieving greater consistency of supervision. Most major jurisdictions previously dependent on indirect methods of supervision, which look at the effect of reinsurance on the risk exposure and capital requirements of primary insurers, have moved toward more direct supervision, focusing on the prudential soundness of reinsurers themselves. And mutual recognition by supervisory authorities is becoming more widespread, stimulated by the recently adopted EU Reinsurance Directive.

The Study Group has sought to reinforce such changes through its recommendations in the regulatory area. First, it believes that supervisors should review the condition and activities of reinsurance companies on a consolidated basis. Only such an approach provides a comprehensive assessment of a group's financial strength, specific and aggregate risk profile, and risk management approach. Second, regulators worldwide should pursue a more harmonized and standardized oversight framework, based on mutual recognition, an enhanced role for the IAIS, and a supervisory code of conduct for offshore locations of insurance and reinsurance business. To the extent that such a framework addresses concerns about regulatory differences across the major jurisdictions, it may make it possible to eliminate costly collateral requirements imposed by supervisors on cross-border, or sometimes even domestic, business. Third, supervisors need to encourage continued improvements in reinsurers' risk management practices. Finally, regulatory capital requirements need to be risk-based and calculated on a consolidated basis.

The Study Group believes that adoption of the recommendations it has made in the key areas of insurance securitization, risk-based disclosure, and regulation will improve the underlying strength and resilience of the reinsurance industry and provide the conditions in which it can continue to grow and develop, to the benefit of the wider financial community and the global economy.

1. INTRODUCTION AND KEY ISSUES

THE ROLE OF REINSURANCE

Insurers buy reinsurance to cover risks they cannot, or do not wish to, retain. Or, put slightly differently, reinsurance allows primary insurers greater flexibility in adjusting the risks they retain to the capital they actually or potentially have available. It facilitates the diversification of primary insurers' risk exposures and allows them to separate origination from portfolio composition; it enables the financial risks of individuals and corporations to be covered more efficiently, cheaply, and securely than would be possible through (relatively undiversified) primary insurance alone; and it is therefore an important element in the economic value added by the insurance industry as a whole. Reinsurance should limit the impact of adverse shocks on the financial positions of primary insurers and hence reduce the volatility of their earnings, thereby contributing to the maintenance of stable conditions in the primary insurance market. The origins and history of the reinsurance industry are described briefly in Box 1. A glossary of key reinsurance terms is provided in Appendix 2.

Like insurers, reinsurers assume contingent liabilities in return for the payment of an up-front premium. Reinsurance can take many forms, covering all losses for a defined insurance portfolio, a proportional share of a firm's overall exposure, excess losses above a set threshold, or various non-traditional risks. As a rule, a business relationship between a primary insurer and a reinsurer comprises a mix of different reinsurance agreements tailored to the primary insurer's risk situation. Box 2 presents a straightforward example of the protection reinsurance provides in the case of hurricane cover.

By facilitating diversification, reinsurance allows primary insurers to accept more business — larger individual risks or risks that are exposed to accumulations of losses from one event — with the same amount of capital, because the excess risk has been reinsured. Reinsurers are able to provide this and other services, such as consultancy, technical advice on underwriting, financial analysis of risks and portfolios, and operational capability in the claims process, for three key reasons — diversified portfolios, specialized underwriting expertise, and integrated risk management methods.

DIVERSIFIED PORTFOLIOS

Given that the *raison d'être* of the reinsurance industry is risk diversification, reinsurance is almost necessarily a global business. Reinsurers manage a globally diversified portfolio, both geographically and across business lines such as property, casualty, credit, and life & health. Such a diversified portfolio enables a reinsurer to insure risks at lower cost and with higher security than a direct insurer with a less diversified portfolio. Ultimate diversification (sometimes referred to as the "Borch equilibrium") would occur if all reinsurers held a share of every reinsured risk in proportion to their market share.

Optimizing a global reinsurance portfolio demands an ability to operate free from national barriers that limit a firm's ability to achieve the full benefits of diversification. The requirement to establish separate legal entities in individual markets — sometimes stipulated in local law — is an important constraint on the efficiency with which management is able to operate a truly global enterprise. And super-

BOX 1. ORIGINS OF THE REINSURANCE INDUSTRY

The concept of reinsurance dates back to the Middle Ages. The oldest known contract with reinsurance characteristics was concluded in 1370 in Genoa and dealt with marine risks. But it was not until the 19th century that the foundations of the modern industry developed, with the introduction of whole-portfolio reinsurance and the emergence of specialized reinsurance companies. The joint-stock primary insurers that were developing at this time were small and locally based, and thus vulnerable to catastrophic losses. It became clear that — by introducing an additional layer of diversification — reinsurance was the solution to this problem.

The first specialized reinsurer, Cologne Re, was founded in 1846 in Cologne, mainly in response to a devastating fire in Hamburg some four years previously. Similar institutions followed, mainly in Germany, France, Belgium, Austria, and Switzerland, among them Swiss Re (1863) and Munich Re (1880). Widespread reinsurance was slower to develop in the United Kingdom and United States, in the former case partly reflecting statutory restrictions and partly because of the unique nature of the Lloyd's market. This was initially confined largely to marine risks and organized as a co-insurance market. Large risks were from the beginning spread among a number of syndicates, which in turn were backed by wealthy individual merchants in the City of London.

The development of the reinsurance industry in the 20th century was linked to the world economic cycle, together with world wars and political and economic crises. Major natural disasters, such as the earthquakes in San Francisco (1906) and Tokyo (1923), demonstrated the resilience of the industry and its crucial role in extreme loss events. This resilience, and the stabilizing effect of the industry, were underscored by the very small number of insolvencies of reinsurance companies, notwithstanding the voluntary market exits and entries that occur in any industry.

More recently, the industry's development has been closely aligned with economic and technological progress, leading to the emergence of new classes of business, such as satellite insurance in the 1960s. Increasing trade liberalization toward the end of the century has allowed the industry to sustain and promote greater global risk diversification and has encouraged the development of new reinsurance centers, Bermuda being the most prominent among them.

vision of the industry is again largely local, generally involving capital, reserve, and collateral requirements at the state or national level. There is currently no internationally agreed, uniform methodology for reinsurance supervision.

SPECIALIZED UNDERWRITING EXPERTISE

The knowledge accumulated in seeking to construct and manage a globally and sectorally diversified portfolio provides a competitive advantage to reinsurers in assessing underwriting risks. Economies of scale and scope allow reinsurers to invest economically in the expertise needed to analyze specific underwriting risks, such as those associated with natural catastrophes, medical advances, or nanotechnology. This expertise can then be offered through consultancy service to smaller insurers, who do not enjoy the same scale economies, and to other clients.

INTEGRATED RISK MANAGEMENT

Based on their broad underwriting experience, reinsurers have developed integrated risk management tools and methods to address the challenges presented by a complex portfolio of risks, and especially to avoid concentration of risks. Box 3 provides more details on reinsurers' risk management approaches.

REINSURANCE CAPACITY

In addition, reinsurers have been able to attract capital readily when needed to take advantage of increased demand and attractive market opportunities. This ability has been enhanced by the spate of merger

BOX 2. INSURING AGAINST HURRICANES IN THE UNITED STATES AND THE CARIBBEAN

In the United States, Florida and the Gulf states are regions particularly exposed to hurricanes. Recent hurricanes that have produced significant damage are listed below, together with latest estimates of losses.

Year	Hurricane	Estimated loss ($ billion)
1988	Gilbert	0.8
1989	Hugo	4.5
1992	Andrew	17.0
2004	Charley	8.0
2004	Frances	6.0
2004	Ivan	12.5
2004	Jeanne	5.0
2005	Katrina	40.0-60.0
2005	Rita	5.0-10.0
2005	Wilma	10.0-15.0

Note : Losses are not inflation-adjusted. Loss figures for 2005 hurricanes are provisional.
Source : Munich Re

Such multi-billion dollar catastrophes cannot be borne by local insurers without serious, or conceivably terminal, damage to the local insurance industry, even in a major economy like the United States. The portfolio of an insurer solely active in Florida is highly vulnerable to hurricanes. Hurricane Andrew bankrupted 13 primary insurance companies in the southeastern United States in 1992, as the burden of claims far exceeded their financial capacity. This is one reason why insurance companies purchase reinsurance.

The effectiveness of sharing risks through the reinsurance market is demonstrated by Hurricane Gilbert, which hit the Caribbean in 1988. The Jamaican economy was particularly badly affected, with losses of roughly $US1 billion – 70% of those insured. A $700 million payout would have destroyed the Jamaican insurance industry; it survived because nearly 99% of that cover was reinsured. Thus, $690 million was paid by the global reinsurance industry, with a mere $10 million obligation left to the local companies. Reinsurance participation rates for certain categories of catastrophic risk are typically 95% in developing countries, against 50% to 90% in developed countries.

Reinsurance contracts generate substantial net cash flow (premiums against payouts) for global reinsurers from exposed regions like Florida or Jamaica in each year without a hurricane or other major catastrophe. In the case of a major hurricane, however, the global reinsurance industry makes substantial payments for losses and suffers a significant decline in net income.

activity in the 1990s, considered in more detail in Chapter 2. The acquired firms have tended to be less efficient and generally more financially vulnerable, while the acquiring firms have tended to have higher and less volatile returns on equity than the industry average — generally as a consequence of their more diversified portfolios.

While specialized reinsurance companies are not the only suppliers of reinsurance in the global marketplace, they are certainly the predominant ones. Their share is generally estimated to be more than 85%. Primary insurance companies nevertheless undertake a certain amount of reinsurance business themselves. In addition, insurance brokers or other expert agents may analyze the risks and default expectancies confronting a seeker of reinsurance and look to arrange cover from capital market investors, through products structured for this purpose by investment banks.

CHALLENGES FACING THE INDUSTRY

A number of broader factors have combined in recent years to heighten interest in the functioning of reinsurance companies.

First, the importance of a robust and innovative reinsurance industry has been highlighted by several major natural disasters and terrorist actions. These have imposed significant stresses on the reinsurance sector. Although they have been handled without substantial financial disruption, they have nevertheless focused increased attention on the capital resources and risk management capability of the insurance industry generally and, as a crucial part of that, the reinsurance

BOX 3. INTEGRATED RISK MANAGEMENT IN REINSURANCE

The process of integrated risk management refers to the systematic identification, assessment, reporting, control, and active management of the enterprise-wide risks faced by an organization, especially in order to detect risk concentrations arising from dependencies between the various risks. In insurance and reinsurance, this requires an integrated approach to risk management across the following dimensions:

- diverse types of risks, such as insurance underwriting and technical risks, as well as market, credit, and operational risks
- segments, such as primary insurance and reinsurance
- diverse lines of business within a segment, such as property & casualty and life & health
- insurance policies in a particular line of business
- legal entities and geographies
- both sides of the balance sheet, such as asset and liability management
- management reporting lines
- multiple views of risk and capital, such as economic, regulatory, and rating agency.

Integrated risk management does not aim to replace "silo-based" risk management, but rather supplement it with an overarching umbrella that can aggregate the various views of risk and capital to an ultimate shareholder or bondholder level. This aggregation process provides the chief risk officer of a reinsurance company with a powerful instrument for protecting shareholder capital and is also a prerequisite for optimizing the return on that capital.

sector. Indeed, reinsurers are increasingly recognized to be crucial to primary insurers and to global insurance capacity.

Second, in recent years, the boundaries between different kinds of financial activity have been progressively eroded. This erosion has been most evident in relation to banking and capital markets but extends across the financial sector more widely, including insurance and reinsurance. It has been reflected in the growth of financial conglomerates active in a range of different markets, in contractual risk transfers of various kinds, and in the broader range of counterparties that firms take on. Reinsurance companies have participated in this evolution, for example through their involvement in credit risk markets and in the development of structured products of various kinds, providing attractive sources of efficient risk transfer to the capital markets. These increasing interconnections have in turn served to raise the level of interest in the reinsurance sector.

Third, the reinsurance industry has become increasingly concentrated. Some ten firms now account for over 60% of global reinsurance premiums, as against some 40% ten years ago. Although there are good reasons why increased size may deliver competitive advantage, as in other parts of the financial sector, the increased concentration nevertheless means that primary insurance companies, and through them many other economic agents, are dependent on the performance of a relatively small number of reinsurance firms.

Against this background, the reinsurance industry faces a number of important challenges and constraints, which are being addressed but which will need to be decisively resolved in coming years if the industry is to maintain its role in an expanding global economy.

- There is a growing demand for risk cover in segments about which the primary insurance industry has become wary: health, longevity, disability, and a variety of casualty and liability risks. A key issue is whether the reinsurance industry can provide cover for risks that might otherwise be avoided by the primary sector, even though they are some of the fastest growing areas of demand — particularly longevity risk in the developed world and health cover in the developing world.

- The shift to a lower interest rate and inflation environment means that the reinsurance industry is unlikely to be able to generate the kind of investment returns it has enjoyed in the past. It follows that improving underwriting performance will be necessary to deliver the overall returns on equity necessary to attract new capital from investors searching for yield.
- Regulation of the reinsurance industry is increasing, but in piecemeal fashion and without agreement on key techniques and parameters. Well-conceived, internationally consistent regulation, together with consistent legal, accounting, auditing, and actuarial practices, would provide a foundation for a healthy, growing, adequately capitalized industry and reduce the risk of financial instability. The challenge is to ensure that practice in these areas, both by the industry and by regulators, evolves in the right direction.
- There is a widespread perception that publicly-available information about both the financial state and the risk profile of reinsurance companies is in many cases inadequate. Although several companies have taken significant initiatives in this area, there are serious technical issues to be resolved before meaningful disclosure processes are available for the industry as a whole. But the higher profile of the reinsurance industry has reinforced demand for increased and timelier public disclosure, especially concerning information about the consolidated position of reinsurance groups.
- Likewise, rating agency capital models, on the basis of which the capital and financial strength of individual insurers and reinsurers are evaluated, are not always transparent or clearly based on sound risk-based analytics.

Addressing supply constraints will require both that pricing is appropriate to the risks assumed and that capital is sufficient to support the risks. Continued development and refinement of risk-based models should enable the industry to meet this challenge while sharpening its identification of non-insurable risks — those for which probability and impact cannot be modelled or estimated and which will therefore have to be retained by those pursuing that business activity.

Alongside continued improvement in risk analytics, the industry faces a challenge in remedying archaic documentary, administrative, and data management processes. In general, the industry has the data available to develop and support risk-based analytics; but such data frequently are not in a form amenable to ready analysis and not always available to the parties most interested in doing the analysis.

PURPOSE AND STRUCTURE OF THIS STUDY

This study has two main purposes. It seeks initially, in Chapter 2, to set out the main structural features of the reinsurance industry in a form accessible to non-specialists, and to indicate the main forces driving the evolution of the industry. It then reviews and discusses in detail, in Chapters 3-6, four key issues which the Study Group has identified as of crucial importance to the industry and it makes recommendations in three of these areas. The issues, and the associated questions that the Study Group seeks to address, are:

- **Systemic stability** — Would serious disturbances in the reinsurance industry be likely to have a significant impact on the functioning of the financial system as a whole?
- **Securitization of insurance risk** — How far is (re)insurance risk capable of being "sliced and diced" in the same way as other risks, notably credit risk?
- **Transparency** — What is the appropriate extent and most useful form of disclosure to the markets of reinsurance risks?
- **Supervision and regulation** — In the light of the above, are current arrangements for the supervision/regulation of the reinsurance industry adequate? If not, what changes need to be made?

Four Working Groups were formed to address these issues. Their membership is listed in Appendix 1. A bibliography of other studies of the reinsurance industry is provided in Appendix 3.

The *Working Group on Systemic Stability* was charged with examining the question of whether significant disturbances in the reinsurance industry would be capable of disrupting the functioning of the

financial system as a whole. In recent years, concerns about the financial strength of individual reinsurers have been sufficient to raise such questions, and the opacity of the industry has contributed to wider concerns about systemic risk. The Working Group reviewed these concerns in the light of possible stresses to which the reinsurance sector might be exposed and the potential spillovers. It concluded that there is very little evidence to substantiate such concerns about systemic risk, but that this conclusion needed to be qualified by three provisos. First, although a shock in the reinsurance sector seems unlikely to cause widespread problems through contagion effects elsewhere in the financial sector, capacity within the insurance sector itself might be significantly reduced. Second, the lack of transparency and disclosure in the industry meant that the Working Group could not assemble all the potentially relevant information, especially that relating to the industry's counterparties. And third, any conclusion on the wider consequences of problems in the reinsurance sector could change in the future as reinsurance moves into new areas of risk and more sophisticated products, including products for distribution in the capital markets. The Working Group's analysis is presented in more detail in Chapter 3.

The *Working Group on Securitization and the Capital Markets* examined the scope for significant expansion of the securitization of insurance risks. The securitization market, although still small for insurance/reinsurance risk, has undergone significant growth in recent years in volumes, number of issuers, number of risks traded, and the breadth of its investor base. This trend is likely to continue, not least because demand for reinsurance capacity is likely to continue to grow and broader access to capital markets is one obvious way in which the demand might be met.

Under reasonable assumptions,[1] reinsurance premiums could increase by around 80% over the next decade from their current annual level of $170 billion. While the OECD markets will dominate growth in reinsurance premiums and capacity over this period, emerging markets are also likely to be important growth areas, notably China and India.

A significant part of this growth is likely to be met by traditional suppliers whose capacity has increased markedly over the last decade. But the share of reinsurance provided by the capital markets nevertheless seems likely to grow substantially from its current base. At least as important as its role in meeting growing demand, however, is the potential role of securitization in making insurance and reinsurance more efficient, extending the borders of insurability to absorb the evolving risks of modern societies, and providing a deeper and more liquid market as a contribution to capital and balance sheet management. None of this is likely to happen, however, without the development of better risk models by the industry, greater transparency to the markets, and a supportive regulatory environment. These issues are discussed in Chapter 4, which makes recommendations designed to facilitate the growth of insurance securitization. Appendix 4 provides more details of current and prospective developments in insurance securitization techniques.

The Working Group on Transparency looked at the amount and quality of risk information made available to investors, counterparties and the public at large by the reinsurance industry. It noted that the disclosure of risk information varies significantly across firms, but that, overall, market participants and regulators are less informed than they might be about the risks being taken on by the whole industry and how they are being managed. Better disclosure about reinsurers' risk profiles and approaches to risk management seems essential if the industry is to meet the financial challenges ahead. The Working Group welcomed efforts by the International Association of Insurance Supervisors (IAIS) to encourage enhanced risk disclosure.

Building on progress to date, the Working Group developed some proposals for a risk disclosure framework. First, risk management and the impact of risk on assets and liabilities should be based on economic principles. Second, the impact of risk on a firm's economic capital should be assessed on an integrated and aggregated basis, taking into account the relationship between risk factors. And third, risk measurement methods and assumptions used should be consistent

1 The assumptions are that annual demand for reinsurance will grow slightly faster than trend annual GDP in developed markets and two percentage points faster in emerging markets.

over time to facilitate trend identification and analysis. The main elements of a risk disclosure framework respecting these principles are set out in Chapter 5. Appendix 5 provides more details on internal risk models in the reinsurance industry, while Appendix 6 outlines other recent initiatives to enhance disclosure by reinsurers.

Against this background, the *Working Group on Supervision and Regulation* examined current prudential arrangements and supervisory oversight of the reinsurance industry and their adequacy to support the future evolution of the reinsurance market.

If the reinsurance industry does not give rise to systemic risk, and given the sophistication of participants in the reinsurance market, it is legitimate to ask first whether the industry should be supervised at all. The creditworthiness of reinsurers issuing debt or other instruments to the market is already evaluated by credit rating agencies, and the primary insurers, who deal directly with the public and are the main customers of reinsurance companies, are directly supervised. The Working Group considered the rationale for regulation of the industry and concluded that it rested to a significant degree on the importance of reinsurers to the primary insurance sector, and especially on the extent to which primary insurers are able to claim credit for reinsurance in the assessment of their own capital requirements. It also noted that, whatever the theory, the basic issue of whether to regulate reinsurance had effectively been decided. Many reinsurers are already supervised and the clear trend is toward more direct and intensive supervision. This was felt to reflect the substantial and growing role of major reinsurers in the insurance sector and in financial markets more widely, which indicated the need for a better-articulated and more consistent approach to reinsurance regulation. The challenge then is to evaluate what is in place, to see if it passes tests of consistency, effectiveness, and efficiency consistent with the global reinsurance model, and if not to propose changes.

The Working Group found a number of areas in which current arrangements fell short on these criteria, and suggested a number of principles for strengthening supervision and building a more streamlined and harmonized international framework of supervision. Its analysis and recommendations are presented in Chapter 6. Appendix 7 provides more details of current regulatory developments in the major reinsurance jurisdictions.

Finally, the overall conclusions of the report are brought together and summarized in Chapter 7, while an executive summary is provided at the front of the report.

2. THE REINSURANCE INDUSTRY

INTRODUCTION

This chapter summarizes the main structural features of the reinsurance industry as background to an assessment of the issues it currently faces. It first presents a brief portrait of the industry, including its scale, recent performance and approach to risk management; some of the main market features, including the role of brokers; the key principles underlying reinsurance contracts; the way in which obligations are generally settled; and the procedures for resolving disputes. It then gives a short overview of the regulatory environment in which the reinsurance industry operates, focusing particularly on current regulatory arrangements in the major centers of business, recent regulatory initiatives affecting the industry, and the role of credit rating agencies. The chapter also includes a brief discussion of the role of offshore centers, given the particular importance of one (Bermuda) to the reinsurance sector.

The main messages from this analysis are set out at the end of the chapter. The material presented is essentially descriptive, in contrast to the later chapters, which provide a more analytical assessment of the industry and make some proposals to address the challenges confronting it.

A PORTRAIT OF THE INDUSTRY

STRUCTURE AND COMPOSITION

The worldwide reinsurance industry consists of about 150 active providers of reinsurance, who received total premiums of nearly $168 billion in 2004. Non-life premiums accounted for 80% of the total (over $134 billion) and life premiums for the remaining 20% (over $33 billion) (see Table 1). Non-life reinsurance premiums ("ceded" premiums) represented over 11% of the premiums received by the primary non-life sector, against 2% for the life sector.[1]

Approximately half (51%) of total reinsurance premiums arise in North America. Western Europe accounts for about a third (31%) and the remaining 18% come from other regions.

The reinsurance business is dominated by specialized reinsurance companies concentrated in a small number of financial centers. Table 2 lists the top 35 global reinsurance groups. Just over 92% of reinsurance premiums are ceded to reinsurers in eight countries: Bermuda, France, Germany, Ireland, Japan, Switzerland, the United Kingdom, and the United States. In less developed markets there are often just one or two reinsurers, which typically focus mainly or exclusively on their local markets.

Six of the eight countries — including Bermuda, Germany, and Switzerland — are net exporters of reinsurance services, while the United States has traditionally been the largest net importer of reinsurance. The Japanese insurance industry also cedes more business overseas than it assumes from other markets, but most Japanese reinsurance business is domestic: more than 70% stems from pooling arrangements for the country's compulsory automobile liability insurance.

Traditionally the international reinsurers based in Germany, Switzerland, and France have accounted

1 A primary insurer that transfers a risk to a reinsurer is known as a ceding company or cedent. The unit of insurance passed to the reinsurer is known as a ceded premium or cession (see the Glossary in Appendix 2).

TABLE 1. PRIMARY AND REINSURANCE PREMIUMS WORLDWIDE, 2004
($ billion, except where stated)

	NON-LIFE INSURANCE	LIFE INSURANCE
Primary insurers		
Direct premiums[a]	1187.0	1702.5
Reinsurers		
Ceded premiums[b]	134.4	33.4
Cession rate (ratio to direct premiums) (percent)	11.3%	2.0%

a. The figures presented here differ from the ones in Sigma No. 2/2005, "World Insurance 2004", because of different scope and definitions
b. Cessions include only premiums to non-affiliated companies
Source: Swiss Re Economic Research & Consulting

for a large proportion of global reinsurance capacity. Their share totalled 44% in 2003, according to statistics collected by the International Association of Insurance Supervisors (IAIS). Despite some difficulties at the start of the 1990s, the London market is also still a very important trading center for reinsurance coverage. While together Lloyd's and the London-based (re)insurers make up only 8% of worldwide capacity, this relatively low figure belies the importance of the London market because much of the business placed with insurers and reinsurers in Europe and elsewhere is transacted by London market brokers and intermediaries. In the last decade, Bermuda and Ireland have emerged as important offshore centers for all kinds of reinsurance cover. Moreover, it is likely that Bermuda's net export position is understated, given that only two Bermudian companies are captured within the IAIS statistics.

RECENT DEVELOPMENTS

The development of the reinsurance industry during the last decade is closely related to the *underwriting cycle.* In the absence of disasters, reinsurance cover is readily available and premium rates tend to fall. When disaster strikes, large payouts reduce capacity and new cover becomes expensive. A good example is provided by developments in the first half of the 1990s, when two of the most costly U.S. natural catastrophe losses in history — Hurricane Andrew (August 24, 1992) and the Northridge Earthquake in California (January 17, 1994) — together with other damaging storms in Europe and Japan reduced capacity for natural catastrophe cover. This contributed to a firming of premium rates, which reached highly profitable levels a decade or so ago. This in turn attracted new capital to the market and led specifically to the formation of specialized natural catastrophe reinsurance providers.

These specialized providers were all located in Bermuda. Largely because of its tax and supervisory regime and its proximity to the U.S. market, Bermuda developed in less than two years into the most important offshore reinsurance center. Until that time, Bermuda was best known as a center for captive insurers[2] and specialised liability carriers such as Ace and Exel (today XL Capital).

As the underwriting cycle reached its peak in 1994, the industry witnessed a wave of mergers and acquisitions (M&A), which was to last until 2000. The first move was the acquisition of Cologne Re (Germany), the oldest reinsurance company and ranked in the top ten, by General Re (United States). Consolidation then gained momentum, so that 100 insurance groups, which included a total of 139 non-life and composite reinsurers, were reduced to only 51 ten

2 A captive insurer is an insurer that is wholly owned by another organization (generally non-insurance), the main purpose of which is to insure the risks of the parent organization (see the Glossary in Appendix 2).

TABLE 2. TOP 35 GLOBAL REINSURANCE COMPANIES
(premiums and shareholder funds in $ millions; ratios, defined in Appendix 2, in percentages)

2005 Ranking[a]	Group Name	PRIOR RANKINGS[a] 2004	2003	2002	Consolidated Premiums Gross	Net	Total Shareholder Funds	<---------Ratios---------> Loss	Expense	Combined
1	Munich Re	1	1	1	$30,558	$26,408	$26,445	71.8	33.4	105.2
2	Swiss Re Group	2	2	2	28,047	25,789	16,950	72.0	29.8	101.8
3	Berkshire Hathaway Group	4	3	3	13,085	11,816	64,099	69.9	25.2	95.1
4	Hannover Re	3	4	5	13,053	10,129	4,219	81.6	23.1	104.7
5	Lloyd's of London	5	5	6	11,883	7,654	26,242	N/A	N/A	N/A
6	GE Global Ins Hldngs	6	6	4	9,631	8,173	9,415	91.4	26.8	118.2
7	XL Capital	9	9	11	4,764	4,149	7,812	66.3	28.8	95.1
8	Everest Re Group	8	13	15	4,704	4,531	3,713	74.4	24.5	98.8
9	Transatlantic Hldngs Inc Group	12	11	13	4,141	3,749	2,587	75.3	26.2	101.5
10	Partner Re Group	13	14	14	3,888	3,853	3,352	65.5	30.5	96.0
11	Converium Group[b]	11	10	10	3,841	3,553	1,720	90.3	27.7	118.0
12	RGA Reins Co	15	15	17	3,649	3,347	2,279	N/A	N/A	N/A
13	Scor Group[b]	7	7	8	3,449	3,298	2,056	68.5	33.4	101.9
14	London Reins Group	14	12	12	3,068	2,757	3,724	N/A	N/A	N/A
15	Odyssey Re Group (Fairfax)	16	16	24	2,657	2,363	1,586	69.9	28.1	98.0
16	Korean Reins Co[c]	17	18	21	2,209	1,523	401	67.3	29.5	96.8
17	ING Group[b]	19	17	19	2,037	N/A	38,310	N/A	N/A	N/A
18	White Mountains Re	26	29	34	1,933	1,246	3,884	72.6	31.2	103.8
19	Ace Group	23	28	31	1,795	1,745	9,836	69.7	24.1	93.8
20	Caisse Centrale de Reassur	24	27	30	1,784	1,719	1,224	76.8	12.2	88.9
21	Endurance Specialty Ins Ltd	21	33		1,711	1,697	1,863	57.4	28.4	85.8
22	Platinum Underwriters Group	31	21		1,660	1,646	1,133	70.4	27.2	97.7
23	Arch Reins Ltd	20	32		1,658	1,588	2,242	63.5	28.9	92.4
24	QBE	18	23	25	1,600	1,306	3,495	65.3	32.0	97.3
25	Alea Group	29	30		1,583	1,338	706	70.5	32.7	103.2
26	Mapfre	32	35	33	1,545	1,053	734	58.4	33.1	91.6
27	Renaissance Re	27	24	35	1,544	1,349	2,992	81.9	22.5	104.4
28	Aegon	25	26	18	1,494	1,254	978	N/A	N/A	N/A
29	Axa Re Group	10	8	9	1,459	1,441	38,698	80.8	14.7	95.5
30	Toa Reins Group[c]	22	20	23	1,455	1,279	1,320	85.5	23.3	108.8
31	Assicurazioni Generali SpA	30	19	22	1,381	N/A	16,134	N/A	N/A	N/A
32	Chubb	34			1,184	1,139	10,126	62.3	32.8	95.1
33	Aspen Insurance	28			1,178	1,009	1,482	59.6	25.1	84.8
34	Axis Capital Holdings Limited				1,093	1,060	3,238	63.4	21.1	84.6
35	W.R. Berkley	33			963	866	2,155	69.3	29.4	98.7

a. Rankings are based on prior-year gross written premium.
b. Operations were materially curtailed in 2005.
c. Year end is March 31, 2005.

Source: A.M. Best Co. Prepared by Keith Lennox, managing senior financial analyst, and John Laubach, senior financial analyst.

years later.[3] Although M&A activity was the main factor, the reduction also reflected the fact that 19 firms withdrew from the business altogether. But as stock markets declined in the early years of the new century and the cycle reached its bottom, M&A activity almost came to a halt.

From 2000 to 2002, the performance of the major reinsurance groups deteriorated in the face of a number of adverse factors. These included the effect of the soft market conditions in the late 1990s on operating performance; much lower investment returns following the major falls in equity markets and the volatil-

3 According to estimates reported in successive editions of Standard and Poor's "Global Reinsurance Highlights".

ity of bond markets post-2000; credit risk losses due to large and unexpected corporate failures; and the impact of the terrorist attacks of 9/11. These problems led to significant rating downgrades for many prominent reinsurers between 2001 and 2003.

All of this, however, generated another turn around in the underwriting cycle. The capacity shortages associated with the capital drain that followed 9/11 and the other problems set out above hit not just property and casualty (P&C) reinsurance but almost all lines, putting substantial upward pressure on premiums. As a result, another phase of start-up activity began. Over $23 billion of new capital was raised, a significant portion within a few months. Some $9 billion was provided to new Bermuda-based companies. Strategic sponsors, including large insurers and insurance brokers, took the initiative and provided seed capital for the start-ups, while private equity was a much more significant source of capital than in 1993. The underlying performance of the industry improved again, with modest underwriting profits recorded over the 2003-05 period, following the substantial losses of 2000-02.

CONCENTRATION

There is significant concentration in the reinsurance industry. The top ten reinsurers account for over 60% of premiums written, with far higher concentration in life & health (L&H) reinsurance, albeit within a much smaller market, than in P&C business. Insurers typically buy reinsurance coverage from a number of reinsurers, with the share of an individual reinsurer in a particular risk usually higher in life than non-life reinsurance.

Those reinsurers which provide the information in their annual reports for the most part show a non-life portfolio balanced among lines of business and regions. Data from large losses confirm that risks on the books of individual reinsurers are in general not particularly concentrated. But this is not true of some reinsurers based in Bermuda which specialize in single lines of business, such as catastrophe or liability insurance. A similar picture emerges for L&H reinsurance, where there is no evidence of unusual concentration beyond that reflecting a company's market share. This business is concentrated in North America and the UK. The bulk of the risk comes from mortality insurance.

Overall, the evidence suggests that increased concentration in the reinsurance industry has resulted in greater rather than lesser diversification by individual reinsurers. It is possible, of course, that this has been accompanied by reduced diversification of reinsurance cover by primary cedents so that, in the event of a reinsurer failing, individual cedents might suffer greater losses. This risk may be alleviated if ceding companies ensure a good spread of cover among well-diversified and financially strong reinsurers. It should be noted, in this context, that adequate diversification will not necessarily be achieved merely by increasing the number of reinsurers on a cedent's risk mitigation program if those reinsurers are themselves very specialized. It may be achieved more effectively by seeking cover with a smaller number of more diversified reinsurers. The key point is that the cedent should be fully aware of the portfolios, diversification, financial strength, and risk management of its reinsurers.

APPROACH TO RISK MANAGEMENT

Risk management at insurance and reinsurance companies involves the management of both underwriting and investment risks.

Despite their expertise, reinsurance companies can clearly not have perfect accuracy in anticipating and quantifying their underwriting risks. Some lines of business, particularly casualty coverage, have so-called "long tails" in which the time period for identifying and assessing claims can be very long, and uncertainty about the ultimate claims very high. Asbestos is the best current example. The "creeping death" that can result from miscalculations is described in Box 4.

Traditionally, investment risk management at insurance and reinsurance companies has been focused on interest rate and market risks associated with investments in government bonds and equities. In practice, these risks are managed by applying a portfolio approach to large diversified pools of assets and liabilities. Given that cash flows from insurance operations are sensitive to capital market risk, reinsurance companies typically match the cash flows from not-fully-tradable insurance risks with a portfolio of

BOX 4. THE "CREEPING DEATH" SCENARIO

Natural catastrophes such as hurricanes or earthquakes represent major risks for reinsurers; but they can also suffer large losses from the emergence of new and unrecognized risks. Property damage after a hurricane is typically easy to identify and assess within a relatively short time, so claims are made relatively quickly and payment by reinsurers also proceeds predictably and relatively quickly. However, casualty coverage, in particular, may have so-called "long tails" in which the time period for identifying and assessing claims can be long, and uncertainty about the ultimate claims exposure high.

With respect to the timing of a reinsurer's liability for claims, there is uncertainty over the time period until a loss to a third party is first identified; the third party becomes aware of the loss; the third party makes a claim against the insured party; the insured reports the loss to its primary insurer; and the primary insurer reports the claim to the reinsurer. As for the amount of a claim, there is uncertainty whether the insured or the primary insurer has reported an adequate monetary claim to the reinsurer and whether the level of claim is "correct." The level of a claim could depend, for instance, on developing facts about the nature of a risk, such as a court verdict or legal settlement; and on changes in macroeconomic factors such as inflation, which could cause original estimates to be revised. For all these reasons, reinsurers, like primary insurers, regularly update loss estimates for business written in the past, resulting in reserve additions or reserve releases. Re-estimating the ultimate loss and managing this uncertainty is a key element of underwriting and internal risk management within a reinsurance company.

The most prominent example of this phenomenon — and one that is also exceptional in the level of claims involved — is asbestos. A number of firms have suffered substantial losses or even insolvency as a result of worker compensation policies written years or decades before claims emerged. While casualty reinsurance has been a profitable business historically, market participants have to be aware of the specific risks relating to long-tail business. "Creeping death" can result when a reinsurer takes a "pay-as-you-go" approach to underwriting new long-tail business, hoping for profit but carrying an old book of business that is under-reserved.

tradable assets that serves as an approximate hedge. The factors considered in such operations include duration and currency mismatches. Also critical to the risk management strategy are tools for controlling risk concentration, for asset-liability management, and for modelling the correlations and interlinkages between the market-traded and non-market-traded risks.

The emergence of a lower interest rate environment consequent at least partly on lower and more stable inflation expectations, together with the growth of an active secondary market for credit risk, has induced the insurance/reinsurance industry to take a more eclectic approach to the composition of its balance sheet. This in turn has been reflected in a move by the larger insurance and reinsurance companies toward more proactive risk management practices, based in particular on the use of complex capital market instruments. To some extent, this trend mirrors developments over recent years in the banking and securities sectors, as internationally active banks and securities houses have redistributed risks from their balance sheets to other firms or investors with different balance sheet structures and risk preferences. The extent to which large insurance and reinsurance companies may move in a similar way to a more active approach to risk transfer will depend, *inter alia,* on the development of liquid capital markets and, in turn, on the regulatory environment.

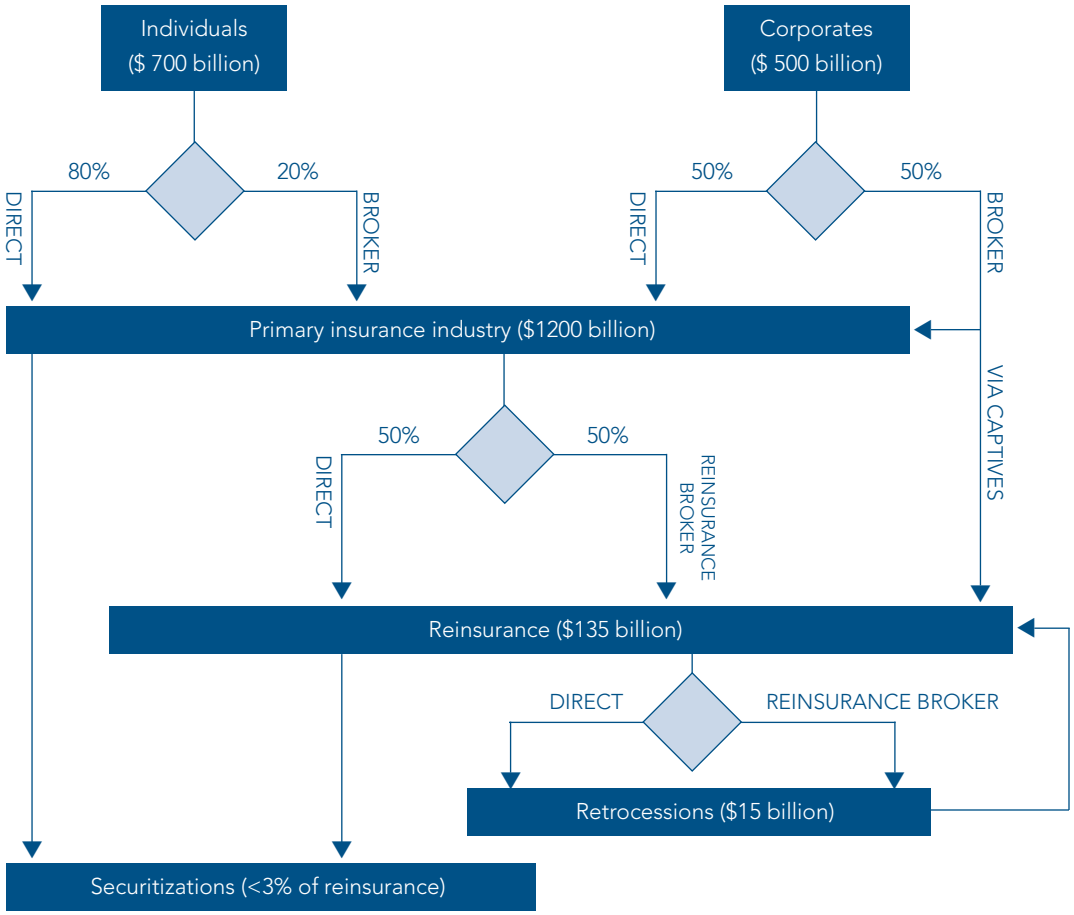
MARKET PRACTICES IN REINSURANCE

ROLE OF INTERMEDIARIES

Reinsurance can either be purchased directly from the reinsurer or placed indirectly through market intermediaries such as brokers. The importance of each channel varies by product line and country.

L&H reinsurance tends to be sold directly, while brokers play a much more significant role in P&C reinsurance. In the United States, more than half of

FIGURE 1. GLOBAL PROPERTY AND CASUALTY MARKET (INDICATIVE FIGURES)



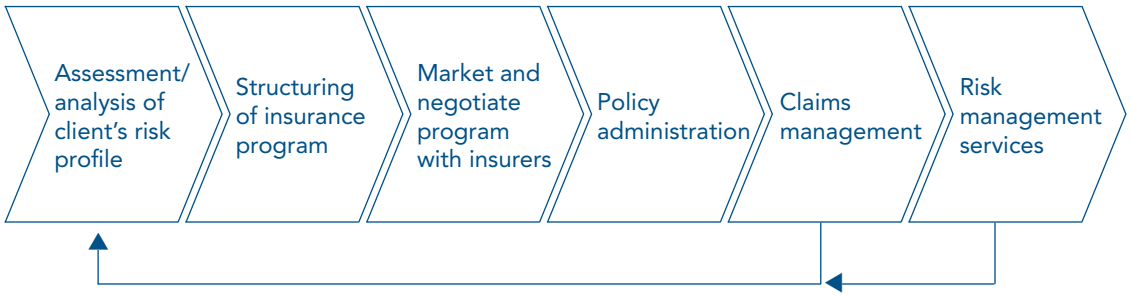
Source: Swiss Re.

total P&C reinsurance business (measured by premiums) is placed through brokers; but direct contact between cedents and reinsurers still dominates in Europe (although the share of brokered business is rising). Bermuda and London are both almost exclusively broker markets. Brokers are significantly more important in placing corporate business than personal business (see Figure 1, which provides a graphic representation of the global P&C market).

Distribution channels are often not exclusive, as cedents will frequently use both direct placement and broker distribution. In the United States, over 80% of cedents use a combination of broker and direct channels, 14% use brokers exclusively, and 5% place business with direct writers only. For most cedents, the distribution channel is less important in deciding which reinsurer to use than other factors, including financial strength, willingness to partner, past relationship, the reinsurer's expertise and reputation — as well as the price offered.

During the past two decades, the role of the broker has evolved from predominantly that of market-matcher to one of service provider to both sides of transactions (see Figure 2). The broker will tend to have greater expertise and market knowledge than the client on the risk appetite available in the market and at what price. A broker's main functions include assessing the insurer's risks and the structuring, placement, and negotiation of an insurance program. Items for negotiation will include, for example, aggregate policy limits, deductible and retention levels, and coverage terms. Services sometimes also extend to

FIGURE 2. VALUE CHAIN OF A TYPICAL COMMERCIAL INSURANCE BROKER



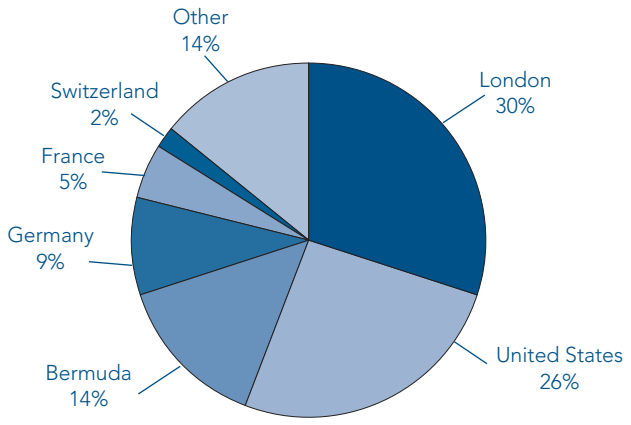
claims and risk management activities, which provide important feedback for the risk assessment process that begins the broker value chain. Reinsurance brokers also advise on retrocessions — the reinsurance of reinsurance.

The aggregate revenue of the leading 40 reinsurance brokers was around $3.2 billion in 2002. The geographic distribution of brokered business is similar to the distribution of overall P&C brokerage. It is highly concentrated, with London and US-based players dominating, and Bermuda in third place. According to *Global Reinsurance* (December 2003), the London market accounted for 30% of the placement of brokered reinsurance, the United States for 26%, and Bermuda for 14% in 2002 (these are the latest figures available on a comparable basis). Other important markets in terms of placement were Germany, France, and Switzerland (see Figure 3).

The leading 10 reinsurance brokers account for 78% of total revenues. Six of the largest insurance broking groups are also among the top 10 reinsurance brokers, with the three leading direct brokers — AON, Marsh, and Willis — also topping the league of reinsurance brokers. In addition to the reinsurance arms of Jardine Lloyd Thompson, Heath Lambert, Arthur J. Gallagher, and Cooper Gay, there are three pure reinsurance brokers among the top ten companies. Benfield and BMS are London-based, while Towers Perrin is U.S.-based.

The changing market environment has increased brokers' responsibilities and obligations, which in turn has resulted in a higher exposure to Errors & Omissions claims. Traditional claims for failing to find coverage have been supplemented by claims for failure to find "adequate coverage", misrepresentation of risks, and delays in processing, and for undertaking transactions with insurers who subsequently become insolvent.

FIGURE 3. PRINCIPAL MARKETS FOR THE PLACEMENT OF BROKERED REINSURANCE



Source: Global Reinsurance, December 2003.

FORMS OF REINSURANCE CONTRACTS

The documentation of reinsurance agreements has traditionally been less detailed, comprehensive, and formalized than in other parts of the financial sector (and possibly in industry more widely). This has sometimes caused difficulties that have the potential to undermine the efficiency and robust-

ness of the financial sector, as detailed below. More recently, there has been a trend toward better-articulated contracts, a development that is most advanced in life reinsurance. Traditional differences between reinsurance contracts and those common in other areas are therefore becoming relevant mainly in relation to non-life reinsurance.

The contract for reinsurance coverage often takes the form of a condensed document (known as a "slip"), containing the essential terms for an offer to be sufficiently specified. The final policy wording is often drafted after inception of coverage — which raises the possibility of legal dispute and more generally the question of how robust existing procedures would prove to be in the event of a crisis. Naturally, both counterparties have an interest in clear and final contracts from the beginning. However, it often takes time to agree the wording of tailor-made contracts, with the result that certain risks remain uninsured until wording is agreed.

The fundamental principles underlying reinsurance contracts are "follow the fortunes" (FtF) or "follow the settlements" (FtS) (the latter is sometimes known as "follow the actions"). The FtF principle links the reinsurance contract to the original insurance policy by binding the reinsurer to any interpretations and modifications of the original policy, subject to any exclusions, limitations, or other deviations stated in the reinsurance contract itself. The risk taken on by the reinsurer will then contain elements that are beyond the control of the primary insurer, most particularly contractual risk — including the risk that the primary company will face claims arising from court or legislative decisions that have given rise to obligations that did not exist when the policy was effected. The FtS principle, in contrast, takes as given the position arrived at between the insured and the primary insurer. It therefore restricts the risk taken on by the reinsurer to elements that are under the control of the primary insurer, as determined in its contractual relationship with the insured, such as risk selection, policy conditions, rating, and claims settlement.

A corresponding fundamental tenet governing the relationship between the reinsured and reinsurer is the principle of utmost good faith — *uberrimae fidei.* A critical element of this principle is the duty of the reinsured to disclose all relevant information to the reinsurer. For while the reinsured and the reinsurer have similar bargaining power, they are not operating under their contractual relationship with the same level of information. This asymmetry of information may also undermine efficiency in the reinsurance industry and provides part of the rationale for regulation of the primary industry.

SETTLEMENT OF OBLIGATIONS

The settlement of obligations — known as clearing — takes place either directly between an insurer and reinsurer, or between the insurer's broker, if one is involved, and the reinsurer. Such clearing typically takes place at predefined dates: quarterly is most common. However, if specifically agreed in the contract, the insurer can request immediate payment in case of an insurance event. This is quite a common feature of non-proportional contracts,[4] which in the case of a loss typically involve bigger payments. The same rules apply to retrocession agreements, the contractual relationships between a reinsurer and a retrocessionaire.

Usually netting is allowed under reinsurance contracts, so that the primary insurer can offset claims due from the reinsurer against premiums owed to the reinsurer. The reinsurer has the same right in the other direction. Netting is allowed not only for individual contracts but for the overall contractual relationship between the insurer and reinsurer. Because insurers, brokers, and reinsurers often operate in different accounting environments, not to mention currency, tax, and regulatory regimes, the clearing process is sometimes cumbersome and imposes a significant administrative burden.

When a reinsurance broker is used, the additional risk of the broker's default is introduced into the settlement process, on top of the counterparty risk arising in the underlying reinsurance contract. In the U.S. market, the broker's counterparty risk is carried by the reinsurer, because it is a precondition for acknowledging reinsurance as capital relief. This results from the wide usage of an intermediary clause that provides that

4 Contracts other than those where the reinsurer shares a proportional part of the ceded insurance liability, premiums, and losses of the ceding company.

payments by the reinsured company to the broker shall be deemed to constitute payment to the reinsurer(s) and that payments by the reinsurer(s) to the broker shall be deemed to constitute payment to the reinsured company only to the extent that such payments are actually received by the reinsured company.[5]

DISPUTE RESOLUTION PROCEDURES

Dispute resolution procedures — whether through arbitration, mediation or litigation — should be set out and agreed in the reinsurance contract. In most cases insurers and reinsurers agree to settle disputes through arbitration, which is binding and usually confidential. Increasingly, however, disputes first go through a negotiation and mediation phase before the arbitration mechanism is invoked. Arbitration would normally follow predefined rules, with the seat of arbitration, timetable, and arbitrator qualifications defined in the contract. Usually both parties have the right to appoint one arbitrator at their sole discretion, with a third arbitrator then appointed by mutual agreement.

THE REGULATORY ENVIRONMENT

INTRODUCTION

Reinsurance is a global business and leading reinsurers add value through global and sectoral diversification of risk. This suggests that, to be fully effective, both risk management and regulation/supervision should also be pursued on a consolidated basis. But in terms of their formal structure, the major reinsurance groups are made up of many legal entities incorporated in a large number of different countries. For that reason, at least in the past, regulation and supervision of reinsurance firms have tended to be undertaken at a regional or national level. Moreover, there have been significant differences of approach across jurisdictions. Coordinating and standardizing supervisory approaches are therefore important objectives, as is achieving an appropriate balance between direct supervision, transparency to the markets, and reliance on sound management at individual firms.

In the European Union, no uniform method of reinsurance supervision has yet emerged, but this situation will change with the adoption of the EU Reinsurance Directive.[6] In the past, pure reinsurers in Europe have been subject to a variety of different regimes, ranging from no supervision at all in some countries (such as Belgium, Greece, and Ireland) to the application of a regime substantially the same as that applied to primary insurers (Denmark, Portugal, and the UK), with a number of intermediate positions.

In Switzerland, domestic reinsurers are subject to the Insurance Supervision Statute, while foreign reinsurers doing business in Switzerland are exempted. Domestic reinsurers need a licence and their operations are subject to continued supervision by the Swiss insurance supervisory authority, the Federal Office of Private Insurance.

In the United States, reinsurers are separately licensed and supervised at the state level. While that suggests considerable diversity, reinsurers licensed in *any* U.S. jurisdiction are subject to essentially the same regulations as primary insurers. However, since U.S. regulators recognize that reinsurance is conducted between sophisticated parties of essentially equal bargaining power, neither reinsurance rates nor forms of contract are regulated. But reinsurers are subject, among other things, to licensing requirements, minimum capital and risk-based capital requirements, investment restrictions, asset valuation requirements, disclosure of material transactions, and supervisory examinations.

REGULATORY INITIATIVES

The regulation and supervision of reinsurance firms is undergoing significant changes in many jurisdictions, with wide-ranging implications. These changes will not only have a direct impact on reinsurers incorporated in those jurisdictions, but may also affect foreign reinsurers operating there. The main current initiatives are summarized below.

European Union

In April 2004, the EU Commission presented a proposal for a "fast-track" reinsurance Directive which,

5 The wording of this intermediary clause is taken from the glossary in the Guy Carpenter website (www.guycarp.com/portal/extranet/utility/glossary_i.html?vid=1), upon which the glossary in Appendix 2 is based.

6 The directive was approved by the European Parliament on June 7, 2005 and adopted by the EU Council on November 7, 2005. Following its adoption, member states have two years to implement it.

when implemented, would establish an internal market for reinsurance like that currently in place for primary insurers under the Third Insurance Directive. As noted above, the Reinsurance Directive was approved by the European Parliament in June 2005 and adopted by the Council of Ministers in November 2005. As with the Directives affecting primary insurers, the concepts underlying the Reinsurance Directive are direct supervision with mutual recognition and minimum harmonization. Under the Directive, an EU reinsurance company, once licensed in one member-state, will be entitled to conduct reinsurance business throughout the EU under the normal "passport" model. Financial supervision of branches will be conducted exclusively on a consolidated basis by the home-country supervisory authority of the parent company. The Directive also contains an article dealing with agreements with non-EU countries in relation to the supervision of reinsurance groups with business in both the EU and these non-EU countries.

OECD

In 1998, the Council of the OECD recommended that member-countries invite insurance companies under their supervision to take all appropriate steps to assess the soundness of their reinsurers. The recommendation referred to a number of possible sources of information, including annual reports and publicly disclosed regulatory submissions. It also established a list of factors to be considered in the evaluation, including legal and statutory framework of the reinsurer, ownership/shareholders, management, performance indicators, technical provisions, solvency, and investments. In October 2002, the OECD Council agreed that member-countries should exchange information on reinsurers "systematically and without delay" covering fraud related to the conduct of the reinsurance business, insolvency and limitation of activities such as run-off, and free disposal of assets.

Financial Stability Forum (FSF)

An FSF Working Group established in 1999 stated in its April 2000 report that examination of the reinsurance industry "yielded little evidence to suggest a significant threat to systemic financial stability." Nevertheless, the group identified some general prudential concerns, including the lack of internationally accepted standards applying to reinsurance, and encouraged the IAIS to develop best practices for reinsurance and its supervision. The FSF also voiced concern about lack of transparency in the reinsurance industry, particularly in the area of cross-sectoral risk transfer and credit risk, which was also taken up by an IAIS task force.

International Association of Insurance Supervisors (IAIS)

Both as part of its regular work program and in response to the FSF concerns noted above, the IAIS has issued a number of standards providing guidance for supervision of the reinsurance industry and taken action to improve the transparency of the industry. Its main initiatives include the following:

- *"Supervisory Standard on the Evaluation of the Reinsurance Cover of Primary Insurers and the Security of their Reinsurers"* (IAIS Supervisory Standard No. 7) was issued in January 2002. It is intended to ensure that the primary insurer has an effective reinsurance strategy in place, covering selection of reinsurers and assessment of their financial security. The standard recommends that supervisors evaluate the reinsurance cover as well as the security of the reinsurers selected.
- *"Principles on Minimum Requirements for Supervision of Reinsurers"* (Principles Paper No. 6) was published in October 2002. It differentiates between supervisory principles common to primary insurers and reinsurers (licensing, fit and proper testing, changes in control, group relations, on-site inspections, sanctions, internal control and audit, accounting rules) and specific principles intended to address characteristics of the reinsurance business (regulation of technical provisions, review of investments and liquidity, capital requirements).
- Building on this principles paper, in October 2003 the IAIS issued its *Standard on Supervision of Reinsurers* (IAIS Supervisory Standard No. 8). This standard focuses specifically on areas

where reinsurers differ from primary insurers and indicates that the supervisory framework needs to be adapted to take into account reinsurance characteristics with regard to technical provisions, investments and liquidity, economic capital requirements, and corporate governance (policies regarding risk management and control). Finally, the standard calls for an exchange of information between supervisors and encourages the establishment of a database on reinsurers.

- In response to the FSF concerns about lack of transparency, the IAIS established Task Force Re (Task Force on Enhancing Transparency and Disclosure in the Reinsurance Sector), charged with preparing global reinsurance market statistics. Task Force Re published a report on April 5, 2004 setting out a framework for collecting such statistics.[7] The work was then taken forward by another IAIS task force, the Reinsurance Transparency Group, which published its first annual report on the global industry statistics in December 2004 and followed that up with a second annual report in December 2005.[8]

RATING AGENCIES AS *DE FACTO* REGULATORS

Rating agencies play several different roles in relation to the reinsurance industry. Perhaps most importantly, they provide information to a reinsurance company's cedents and other counterparties about its financial strength. In its *Global Financial Stability Report* of April 2004, the International Monetary Fund (IMF) stated that "rating agencies have been seen by some market participants as the *de facto* regulator." While any regulatory or supervisory role is firmly rejected by the rating agencies themselves,[9] this perception reflects their wide-ranging role in the reinsurance sector. It is perhaps not surprising given that, in some countries, there is little or no statutory regulation; even where there is, regulatory capital requirements are often lower than those set by the rating agencies for investment grade status.

Ratings help to address the information asymmetries between different groups of market participants — in the insurance sector including policyholders and investors. In the light of the increased complexity of reinsurance business, the importance of such independent assessments is growing. Ratings facilitate a direct comparison of different reinsurers' financial strength. Rating agencies generally provide three types of ratings relevant to reinsurance companies. *Debt ratings* assess creditworthiness with respect to a specific debt issue. *Counterparty credit ratings* assess the company's security from a general creditor's perspective. *Financial strength ratings* judge an entity's overall ability to pay policyholder claims and obligations punctually. Ratings may be *interactive* — that is, requested by a company and drawing on unpublished internal information — or based only on publicly available information.

Most reinsurers carry an interactive rating from at least one rating agency, with some maintaining several interactive relationships. This, as noted above, involves providing additional confidential information, including quantitative analysis of that information; it also draws on detailed discussions with the reinsurer's senior management. In such cases, certainly in some jurisdictions, rating agencies may have more consistent and intensive interaction with the company than do supervisors. In addition, in some areas, rating agencies have used the regulatory framework as a starting point for developing more sophisticated approaches to assessing risk. In that respect, the rating agencies' approach may sometimes be more aligned with the ways companies manage risk.

Financial strength ratings have a variety of uses. They are used by reinsurance brokers and insurers to judge the robustness of the reinsurance "hedge". High ratings play an important role, especially when buying reinsurance cover for long-term lines of business. Supervisors use financial strength ratings when judging whether and to what extent reinsurance justifies capital relief for primary insurers. And in some cases

7 IAIS (2004), "Enhancing Transparency and Disclosure in the Reinsurance Sector", March. Available at: www. iaisweb.org/143taskforcereport5april2004.pdf.

8 IAIS (2004 and 2005), "Global Reinsurance Market Report 2003" and "Global Reinsurance Market Report 2004". Available at: www.iaisweb.org/050303_Global_reinsurance_market_report.pdf and www.iaisweb.org/051215_RTG_report_final_2.pdf respectively.

9 Rating agencies are careful to emphasize that they do not have regulatory power or enforcement authority.

BOX 5. THE ROLE OF OFFSHORE CENTERS

Given the international nature of reinsurance business, companies have considerable opportunities and incentives to identify business locations that minimize their costs and increase their returns. Differences arise because countries differ in terms of standards for capitalization, regulation, disclosure, transparency, and business practice requirements. In recent years, concerns have arisen about certain jurisdictions setting themselves up as places where businesses can "arbitrage" between these various features of national regimes. Exploitation of arbitrage, however, is a global phenomenon and can be addressed only at a global level. Focusing on offshore versus onshore jurisdictions may be misleading and unhelpful. Among offshore centers, there are good, well-regulated, and cooperative ones with well-developed financial markets and infrastructure, and lightly regulated and/or uncooperative ones. Some major reinsurance companies based in OFCs are listed on leading stock exchanges and are therefore subject to listing and transparency requirements as well as rating agencies' reviews.

To the extent that the relocation of insurance and/or reinsurance business to certain jurisdictions is leading to lower standards of prudence, transparency, and business practices, however, this risks undermining the reputation of the industry internationally. This in turn underscores the need for those jurisdictions to act proactively to prevent and respond to abuses so as to enhance their reputations as legitimate places to do business. A number of offshore domiciles have tightened up their insurance and reinsurance regulation in the face of concerns about previous laxity in their regimes and of initiatives promoted by international bodies such as the FSF and the IMF.

The IAIS's inclusion of reinsurance as an activity governed by the 2003 revision of the Core Principles for insurance supervision has provided generally accepted guidance on reinsurance supervision. Of particular importance are principles on corporate governance and on the supervisory arrangements that indicate how the supervisor should verify company information, financial reporting, and balance sheets. The IAIS is also working to improve disclosure and transparency in reinsurance and to provide supervisory guidance on specialized reinsurance products.

These considerations suggest that insurance and reinsurance jurisdictions with inadequate regulation and supervision should tighten their regimes and improve the transparency of their oversight by adopting international standards of regulation and supervision, as well as relevant international financial reporting standards and disclosure practices. The onus on jurisdictions to raise standards could be reinforced by regulators elsewhere giving recognition/credit to primary insurers in their jurisdictions only for reinsurance purchased from reinsurers that are subject to internationally accepted standards of regulation and disclosure.

financial strength ratings figure in reinsurance and funding contracts (as so-called "rating triggers" or "special cancellation clauses").

The key to their attraction is that ratings communicate an evaluation of a reinsurer's complex risk profile in an easily understandable and comprehensive way. Consolidated analysis is facilitated by rating agencies analyzing entire groups, in addition to assigning stand-alone ratings to particular legal entities. Many regulatory regimes still do not provide this overall view. The use of ratings therefore permits market participants quickly to obtain an overview of the financial strength of rated reinsurers, thereby helping to reinforce market discipline.[10] To the extent that rating information reduces uncertainty about the credit quality of reinsurers, it makes their products and debt instruments more accessible for reinsurance buyers and investors. Other indirect advantages from ratings

10 Ratings can be viewed as an opinion on the likelihood that a reinsurer will meet its obligations, taking into account quantitative financial assessments as well as a qualitative assessment of the company's management and risk management capabilities.

include: identifying problems and motivating changes in practice in the reinsurance industry, for example in relation to capital and risk management; requiring access to confidential information, which may in turn lead to additional public disclosures to the benefit of other stakeholders; and developing methodologies and experience that aid reinsurers and their supervisors.

Despite the influence and utility of ratings, the rating agency methodology faces criticism in some areas. For example, the reinsurance industry argues that rating methodologies should reflect an economic view of assets and risks, including important factors such as diversification effects, and that they should be more transparent. The recent evolution toward taking account of internal models in the rating process has been warmly welcomed.

All this clearly demonstrates the importance of the rating agencies' role. But ratings are not and cannot be a substitute for prudential supervision. Rating agencies do not generally enjoy the same access to information and personnel, or the same authority, as do supervisors. International ratings by their nature do not take fully into account national rules of supervision or accounting. Perhaps most important of all, ratings do not take account of the public policy interest in systemic stability, which goes beyond the concern for the viability of individual firms. Finally, ratings are not a substitute for transparency. Some smaller reinsurers, which may be the least transparent, are not rated. Furthermore, as noted above, the ratings methodology itself is not always fully transparent.

OFFSHORE CENTERS

Offshore financial centers (OFCs) have come to play an increasingly important role in recent years as a domicile for insurance or reinsurance activity.[11] The flexibility provided by OFCs has contributed to the efficiency with which capital has been able to flow into the insurance and reinsurance markets when needed. For example, following the events of 9/11, capital was attracted into the offshore reinsurance industry because of the ability to incorporate at a faster rate in these jurisdictions. OFCs have also been the source or place of underwriting for innovative products that have helped raise the efficiency of the industry. Box 5 sets out some of the wider issues raised by the growing importance of offshore locations of insurance and reinsurance business.

SUMMARY

The main points to emerge from this brief sketch of the reinsurance industry are as follows:

- The global reinsurance industry is dominated by large and specialized reinsurance companies concentrated in eight major centers. The market share of the largest reinsurers has increased substantially following a wave of mergers and acquisitions in the 1990s.
- The performance and evolution of the industry during the past decade has been influenced both by the underwriting cycle and by longer-term developments in natural disasters and long-tail business. Following deteriorating performance in 2000-02 associated with stock market weakness and lower investment returns, the impact of 9/11, and the need to increase long-tail reserves, the industry has subsequently rebuilt capacity in an environment of harder premium rates and improving stock and bond markets and recorded modest underwriting profits in 2003-05.
- Risk management practices at reinsurance companies have traditionally been based on the application of standard portfolio management approaches to large diversified pools of assets and liabilities. But a lower interest rate environment has induced the industry to take a wider variety of risks onto its balance sheet — including credit risk — and move toward more proactive risk management practices.

11 According to the IMF (2000), *Offshore Financial Centres: The Role of the IMF,* a practical definition of an OFC is a center where the bulk of financial sector activity is offshore on both sides of the balance sheet and where the majority of the institutions involved are controlled by non-residents. OFCs are usually referred to as jurisdictions that have relatively large numbers of financial institutions engaged primarily in business with non-residents; financial systems with external assets and liabilities out of proportion to domestic financial intermediation designed to finance domestic economies; and centers that provide low or zero taxation, moderate or light financial regulation, banking secrecy and anonymity, or some combination of these factors.

- Market practices in the reinsurance industry, including the significance of brokers in the intermediation and settlement of obligations, vary across product lines and geographical markets. Contracts are tending to become more formal and detailed, based either on FtF or FtS principles. Disputes are increasingly being subject to negotiation and mediation before they reach formal arbitration.
- Regulation and supervision of reinsurance has tended traditionally to be undertaken at national level, with limited consistency of approach across jurisdictions. But regulatory initiatives currently underway should encourage a more harmonized, coordinated, and standardized approach, based on consolidated supervision and (in the EU) mutual recognition. This should limit the tendency to rely on rating agencies as de facto regulators, although the agencies will continue to be crucial in communicating their evaluation of reinsurers' risk profiles in an understandable and comprehensive manner.
- Some offshore centers of insurance and reinsurance business face pressures to strengthen their business environment by adopting and enforcing relevant global standards, including recently promulgated international standards of supervision, financial reporting, and disclosure.

3. COULD THE REINSURANCE INDUSTRY CAUSE SYSTEMIC INSTABILITY?

Earlier chapters in this report have noted a number of concerns about the reinsurance industry, related especially to its lack of transparency, which leaves counterparties to transactions, investors, and supervisors uncertain about the nature and extent of the risks being assumed. Given also that oversight of the industry by regulators and rating agencies is uneven and may in some cases be ineffective, these uncertainties give rise in turn to a deeper concern that the industry could have a destabilizing, rather than a stabilizing, influence on the financial system as a whole.

It is certainly possible to imagine circumstances in which a loss of reinsurance capacity could have a significant impact on the real economy: a loss of cover for aircraft, for example, might effectively shut down the airline industry. Likewise, it is easy to describe catastrophic scenarios that would cause massive losses to primary insurers, reinsurers, and the broader financial system, and damage the real economy directly. A Category Five hurricane hitting Miami or a major earthquake in Los Angeles, San Francisco, or Tokyo are the sort of scenarios frequently cited. The potential impact of such an event could be many times greater than that of Hurricane Katrina.

The relatively limited economic impact of natural and man-made catastrophes of this magnitude suggests that reinsurance has been (at least) moderately effective in buffering losses to the real economy. It is undoubtedly in such times of stress, however, that problems of under-pricing of risk, excessive risk exposures relative to capital, or weaknesses in the management of market risk, credit risk, liquidity risk, or operational risk are laid bare. And so concerns remain that substantial losses at one or more major reinsurance companies could generate a wider impact on the financial system generally.

DEFINING SYSTEMIC RISK

How real in practice, however, is the risk that the reinsurance industry could be a source of systemic risk?

The first step in answering this question is to define terms. This report adopts the Group of Ten's 2001 definition of systemic risk: "Systemic financial risk is the risk that an event will trigger a loss of economic value or confidence in, and attendant increases in uncertainty about, a substantial portion of the financial system that is serious enough to quite probably have significant adverse effects on the real economy." [1] This suggests that, to qualify as systemic risk according to this definition, a shock must be associated with a contagious loss of value or confidence that spreads to other parts of the financial system and disrupts financial activity well beyond the location of the precipitating shock.[2] Furthermore, the disruption of the financial system must be so grave as to be likely to cause a substantial decline in real economic activity.

This definition is consistent with the traditional view of systemic risk as manifesting itself as a result of

1 Group of Ten (2001, p. 126), "Report on Consolidation in the Financial Sector", Basel: Bank for International Settlements, January. Available at: www.bis.org/publ/gten05.pdf.

2 This assumes a reasonably competitive financial system. If, instead, a financial system is heavily concentrated, the collapse of a single firm may qualify as a systemic event. This may be a problem in particular countries, but it certainly is not the case for the international financial system.

shocks spreading through and influencing the banking sector and thereby inducing adverse consequences for the real economy. But it can also be reconciled with a somewhat different interpretation of systemic risk, emphasized among others by the Financial Stability Forum (FSF), which encompasses the effect of a shock in one sector on capacity within that and related sectors, without necessarily disrupting the financial sector as a whole. So far as the reinsurance sector is concerned, for example, a severe shock impairing the ability of primary insurers to perform their functions adequately could have significant effects on the real economy, even if contagion into the banking sector is limited. The analysis in this chapter therefore considers the potential for systemic risk to be generated in either of these senses.

The reason systemic risk has traditionally been a concern associated with banks is because of their central roles in payments systems and the allocation of financial resources, and because their financial structure renders them vulnerable to a loss in confidence. Considerations include the first-come, first-served nature of their short-term deposit liabilities, the relatively illiquid nature of their loan portfolios, and the high degree of leverage they traditionally maintain.[3] A shock may be contagiously transmitted from one bank to another because of actual, direct exposures to the damaged bank; or, more insidiously, because of suspected exposures to the damaged bank, or even merely concerns that other banks may be subject to similar risks.

In the absence of clear and convincing evidence to the contrary, market participants are likely to assume that the institutions least able *ex ante* to withstand a shock have been damaged by it. They will attempt to protect themselves by liquidating their claims on the suspected weaker institutions and reallocating their portfolios in favor of claims on institutions perceived to be stronger. This could result in a general flight to quality in many asset classes which may ultimately result in a serious spillover effect on the real economy. If banks are liquidated, total lending may be cut back by a large amount and a severe recession may ensue. Although in recent financial crises, such as those in Scandinavia in the early 1990s or in the United States in the 1980s, governments have prevented the widespread collapse of the financial system by extensive intervention, historically this has not always been the case. When banks have been allowed to fail in large numbers, the associated economic recessions have often been severe.

An important difference in the reactions to a bank's and insurance company's financial problems lies in their respective liability structures. Insurance companies are not reliant on first-come, first-served demand liabilities and so they are not vulnerable — or only to a lesser extent — to a loss of confidence and subsequent pressures to liquidate assets rapidly to meet the demands of creditors. Life insurance claims tend to be highly predictable and P&C claims can often be paid off slowly.[4] Indeed, there is usually a substantial lag between the occurrence of an event giving rise to a claim, the filing of the claim, the verification of the claim, and the acceptance and payment by the reinsurer.[5] Thus insurance and reinsurance companies are unlikely to find it necessary to liquidate their portfolios rapidly and need not exacerbate market dislocations by rapid sales of assets into markets with falling prices.[6]

3 Today this traditional bank model may be more applicable to small- and medium-sized banks, as large banks are increasingly becoming complex financial institutions that transfer risk off their balance sheets or hedge against it utilizing a plethora of liquid derivative instruments.

4 In exceptional circumstances, insurers have been subject to liquidity problems, but usually from mismanagement of risks inherent in the issuance of certain kinds of capital market instruments rather than traditional insurance contracts. For example, General American Life Insurance Company found itself unable to meet demands for liquidation of a 7-day put contract. General American was subject to a run because it had negotiated a reinsurance contract with a smaller, weakly capitalized insurance holding company (ARM Financial Group). When ARM was downgraded, Moody's downgraded General American as well, precipitating the liquidation of the put contracts. See G. L. Reuber (2000, p. 45), "International Financial Stability: What Risks Arise from the Reinsurance Industry in Offshore Centers and How Might these be Reduced", Office of the Superintendent of Financial Institutions, Canada.

5 Indeed, in some instances payment may be further delayed by litigation.

6 The liquidation of Abbey National's wholesale business, PBU, provides a recent example. A £30 billion portfolio comprising sovereign, corporate, high yield, infrastructure, project finance, acquisition finance, leasing, private equity, and other illiquid assets was easily liquidated within 6 to 9 months without any impact on markets.

As a consequence, and in contrast to banking experience, there has been no evidence so far of the failure of an insurance or reinsurance company being a significant source of systemic risk.[7,8] Although failures of insurance companies can impose heavy private costs and can disrupt insurance markets, they do not appear to have generated significant spillover impacts on other institutions and markets.[9] Nor is there evidence of significant contagion across members of a corporate family from insurance affiliates to banks. For example, ING cut loose a failing insurance subsidiary in London without substantial repercussions on its ability to do business in other lines of insurance or on its banking business.[10]

Of course, the fact that past shocks have not disrupted the financial system is not proof that a sufficiently large future shock would not be a source of wider systemic risk. To analyze the potential for systemic risk under extreme circumstances, we assessed an entirely hypothetical case of a very large shock: the sudden failure of one or more significant reinsurers accounting for 20% of reinsurance premiums ceded (stated as a percentage of total non-life insurance premiums ceded),[11] arising from some unspecified external events. Such a loss would be more than 100 times greater than the failures experienced in 1992, the worst year in the period from 1980 to June 2003, and 35 times larger than the sum of all failures over that period.[12] Given the fact that the largest players have a market share of below 20% and retain at least 90% of gross premiums, this scenario is sufficiently pessimistic to include retrocession effects that might occur if a failed reinsurer transferred risk to another reinsurer as part of a strategy to spread its risks more

7 See Group of Thirty (1997, p. 7), "Global Institutions, National Supervision and Systemic Risk", Washington, D.C. This concluded that insurance companies were not among the core institutions that could be the source of systemic risk: "Core institutions do not include large insurance companies or large finance companies, even those that are very active in international markets. Although these institutions are important by virtue of their size, they present substantially less risk to the system than failure of the core institutions of which they are customers."

8 See also IMF (2002, p. 55), "Global Financial Stability Report", May. This concludes that "many observers – including many involved with the insurance industry in some meaningful ways – have reached a comfort level with the judgment that the international systemic risks associated with the financial market activities of insurance companies are relatively limited…." The report cautions, however, that the collapse of an insurance company could affect financial stability by inflicting losses on counterparties that do play a central role in the payment and securities settlement systems, but this concern applies equally to any large counterparty of a core financial institution.

9 The failure of HIH, an Australian insurance company with operations in Europe, Asia, and North and South America and a large number of creditors that included several globally active banks, provides an example of the collapse of an insurance firm that damaged the real economy, but did not disrupt financial markets. This was the largest failure in Australian history, with losses totaling between $3.6 and $5.3 billion. Nonetheless, the event did not cause significant volatility in Australian or global capital markets (IMF, 2002, p. 54). It did, however, cause substantial dislocations in the construction market, although this appears to have been attributable more to its monopoly position in this market than its status as an insurance company. The commission charged with investigating the collapse of HIH concluded, in its analysis of the rationale for prudential regulation, that "Contagion is less relevant in the insurance industry. The failure of HIH did, however, impose significant costs on other sectors. For example, the building industry was seriously affected when HIH collapsed as builders found it difficult to find warranty insurance cover to projects in some states. This was at least partly the result of the dominance of parts of the builders warranty market by HIH. A market with a larger number of providers may be better able to cope with the failure of one provider than a market dominated by one company." See HIH Royal Commission (2003), "The Failure of HIH Insurance", Volume 1, Commonwealth of Australia.

10 See A. Ladbury (1995), "ING Deal Draws Insurers' Ire, ING's Write-Off of Insurance Units Cited", Business Insurance, March 20, p. 69. Since ING is a financial conglomerate that contains a bank as well as insurance companies, the incident also raises a question about the extent of contagion from a non-bank affiliate to the bank within the group.

11 As a worst case scenario this largely ignores risk mitigation strategies that might be taken by market participants, including the reinsurers themselves. For example, non-life reinsurance business is renewed in general on an annual basis and has relatively low market barriers to entry/exit, so reinsurers and primary insurers have an annual ability to influence the structure of their portfolio and pricing.

12 The hypothetical loss is calibrated as a failure or failures of firms that accounted for 20% of total global non-life premiums ceded in 2004, which equals $29.2 billion. In 1992, firms accounting for $260.6 million of net premiums written went bankrupt; over the entire period from 1980 through June 2003, firms accounting for $820 million in net premiums written went bankrupt.

broadly. The scenario is also sufficiently pessimistic to include a — nowadays very unlikely — "retrocession spiral", like the LMX spiral in the early 1990s.[13]

In addition to the magnitude of a shock, there is potentially a growing range of transmission channels as reinsurance activities expand linkages across firms and markets, and primary insurers and reinsurers become more heavily engaged in capital market activities. To assess the potential for systemic risk to arise, three potential channels through which a shock in the reinsurance sector could impinge on the real economy are examined: (1) a primary insurer channel; (2) a bank channel; and (3) a capital markets channel. The three are not mutually exclusive, of course. However, analysis of the channels separately allows potential linkages to be investigated with greater clarity.

THE PRIMARY INSURER CHANNEL

The first and most direct channel of contagion would arise if the collapse of one or more reinsurance firms created a "cascading" impact on primary insurers, with consequent disruption of the overall financial system and damage to the real economy. There are no historical examples of this happening; so it is important to consider carefully whether there are indeed circumstances in which the failure of one or more reinsurers could plausibly cause significant failures among primary insurers. The transmission mechanism could, in principle, take several forms: through reinsurance recoverables, the primary insurer could be left with a crippling share of obligations in the event of a claim; through direct financial exposures to failed reinsurers arising from their equity or bond obligations; and through higher reinsurance premiums that may result from the loss of reinsurance capacity.

For the purposes of this discussion, global non-life reinsurance premiums ceded are assumed to be $146 billion,[14] out of total global non-life primary insurance premiums amounting to $1,069 billion. The ratio of recoverables against which reserves are held to net written premiums is assumed to be 3:1, significantly above the industry average figures estimated by the IAIS[15] and well above the ratios reported by the major players.[16] This would imply a total of $438 billion of reinsurance recoverables.

Assuming that 100% of the affected recoverables are assets of the primary insurance industry (an extreme assumption since a portion of the recoverables is likely to remain within the reinsurance industry) and assuming a hypothetical loss given default ratio of 30%, the total loss for the primary insurance industry out of an immediate failure of 20% of reinsurance capacity would be about $26 billion (that is, 30% of 20% of $438 billion) — which is less than 2.5% of global primary non-life insurance premiums.

Alternatively, the impact can be estimated from the disclosed amount of net reinsurance recoverables. Fitch[17] reports that net reinsurance recoverables in the U.S. P&C industry (excluding recoverables from pools and associations) were $174.2 billion in 2003. Assuming a failure of 20% of reinsurance capacity with, again, a loss given default ratio of 30% would imply a loss of $10.4 billion for the U.S. P&C industry. Since the U.S. share of total global non-life premiums is close to 50%, the total effect on the primary insurance industry would be about $21 billion.

13 The LMX (London Market Excess) spiral occurred when syndicates inadvertently underwrote their retroceded risks repeatedly. When a series of major loss events occurred between 1987 and 1990, after payment of multiple commissions, there was no longer enough capital to pay the claims. Ultimately all claims were paid, but the incident led to significant changes in the syndicates and market practices at the LMX. For example, most reinsurance contracts now exclude reinsurance assumed and, if not, coverage is usually restricted to first tier retrocessions. The largest reinsurance firms tend to retain at least 90% of ceded premiums and so the multiplier effect of a retrocession spiral is likely to be minimal. See Swiss Re (2003), "Reinsurance – A Systemic Risk?", Sigma, No. 5, pp. 19-20.

14 See IAIS (2004), "Global Reinsurance Market Report 2003", (hereafter referred to as IAIS (2004)), December, pp. 25-26. To calculate the "outer band" we used conservatively the highest figures for non-life reinsurance and insurance within the report. These differ somewhat from the estimates in Table 1 in Chapter 2, because of different definitions and scope.

15 See IAIS (2004, p. 53).

16 The ratio of reinsurance recoverables to premiums largely depends on the business mix written and the type of reinsurance. In general, the higher is the share of long-term business and non-proportional business, the higher the ratio of reinsurance recoverables to premiums.

17 Fitch Ratings (2004), "Reinsurance Credit Trends: An Update", September.

This amounts to a loss of about 2% of global non-life insurance premiums, a bit less than the estimate based on IAIS data, but broadly comparable with it.[18]

On top of this potential loss of insurance recoverables should be added an estimate of the losses due to the fall in value of stock and bond claims on reinsurers. Since reinsurers have in fact issued relatively few bonds, the loss of value in the bond portfolios of primary insurers should be minimal. An upper bound for the total loss can therefore be computed from an estimate of the total market capitalization of the reinsurance industry, some $178 billion.[19] If all these equity claims were held by primary insurers, which is clearly a huge exaggeration of the actual exposure, the loss from the immediate failure of 20% of reinsurance capacity would be about $36 billion. And even if these losses were all concentrated in the P&C industry, this would be less than 3% of European non-life investments or about 4% of U.S. P&C investments.

In addition to direct capital losses, cedents of the failed reinsurers would have to find a new source of reinsurance coverage for the rest of the year[20] and subsequently to replace the lost coverage.[21] Replacement reinsurance coverage might be available only at substantially higher cost. However, given relatively low market entry barriers and the ability of surviving reinsurers to access the capital markets, capacity is likely to be restored relatively swiftly.[22] Thus losses due to more costly replacement coverage are not likely to be significant.

The upshot of all this is that, even under the extreme assumptions made in this scenario, the potential losses to primary insurers do not appear to be large enough to cause major insolvencies. Of course, this analysis has been conducted at the aggregate, industry level and it is possible that the impact on the primary insurance industry could be larger in some sub-segments/lines or regional markets with higher cession rates (for example, aviation). More important, perhaps, the effect could be concentrated on one, or a very few, primary insurers. The effect on an individual primary insurer clearly depends on its exposure to the defaulting reinsurers and ultimately on its risk management practices and capital reserves. Usually primary insurers tend to diversify their reinsurance exposure. Although currently some primary insurers may not fully take account of their overall exposure to individual reinsurers (reinsurance recoverables and investments), regulatory initiatives such as the Solvency II Directive may help to rectify this problem and improve risk management techniques within the primary insurance industry and monitoring by auditors, rating agencies, and analysts.

Short of outright failure, is it possible that primary insurers might be forced to liquidate portfolios of illiquid assets rapidly, thus causing a collapse in asset prices? In view of the liability structure of primary insurers, this seems unlikely. Normally the liquidation of an insolvent insurer proceeds in an orderly fashion without disruption to financial markets. Some kinds of capital regulation might, however, cause this sort of disruption (and not necessarily in the context of a wider financial crisis) if the authorities are not sufficiently flexible.[23]

18 Although it is customary in the industry to scale losses by gross premiums, it would be preferable to scale the loss by the primary insurers' ability to bear or absorb loss. Unfortunately, such data are not readily available on a global scale. Based on data from the National Association of Insurance Commissioners (NAIC) for U.S. primary insurers in 2003, industry and supervisory data for German primary insurers in 2003, and Swiss Re computations for the six largest insurance markets in 2004, it appears that gross premiums written are roughly 70% of total adjusted shareholder funds. If these ratios are representative of the industry, then scaling the simulated losses against total adjusted shareholder funds would produce slightly higher numbers: 3.6% (= 2.5%/0.7) based on the IAIS data or 2.9% (=2%/0.7) based on the Fitch data.

19 The combined market capitalization of Swiss Re, Munich Re, Hannover Re, and SCOR, which have a combined non-life market share of 32%, was about $57 billion at year-end 2004. This figure has been rescaled ($178 = (1/0.32) * $57) for a rough estimate of the market capitalization of the industry. This estimate is based on firms whose primary business is reinsurance. Firms like GE and Berkshire Hathaway, which have significant shares of the reinsurance market but are not primarily reinsurers, do not, unfortunately, break out the proportion of their market capitalization attributable to reinsurance and thus cannot be included directly in this kind of estimate. But if the reinsurance part of their business is valued like that of the firms whose main business is reinsurance, this approach implicitly includes a share of their market capitalization as well.

20 In general, reinsurance premiums are paid in several tranches throughout the year, so the risk of a "lost premium", which was already paid by the primary insurer at the beginning of the period to the failed reinsurer(s), is limited.

21 Alternatively, they may increase their retentions rather than seeking replacement coverage.

22 The significant flows of capital into the P&C industry in the wake of 9/11 illustrate this point.

23 Following 9/11, the Financial Services Authority averted this problem by exercising forbearance with regard to capital requirements.

Finally, there is the possibility that the loss of primary insurance capacity could itself cause systemic problems. This is unlikely to be an issue in the longer term for reinsurance because of low barriers to entry, particularly in Bermuda.[24] It may, however, be more of an issue for primary insurers, given that they are often subject to price controls and substantial restrictions on entry. Thus the supply response, either through new entrants or incumbents, is likely to be much more sluggish than in the reinsurance industry.

In sum, the primary insurer channel of contagion seems unlikely to be important from the point of view of systemic risk. Moreover, even if the analysis had suggested that the loss of 20% of reinsurance capacity might cause significant damage to primary insurers, there would still be a question whether this would be likely to give rise to systemic risk in the traditional sense. One possibility is that defaults by primary insurers might undermine confidence in the banking system and set off bank runs. But this is in substance no different from the bank channel described below, although the scale of exposure might be considerably larger. In addition, affiliations between primary insurers and banks appear to be more significant than affiliations between reinsurers and banks and thus the reputational risks in the latter case are likely to be less.

THE BANK CHANNEL

The second channel for systemic contagion from the collapse of one or more reinsurance firms is that it could transmit directly to the banking system a sufficient shock to cause bank runs, a sharp reduction in the supply of loans, and illiquidity in capital markets. The key issue here is whether reinsurers are different in any important respect from other bank customers of comparable size. Nothing suggests that bank exposures to reinsurers are subject to greater risk or, critically, to risks more closely correlated with the rest of banks' credit exposures. Indeed, credit risk exposures appear to be lower — more like exposures to asset management firms — than to other intermediaries and non-financial firms of comparable size.

The banks' loan and overdraft exposure to reinsurance is negligible, with most credit exposures being largely contingent in nature, arising through letters of credit. The total size of this market is estimated to be $45 to $50 billion, of which no more than 25% is unsecured. For most reinsurers, outstanding letters of credit, whether secured or unsecured, represent no more than 10% of liquid assets, and total liquid assets are generally 100% of total insurance liabilities (some of which are outstanding for many years). They should therefore have sufficient liquidity to meet either the insurance claims that the letters of credit guarantee or the reimbursement obligations if the letters of credit are drawn. (In practice, most claims are settled by wire transfers from the reinsurers and the associated letters of credit are either reduced or cancelled.) Counterparty risk arises primarily from forward foreign exchange and derivatives contracts; accordingly much depends on how these exposures are managed and the extent to which they are collateralized. Of course, concentrations of exposure could cause problems for individual firms and it is possible that heavy insurance-related credit losses could in some cases be the "straw that broke the camel's back".

The additional potential route for contagion between the reinsurance and banking sectors lies in reputational and confidence effects when the reinsurer and the bank are part of the same group. Although some major reinsurers have in the past held substantial "arms-length" equity stakes in major banks, there are currently no cases of a major reinsurance firm and a major bank residing in the same holding company structure.[25] Thus reputational contagion seems unlikely.

24 For analysis of the direct channel for reinsurance, see Swiss Re (2003, p. 14).

25 Allianz might be regarded as a counter-example. The Allianz group controls Dresdner Bank and its holding company (Allianz AG) appears as a leading reinsurer on some lists. But, on closer inspection, Allianz AG is the internal reinsurer for the Allianz group, obtaining more than 85% of its premium income from other Allianz companies. Allianz AG retrocedes about 30% of the premiums. The Allianz group is like other primary insurers that choose to retain a significant amount of premiums rather than ceding them to an independent firm. The issue of contagion in this instance is therefore more a question of whether there may be reputational risk inherent in providing primary insurance and banking in the same financial group. There are a number of groups with this characteristic. It is, however, beyond the scope of this analysis, which focuses on firms whose main business is reinsurance.

THE CAPITAL MARKET CHANNEL

The capital market channel is more speculative than the other two, since there is no historical instance in which reinsurers have directly or indirectly caused capital market turbulence. The fundamental question is whether the increasing involvement of reinsurers in capital markets and alternative risk transfer products may create new exposures that could lead to a transmission of shocks through capital markets.

One issue is the greater speed of reaction in capital markets. Because traditional reinsurance claims are paid out at a measured pace, often over a period of a year or more, reinsurers have a good deal of time to make portfolio adjustments to produce the necessary cash. In contrast, most capital market obligations require immediate payment when due. This raises the question of whether reinsurers could be more vulnerable to bank-like liquidity pressures in the event that the use of such capital market instruments becomes more common. Could reinsurers face an LTCM-style collapse in which they are forced to sell illiquid assets rapidly, or subject to close-out netting procedures, that would exacerbate downward pressures on illiquid markets and transmit losses to other institutions with similar exposures?

Capital market involvement by reinsurers entails both their issuance of equity and a limited amount of debt, but also their investments in debt and equity, and transactions in a variety of derivative instruments including swaps, options, forwards, and exchange-traded financial futures. The effect of a reinsurance shock on the value of reinsurers' own equity and bond obligations, and hence on other firms' claims on reinsurers, was addressed in the section above on the primary insurer channel. This section focuses on reinsurers' assets — that is, their debt and equity investments — and their derivatives transactions. With respect to the latter, many arise from "hedging activities": managing exposure to price, foreign currency, and/or interest rate risk on planned or anticipated investment purchases, existing assets, or liabilities. A reinsurer might also engage in derivative transactions as part of an asset management strategy, with the objective of diversification, or to lock in portfolio positions in advance of the availability of funds, or as part of specialized credit underwriting. The IAIS *Global Reinsurance Market Report 2004* (published in December 2005 and hereafter referred to as IAIS (2005)), in its analysis of the use of derivative instruments by reinsurers, found far greater involvement in hedging activity (that is, risk mitigation) than in non-hedging activities, and that this related overwhelmingly to interest rate contracts (88% in terms of notional amount). In sharp contrast to investment banks, and especially hedge funds, trading is not a focal activity for reinsurers. As a result, reinsurers are less likely to give rise to settlement risk, which can cause systemic problems for other active capital market participants.

As a first approximation, the potential adverse impact of reinsurers on capital market developments is proportional to the size of their positions relative to the rest of the markets for such instruments. Reinsurers' holdings of stocks, bonds, and credit derivatives are all estimated to be below 1% of the total market (see Table 3). Their share of the credit derivatives market is subject to more uncertainty than their share of

TABLE 3. AGGREGATE CAPITAL MARKET POSITIONS OF REINSURERS (US$ billion as at year-end 2004)

	REINSURANCE[a]	TOTAL[b]	REINSURANCE AS PERCENT OF TOTAL
Equities[c]	134.0	37,168	0.36%
Bonds	466.0	57,846	0.81%
Credit derivatives	45.0	5,400	0.83%

a. Reinsurance figures for equities and bonds according to IAIS (2005, Table 5.1, p. 60); for credit derivatives according to IAIS (2005, Table 3.1, p. 55).
b. Totals for equities and bonds according to World Federation of Exchanges (2005) and BIS (2005) respectively; total for credit derivatives according to Fitch (2005).
c. Reinsurance investment in equities of unaffiliated companies only.

the bond and equity markets, but the estimate drawn from the IAIS (2005) data is broadly consistent with that of Fitch (2005).[26, 27]

These exposure data can be used to investigate the "worst-case scenario" — the sudden insolvency of reinsurers with a 20% share of the market — assuming further that the insolvent reinsurers hold 20% of the stocks, bonds, and derivatives held by reinsurers overall. Although insolvency procedures differ across jurisdictions, in most instances there would be no pressure for a rapid liquidation of the portfolio of stocks and bonds. Even if these portfolios were liquidated rapidly, the impact on capital markets should be relatively slight. As Table 3 illustrates, the overall share of reinsurers in global equity and bond markets is quite small — and one-fifth of that share is smaller still.

As for credit derivatives, these contracts would typically be subject to close-out netting and so the losses would be substantially less than the notional amounts. But even the notional amounts (on the 20% market share assumption) would amount only to around 0.17% of the total market. If instead the comparison were with the total market for credit instruments (including loans), the proportion would be an order of magnitude lower — around 0.017%. The magnitude of the involvement of the reinsurance sector in world capital markets simply does not appear to be large enough to cause systemic instability through this channel.

Of course, this analysis is necessarily based on aggregate data, which may obscure problems for particular markets or institutions. Moreover, it is unlikely that the insolvency of firms accounting for 20% of reinsurance capacity would be a discrete, isolated event. An external event causing such insolvencies would quite likely be associated with a loss of confidence in the insurance sector as a whole — at least temporarily — until prices adjusted and capital flowed back into the industry. And there might well be a temporary, general decline in investor confidence that could cause a broader decline in equity prices. But the magnitude of such problems attributable to the reinsurance sector itself (as distinct, possibly, from some external event causing the insolvencies) is unlikely to be sufficiently large to warrant the designation "systemic".

CAVEATS TO THE ANALYSIS

Because there are no examples of a major insolvency within the reinsurance industry, the analysis presented in this chapter is necessarily hypothetical.[28] In addition, as already noted, the analysis is based on aggregate data and, therefore, may not reflect idiosyncratic concentrations of exposure in individual firms to particular counterparties, creditors, or investors that could lead to more serious problems than the aggregate data imply. Unfortunately, the granular data on exposures of leading firms needed to support more detailed analysis are not available. And even the aggregate data used in this study are less detailed than are available in other financial sectors, a consequence partly of the lack of transparency in the reinsurance industry. This relative dearth of relevant financial information makes it difficult to be sure that all the possible linkages within the reinsurance sector and between it and other financial sectors have been properly explored.

One final observation under the heading of systemic risk should be made. Certain developments in the reinsurance sector may give risk to new risks of disruption. The introduction of "ratings triggers" in reinsurance contracts in some markets, particularly the U.S. market, has led some observers to be

26 The notional amount of a derivative is a standard measure of the level of involvement in such transactions, but does not convey any useful information about the amount of market risk or credit risk assumed by reinsurers. It represents the amount used to calculate contractual cash flows to be exchanged. Generally it does not represent an amount to be paid or received, except for certain contracts such as currency swaps.

27 IAIS (2005) includes data from 53 legal entities in seven major reinsurance centers. It explicitly refers to Fitch (2005), "Global Credit Derivatives Survey", New York, November (hereafter referred to as Fitch (2005)), which estimates the gross notional value of credit derivatives for the insurance sector as a whole to be $129 billion, nearly 2.4% of the total market. But this estimate includes the holdings of primary insurers (other than AIG) as well as of reinsurers (excluding monolines).

28 Although there have been a few cases in which the slow deterioration in the financial strength of a reinsurer resulted in its withdrawal from some regions or an entire market, with the respective book placed into run-off, these examples do not provide useful evidence of what might happen in the event of a major insolvency, because the reinsurer in question paid all claims.

concerned that reinsurers could in future face greater liquidity pressures if their creditworthiness should decline. The ratings trigger is a down-grade clause that permits the reinsured to cancel a reinsurance agreement in the event the reinsurer's credit rating falls below a specified threshold, well before the reinsurer's actual insolvency. The consequence of such a cancellation would be a run-off of premiums and reserves at a time when the reinsurer may already be in financial distress.[29] The particular triggering event for a disruption of a given size should not, however, alter the conclusions reached above about systemic risk.

SUMMARY

Although the caveats just mentioned remain a source of uncertainty and could become more significant over time, the overall analysis indicates that the reinsurance industry is unlikely to be a significant source of systemic instability in its broadest manifestation. It suggests that a reinsurance shock would be unlikely to have significant adverse effects on the real economy through the traditional financial contagion channel. Nor would it be likely to have a serious long-term effect on reinsurance capacity overall — although the possibility of a more significant adverse effect on primary insurance capacity cannot be ruled out. Five characteristics of reinsurance firms and their linkages to the rest of the financial system lie at the heart of this conclusion.

- The reinsurance sector is relatively small in terms both of the size of its own investment portfolios and its importance in other firms' investment portfolios. Reinsurers' positions in debt, equity, and derivatives markets seem too small to pose a significant systemic threat.
- The liability structure of reinsurers affords them substantial protection from forced, rapid liquidation of assets under unfavorable market conditions. Insurance liabilities can usually be paid at a deliberate pace, often more than a year after a claim is filed. This structural protection could be undermined by greater capital market involvement because debt and derivative contracts must be paid immediately when due, but the magnitude of such transactions does not yet appear to be sufficiently large to cause concerns.
- Reinsurers do not seem to be more likely to raise systemic concerns than other firms of comparable size. Indeed, the risk profile of reinsurance firms regarding credit risks or other financial risks seems more like that of long-term asset managers than of more leveraged financial and non-financial institutions.
- Insolvent insurers are typically liquidated in an orderly fashion, without rapid sales of assets that might destabilize illiquid markets.
- In terms of capital, the reinsurance industry appears to be both robust and resilient. As the IAIS (2004, p. 45) concludes, "The events of September 11, 2001 indicated that the global reinsurance industry is sufficiently capitalized to absorb even exceptional losses. Strong results in 2003 have enabled reinsurers to strengthen their reserves and the industry to attract new capital." Although average ratings for the industry have drifted downward a bit from 2001, they are just below AA-, comfortably above the minimum investment grade (IAIS, 2004).

For all these reasons, it is hard to foresee an isolated large adverse shock in the reinsurance sector having a substantial systemic impact on the wider financial system.

29 A less common form of trigger clause gives the reinsured the options unilaterally to commute loss reserves or demand that the reinsurer's obligations be collateralized.

4. INSURANCE SECURITIZATION AND THE CAPITAL MARKETS

INTRODUCTION

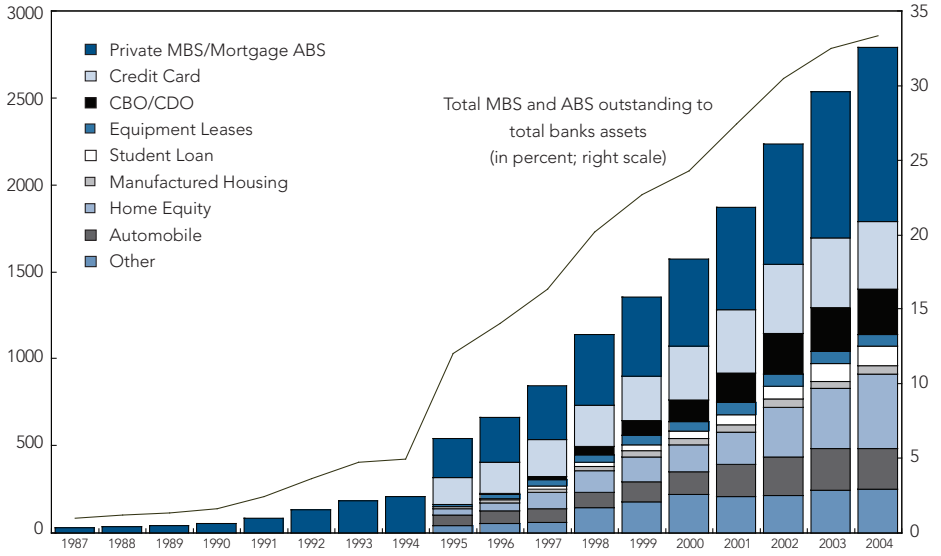
Diversification is a key element in risk management for each of the banking, securities, and insurance industries. While in the banking and securities sectors it has been facilitated by the development of transferable interests in particular credits or exposures more generally, in the insurance sector diversification has been achieved to date through tiering in the institutional structure. Thus primary insurers are able to lay off parts of their exposures through bilateral contracts with reinsurers; and reinsurers are able to achieve diversification by taking on a judicious mix of these reinsurance obligations to primary insurers.

Efforts have been increasing in recent years to securitize insurance risks, thereby reproducing the diversification opportunities available in the banking and securities sectors. At present, the techniques are relatively new and, although the pace of securitization is accelerating, the market remains very small in relation to the total volume of risk on the balance sheets of the insurance and reinsurance industries. But securitization has the potential to grow rapidly, offering primary insurers alternatives to a traditional reinsurance treaty in managing and transferring risk. It promises to expand the reinsurance (and indeed the primary insurance) sector's access to capital significantly, thereby helping to meet the substantial increase in demand for insurance cover that seems likely as the insurance needs of developed countries broaden and developing countries pass through the GDP per capita thresholds seemingly associated with step jumps in insurance demand. That demand would normally be filled by additional reinsurance capacity coming on stream as pricing adjusts to encourage new entrants, but gaps in traditional coverage may arise and persist in certain lines of business, such as longevity, health, and terrorism cover. If it is accompanied by the development of sound risk-based capital models, securitization should help the industry's understanding and pricing of risks where gaps in cover exist. In that event, more insurance and reinsurance risks would seem likely to be securitized in future. Such a development can only be to the benefit of the industry overall, given that it will enhance its understanding and management of risk, the balance sheet, and cash flow. But it will at the same time broaden the channels through which developments affecting the reinsurance sector and securitized insurance risks could have an impact on the financial sector generally.

THE SECURITIZATION MARKET: HISTORY AND PROSPECTS

Insurance securitization started in the U.S. life sector in the late 1980s and, within Europe, is most advanced in the United Kingdom. Successful securitizations have tended to occur in relation to those risks where the data are rich enough to provide relatively precise descriptions of the underlying cash flows. This explains why, in the P&C sector, the bulk of the issues have covered various forms of natural catastrophe. The catastrophic risk (CAT) market grew in the wake of a series of natural disasters, particularly in the United States, in the early 1990s. Yet by 1999 the total public market for insurance securitization in the P&C sector stood at only a little over $1 billion.

FIGURE 4. UNITED STATES: PRIVATE MBS, MORTGAGE ABS, AND NON-MORTGAGE ABS OUTSTANDING (In billions of U.S. Dollars)



Sources: Bond Market Association; Inside MBS & ABS; and Morgan Stanley.

Continued innovation is producing growing differentiation of instruments and risks covered, especially in the CAT sector.[1] Appendix 4 provides more details of the main applications of insurance securitization. It indicates that significant progress has been made in recent years in the CAT, catastrophic mortality, financial event risk, and L& H sectors. The CAT market developed initially to cover the lowest probability and highest severity risks, but some investors are now becoming more comfortable with higher probability events. Catastrophic mortality remains a largely low-frequency/high-severity market, while risks securitized in the financial event risk market include cancellations of events (but not yet, to any significant degree, terrorism, although this cover too may develop in time). Securitization techniques in the L&H sector include: embedded value securitization, relating to expected future profit flows from an existing business portfolio; financing of new business activities (an alternative to traditional financial reinsurance); product-specific applications, such as provision of capital relief on any emerging difference between regulatory and economic provisioning; and excess mortality (or longevity) risk, which provides some form of economic cover for pension funds and annuity providers.

Despite these developments, securitization remains very small relative to the overall size of the insurance industry and in comparison with other types of asset-backed securities markets. The early development of the market was hindered by a lack of analysts and infrastructure dedicated to new securitized products. In the life insurance sector, the vast majority of securitization transactions have been below $500 million in size, and total outstanding issues remain at about $5 billion. Transactions in the life sector nevertheless tend to be larger than in the P&C sector, and P&C transactions remain mainly concentrated in low-probability/high-severity risks and are generally confined to a handful of large insurance issuers. There were an estimated $4.4 billion CAT bonds outstanding at

1 CAT bonds typically receive non-investment grade ratings, primarily because of the potentially large losses or the credit quality of the issuer. However, for structured CAT bonds that contain different risk tranches with varying probabilities of loss occurrence (for example, if a bond's payout provisions are triggered only upon the occurrence of a third consecutive specified catastrophic event within a set time period), a particular tranche may receive an investment grade rating (even a triple-A rating).

year-end 2004 for the benefit of insurance and reinsurance companies. This is estimated to represent just 3% of worldwide catastrophe reinsurance coverage.

In considering what the future may hold for insurance securitization, there may be some clue in the experience of the banking sector, where securitization began some 20 years ago with motivations similar to those now influencing the insurance industry. The development of asset-backed securities 20 years ago was driven by banks seeking to manage their balance sheets more effectively, to improve their capital positions, and to enhance their returns on assets and equity. Traditional lending activities were producing increasingly thin returns while increases in risk exposures and earnings volatility had led to ratings downgrades at many banks. The development of instruments and markets that permitted better risk management and capital optimization allowed banks to implement more risk-sensitive and dynamic balance sheet and capital management systems. This trend was facilitated by the willingness of banking regulators to recognize the impact of securitization on the calculation of regulatory capital. If insurance securitization were to follow a path similar to that seen for banks' credit risks, it would by 2020 reach an order of magnitude of around $1.7 trillion in the United States alone,[2] compared with under $10 billion in total at present. Figure 4 shows the growth of bank securitization: very gradual in the early years, then accelerating in line with the progressive diversification of products. It is still, of course, too early to say whether insurance securitization will in fact evolve in a similar fashion.

Whatever the pace of development, it seems very unlikely that capital market products could be capable of replacing, or even becoming quantitatively more important than, conventional reinsurance as a primary source of cover. Rather, they may have the potential to provide a valuable complement to conventional reinsurance for achieving specific risk and capital management objectives where sponsors' and investors' objectives and appetite are aligned, and, as part of this, for widening and deepening the capital base on which the insurance industry can call.

THE SUPPLY SIDE: SPONSORS' MOTIVATIONS AND BENEFITS

Tradeable insurance-linked securities (and private placements of a similar nature) have been developed as a complement to traditional reinsurance and have helped the sponsors to meet a number of objectives, as follows.

RISK MANAGEMENT OBJECTIVES

As noted earlier, insurance-linked securities have traditionally been used to purchase cover for peak risks, and for low-frequency/high-severity events, although coverage is expanding to new events and new sectors, such as the recent launch of excess mortality transactions in the life insurance sector. There are a number of reasons why securitization is attractive from a risk management standpoint. First, the cover is fully collateralized with highly rated securities, so the sponsor is not exposed to counterparty credit risk even in case of a high severity event and a peak peril. Second, it helps a sponsor to diversify its sources of cover, integrating a conventional syndicate of reinsurers with new counterparties and collateralized cover. Third, securitization can potentially expand access to capital. Fourth, the (typically) multi-year nature of securitized instruments allows sponsors to reserve capacity as well as to fix the premium, thus reducing their exposure to capacity constraints and pricing fluctuations over the reinsurance cycle. And finally, in some cases capital market investors have been willing to insure risks for which insurers and reinsurers have shown a limited appetite on prevailing terms. (Whether this represents an increase in overall welfare depends, of course, on whether those who take on the risk are able to assess it properly!) An extension to new perils and risk profiles is likely to expand the availability of securitization as a risk management tool and its potential use by sponsors.

CAPITAL MANAGEMENT AND FINANCING NEEDS

From a capital management perspective, securitization transactions have generally implied a reduction in sponsors' economic capital requirements. The extent of the reduction will clearly be a function of the terms

2 That is, about a third of an estimated $5 trillion of total assets held by the U.S. insurance industry as of mid-2004.

of the cover and the basis risk which may remain with the sponsor. Sound modeling is necessary to quantify accurately the appropriate adjustment of capital requirements.

Rating agencies have generally been prepared to make allowance for CAT bonds in assessing capital requirements, provided a transaction has been properly structured — and typically treat transactions in a similar way to traditional reinsurance. As the rating agencies are placing increasing emphasis on effective management of low-probability/high-severity risks, this neutral-to-favorable view has facilitated the sponsoring of insurance-linked securities.

Regulators have also been prepared to allow capital relief for securitizations similar to that accorded to collateralized reinsurance, although the details of transactions have had to satisfy local regulatory requirements and have involved extensive discussions with the regulatory authorities. In some cases where regulatory capital relief is secondary to risk management or other capital management objectives, sponsors have decided to go ahead with transactions without seeking relief. In others, however, such as for life insurance companies in the United States that have to comply with the very stringent reserving requirements under so-called "Regulation XXX," regulatory capital relief has been a critical consideration.[3]

Securitizations can help align regulatory with economic capital requirements as viewed by the risk takers in a transaction. This can, for example, relieve life insurance companies of significant capital strains and reduce their use of letters of credit, which have been the primary tool to collateralize capital obligations in the past. The inclusion of a reinsurer in a transaction may increase the likelihood of securing full capital relief and of resolving any regulatory concerns.

Securitization has also been used to provide an insurer with the financing needed to support a business line, notably new business written by life insurers, which involves a combination of up-front expenditure and capital costs that should be recovered over time. Securitization has been used to meet these front-loaded costs as well as providing a new funding source.

Sponsors have also looked at insurance-linked securities to provide contingent capital, readily available when it is needed the most — in the wake of a high severity event. Contingent capital transactions do not provide for risk transfer as such but instead give the assurance of additional resources following a major loss event. They therefore allow claims to be paid promptly (particularly with parametric transactions), as well as bolstering a company's overall capital position and allowing it to underwrite profitable new business after a major loss.

Finally, collateralization of the cover provided through securitization lowers the sponsor's exposure to counterparty risk against its reinsurance providers. A financial event serious enough to trigger an insurance-linked security is also likely to be serious enough to affect adversely the entire insurance industry, including reinsurers, and therefore the security of any reinsurance cover. By contrast, the collateralized nature of an insurance-linked security and the systematic claims payment process means that the cover is more likely to be reliably available.

BUSINESS OBJECTIVES

Securitization has sometimes been instrumental in achieving a specific business objective, such as life insurance transactions structured to exit a line of business or to manage the demutualization process. Securitization may also be useful in the context of acquisition financing or in reshaping the capital and risk profile of target companies in an M&A context.

It is also worth noting that it is not just insurers and reinsurers that have originated securitization transactions. Some recent issues have been sponsored by utilities, non-financial corporations, and public authorities. In those cases, in addition to the objectives discussed above, the issuers' motivations might include achieving a particular risk profile; compensating for lack of capacity in their primary sector; and taking advantage of the availability of different and more attractive terms and conditions of cover than those available in their traditional markets.

3 Regulation XXX, which came into effect in 2000, caused insurers in the United States to increase statutorily required reserves significantly.

THE DEMAND SIDE: A GROWING INVESTOR BASE

The investor base for insurance securitizations has broadened significantly in recent years. In 1999, when the total market for P&C securitization stood at just over $1 billion, approximately 55% of the investors were primary insurance companies or reinsurance companies, attracted by the good relative value of insurance-linked securities compared with traditional underwriting. Money managers represented another 30%, attracted by the relative value of this investment compared with other investments in credit products.

Since 2000, increased market activity and greater diversification of issuers and risks have attracted new capital market investors, with 2003 often cited as the breakout year in the market. This new and growing demand partly reflects a financial and market environment of low interest rates, encouraging a so-called "search for yield", a greater risk appetite, and a willingness to invest in new classes of assets. New investors have also been attracted by the very limited correlation between these alternative investments and the rest of their portfolios, thereby combining above-average returns with greater portfolio diversification. Many of these investors are not connected (directly or indirectly) with insurance and reinsurance companies, so that the overall investor base for bond offerings has increased. Spreads have dropped by about 25% on average; maturities of new issues are significantly longer than in previous years; and a number of issuers have discovered that prices compare favorably with multi-year collateralized reinsurance for the relevant risk.[4]

However, investor interest has not been uniform across all products or regions. For CAT bonds, the base now includes pension funds, hedge funds, and specialized mutual funds.[5] In the life insurance securitization market, by contrast, interest has been narrower and confined thus far to very sophisticated investors, with a thorough understanding of the underlying risks. In the case of Mutual Securitization, the first life insurance embedded-value securitization, approximately 80% of investors were other insurance companies. Transactions involving these investors have to date largely been private placements in the United States, with the United Kingdom the most active European market. Development of a more liquid and public market may hinge particularly on further progress toward standardization of contracts and products.

There are other indications of the continuing immaturity of the insurance securitization market, such as the fact that many transactions to date have been heavily over-collateralized and have sometimes included third party guarantees. Most life insurance securitizations, for example, have included a credit "wrap", under which the issuing company pays a premium to a third party (typically with an AAA rating) for its guarantee of the interest and principal payments on the underlying securities. This insulates investors from direct exposure to the credit risk associated with the issuing company.

Still, while the annual issuance of new unwrapped P&C securities remains only $1-2 billion, the overall market has grown to approximately $4 billion in 2004 (compared with $4.4 billion of CAT bonds), with primary insurers and reinsurers now representing only 7% of the investor base and money managers accounting for up to 40%. New entrants are dedicated funds investing exclusively in insurance-linked securities (now about 33% of the investor base) and hedge funds (representing about 16%).

This widening of investor interest beyond insurance and reinsurance companies in a relatively short period is evidence of the competitive pricing of new issues and the relative value offered by insurance-linked securities compared with credit investments. The growing number of potential buyers is deepening the market and overall liquidity has improved, with some participants now focusing on a market-maker function.

Hedge funds and some dedicated CAT funds are also active in the private placement market, where outstandings are estimated to total about $1.5 billion. This market is inherently less liquid, but its relative

4 Another sign of such unusual conditions in the market in 2003 was the fact that a non-rated issue (Formosa Re) was enthusiastically accepted in the market. In addition, Electricité de France gained coverage in December 2003 against new windstorm risks through two direct issues on the capital markets, instead of using the traditional insurance markets.

5 Dedicated CAT bond funds represent about 33% of the investor base in the CAT market at present, compared with only 5% in 1999.

BOX 6. SPECIFIC IMPEDIMENTS TO SECURITIZATION

LEGAL ISSUES. A robust legal framework is essential to the safety of any financial transaction, yet it is not clear that any insurance securitization has been truly tested with a loss. There are also issues such as whether a transfer of insurance risk is a "contract of insurance" under the appropriate regulatory regime, in which case the capital market vehicle or even the end-investors may have to be regulated entities, entitled to conduct insurance business.

CONTRACT STANDARDIZATION. Large, liquid markets that are simple for investors and have low frictional costs, require a standardized contract framework. For many insurance risks, defining a broadly accepted event of loss and amount of loss is a major challenge.

DATA AND MODELING. Reliable and widely available data and reliable modeling techniques are necessary for investors to feel that they understand the risk they are assuming. Catastrophe modeling has advanced enormously since the advent of the CAT bond market, but the insurance community is still struggling with modeling key risk elements. Because it is unlikely that securitization will transfer exactly the same risks to the capital markets as the (re)insurer has written, basis risk will be an issue. Developing robust models for basis risk and the capital necessary to support it that are understood and accepted by rating agencies and regulators is essential to the future of securitization.

RISK DISCLOSURE. Investors typically demand a lot of detailed information and analysis, while insurers may be reluctant to disclose proprietary business information. While that is an important consideration, the insurance industry must become comfortable with expanded disclosures, just as banks disclose mortgage, credit card, leasing, and loan information.

LACK OF APPROPRIATE INDEXES. One solution to the modeling and risk disclosure impediments to securitization is the use of indexes. However, for most insurance risks, there is a lack of widely accepted indexes that are objective, consistent, transparent, and credible, with frequent and timely reporting and history available for analysis. Even if an index is available, use of indexes also introduces basis risk. This risk is often small but becomes difficult to quantify and may be larger than expected in the case of "tail events", exactly when protection is most needed.

TRANSACTION COSTS. Investors are likely to demand novelty and liquidity premiums for non-standard risks before a liquid and tradable market develops.

RATING CAPS. Rating agencies cap the rating on insurance-linked securities, which produces ratings that do not reflect the annual expected losses on the transactions. This practice increases the cost of transactions in the most remote layers where the benefit of collateralization for the industry is greatest.

RECOURSE. Most securitizations outside the insurance sector involve a "true sale", where assets are sold to a Special Purpose Vehicle (SPV) with no recourse to the issuer. It is not clear that such a true sale can be achieved with insurance risk.

value and the diversification benefits it offers have been sufficient to attract new investors.

The growing range of securitized products is likely to attract further groups of investors: for example, in the life insurance sector, those with an appetite for longer dated paper and a mixture of credit and event risk.

CONSTRAINTS ON SECURITIZATION

Notwithstanding recent growth, numerous challenges remain to the efficient transfer of insurance risk in the capital markets. Although capital markets have proved their ability to assume some well-defined individual risks and portfolios of business, the bulk of reinsurance risk is still not easily transferable. Complex, non-standard risks that cannot be modeled, or risks with a limited loss experience, have typically been retained within the reinsurance market.

Some of the constraints on widespread securitization of insurance risks also arise, however, from characteristics of the capital markets themselves. The risks

involved in insurance securitization are heterogeneous. Given that securitizations are set up under the rules of specific jurisdictions and regulatory regimes, the structure and documentation used for one risk may have only limited application to others. This is particularly true in the life sector. There are also problems of scale, since for many small and medium-sized insurers, the size of transaction they can bring to market may be too small to realize the efficiency and economic gains available for large transactions.

A number of more technical challenges also arise in the process of securitization. These are summarized in Box 6. Overcoming them will require the expertise and cooperation of bankers, lawyers, rating agencies, and regulatory authorities, as well as the insurance/reinsurance industry itself.

Beyond the limitations of the market and technical issues, a key challenge is broadening investor appeal. Although progress is being made, many insurance securitizations still appeal only to a very narrow segment of the investment market. Private placements may help resolve specific challenges for individual transactions, but the lack of disclosure does nothing to raise general awareness of insurance securitization, move the debate forward on standardization and simplification, or help achieve broader acceptance. Justifying the time and resources required for investors to develop the necessary expertise will require a flow of tradable securities, but the emergence of a broad and deep market will require knowledgeable and sophisticated investors. This is a classic "chicken and egg" problem. Finally, while the benefits of diversification through investment in insurance-linked securities are widely accepted, the insurance funds and pension funds that control some of the largest pools of savings are already exposed to many of the risks being securitized.

Given the complexity of some of these challenges, overcoming them is likely to require an external stimulus. In the absence of a strong and clear-cut economic rationale or deliberate official encouragement or facilitation, rapid growth in securitization is unlikely to occur.

In that context, the regulatory treatment of insurance securitization is an important consideration. Although insurance securitizations typically mirror reinsurance contracts in their economic impact, the regulatory, tax, and accounting treatment may be different. As noted earlier in this chapter, a key issue is whether the insurer can obtain full credit in regulatory capital calculations for the risk-shedding afforded by the securitization. Existing regulations rarely contemplate such transactions and there is limited guidance or understanding of how the transactions should be treated. The issue has become more pressing given the rapidly evolving framework for insurance regulation in many jurisdictions, which in turn is driving a wave of change in the risk management techniques of many insurers.

Another key issue is the role of rating agencies (see Chapter 2), which provide an important, independent analysis of capital market transactions, upon which many investors rely. One effect of their central role is to add an additional cost to a capital market transaction, as compared with a traditional reinsurance transaction that does not involve a rating. There is also a need for greater clarity in some areas about how ratings are developed: for example, the treatment of securitization for debt-ratio purposes (that is, as operating leverage rather than financial leverage) and more broadly its impact on an issuer's rating. This parallels the issue about regulatory treatment. Finally, rating agencies do not yet have fully standardized methodologies for quantifying and rating insurance risk transactions. More work is needed in these areas.

OVERCOMING THE CONSTRAINTS

There is significant potential for the securitization market to develop and expand if the level of knowledge and understanding amongst market participants, the authorities, and other interested parties were to increase. Specific actions by each of them are needed.

THE INDUSTRY

The first priority for the insurance/reinsurance industry is to identify, measure, and manage effectively the risks involved in securitization. This includes more precise identification of the risk transfers involved (which, as noted below, may contribute to the regulatory recognition of those risk transfers) and bringing out more clearly the relationship between reinsurance risk and general capital market risk.

The industry also needs to encourage appropriate capital markets pricing. Risk transfer prices in the capital markets have been converging with reinsurance pricing in recent years, particularly for peak risks. This reflects the current level of reinsurance prices and the low level of interest rates and credit spreads, but it is not clear whether this convergence will persist in a downward reinsurance cycle combined with an increase in interest rates and credit spreads. The outcome will be decisive for the future competitiveness of the capital markets as a supplement to traditional reinsurance.

For some risks, capital market prices have not yet converged, perhaps partly because models have not been available to provide the necessary comfort about risk and return to capital market investors. A challenge for market development will be to ensure that those buying protection compare costs on a like-for-like basis: that is, the cost of a capital market transaction against the equivalent all-in alternative cover (such as a fully collateralized multiyear insurance).

The industry also needs to make more progress toward standardizing the terms of transactions. So far every public securitization has been more or less unique. However, some structural features — such as the use of SPVs, documentation flow, and the characteristics of the notes — are achieving a degree of standardization. This has helped reduce the up-front costs for risks that have already been included in a securitization. Synthetic triggers have been established as market standard, eliminating any requirement for sponsors to reveal sensitive portfolio data, which slowed development of the market in the past.

There are, however, other areas where greater standardization and product development are still needed. Establishing standardized synthetic indexes for risks (such as natural catastrophe risks) is one. Where institutions are reluctant to accept synthetic triggers because of the difficulty of assessing the basis risk, reinsurers could perform an important function by taking on this risk and transforming indemnity-based reinsurance into a synthetic securitization.

The industry also needs to increase deal size and improve the economics of deals for all parties. This may be facilitated by pooling and warehousing transactions initiated by small or medium-sized sponsors. Possible standards in this area should be explored, recognizing that it could be difficult to combine cedents in the same transaction unless the risks have very similar characteristics or they are prepared to accept a certain degree of basis risk.

Although from one standpoint reinsurers may view securitization as a threat, they can also play an active role as problem-solvers in developing the process: for example, as aggregators of smaller risks, and by taking the basis risk between an index and an insurer's actual portfolio. Swiss Re's very proactive stance is noteworthy and has allowed them to increase substantially their role in the CAT bond market since 2003.

The industry needs also to make further progress in model development and availability. Capital markets typically require a third party to assess the probability of loss for a particular coverage, and such models are not yet available for all the main risks (such as flooding in Europe). However, models can be developed for many of the principal risks, particularly natural catastrophes, without great difficulty. This requires that the sponsor planning to place that risk in the capital market is willing to devote the time and expense needed to develop an acceptable model.

The majority of securitization transactions still revolve around low-probability natural catastrophes, a typical short-tail risk that would generally be expected to be relatively easy to assess or price.[6] On the other hand, there are serious hurdles to overcome in securitizing long-tail business, such as casualty coverage, which requires long periods for final determination of the profit or loss. Most investors want to know their position at the maturity of the investment. If that is not possible, the additional period of uncertainty must be compensated by a premium, which adds to costs after the actual end of the transaction period ("risk attaching basis"). Developing a structure that would allow long-tail risks to be traded in the capital markets is an important challenge.

Transaction costs, covering placement, legal, rating, modeling, and SPV costs, can be substantial and are an obstacle to attracting a broader sponsor base. How-

6 Hurricane Katrina has challenged this assumption because the flood damage appears not to have been properly modelled.

ever, parametric index trades have reduced transaction costs and have been successfully marketed. Transaction costs have also been greatly reduced for private placements, involving bilateral transactions that eliminate the need for a rating or even an SPV and are targeted at medium-level exposures. The industry needs to explore additional mechanisms for reducing transaction costs.

INVESTORS

As noted, the attraction for investors revolves importantly around the availability of a yield that is not correlated with traditional investment markets. In the context of Efficient Portfolio Theory, insurance risk is regarded as a zero beta asset, uncorrelated with the returns of the broader investment markets, and thus a diversifying addition to any investment portfolio. Investors should therefore be attracted to this category of security if certain issues can be resolved. Addressing many of the hurdles faced by issuers will be equally relevant for investors, such as increasing familiarity, deal flow, model availability, and standardization of terms.

REGULATORS

In some jurisdictions, changing regulatory, legal, and accounting environments have given rise to uncertainty about how capital market transactions affect insurers' statutory net worth and capital requirements and thus have slowed the progress of some initiatives. Regulatory recognition and treatment of securitizations as an appropriate risk management and balance sheet management tool needs to be more explicit. This involves accepting SPVs, whether corporate or reinsurance structures, as counterparties that are able to provide solvency capital relief. Solvency margins applicable to SPVs need to take into account the collateralized nature of cover. These regulatory advances will be encouraged if the industry succeeds in more accurately identifying the precise risk transfers involved. Finally, it would also be helpful if the limitations on investments in insurance-linked securities by institutional investors were relaxed.

RATING AGENCIES

Rating agencies have published numerous notes on insurance securitization in an attempt to promote development of the market. Because each transaction is different, however, ex ante guidance is still lacking on how a transaction will be rated or on its impact on the rating of the issuing entity. Rating agencies could help by developing and publishing standardized techniques for quantifying risk and rating transactions and providing greater clarity on how a securitization may affect an issuer's ratings.

SUMMARY AND RECOMMENDATIONS

The deeper and more liquid market for insurance securitization that is evolving has the potential to offer significant benefits to the insurance and reinsurance industry and to the economy more widely. If the market continues to develop and grow, it will be able to provide a large alternative capital base, expanding both capacity and the ability to provide risk management and capital solutions.

Securitization is not, however, likely to replace reinsurance or insurance products as a primary source of cover. Rather, as it did for the banking industry, it could become a key element in the capital and balance sheet management armory of the insurance and reinsurance industries. Occasionally, it will also be a source of direct cover for industrial corporations.

While insurance securitization remains small relative to the size of the insurance industry, its pace of growth, both in the value of transactions and the range of risks covered, is accelerating. More sponsors are using securitization, both in the P&C and life sectors; more diverse risks are being introduced to the market; and a broader investor base has been attracted to the sector, enabling the placement of highly rated securities as well as non-investment grade risk. The relative attractiveness of this asset class to investors will undoubtedly be influenced by the spreads available on other investments.

From the perspectives of both insurers and reinsurers, perhaps the single most important constraint on accelerated development of the securitization market is insufficient granularity of data and analytical support for the industry's risk and capital models. Because securitization is unlikely to transfer exactly the same risks to the capital markets as the (re)insurer has written, there will be basis risk: a gap in either or both the nature or timing of the risk written and the

risk placed. It is essential to develop robust models to analyze this risk and determine the capital necessary to support it in a way that is understood and accepted by regulators and rating agencies. In particular, better identification of the exact nature of the risk transfer is an essential precondition to regulatory recognition.

The insurance industry must take the lead in developing risk-based capital models that enable the risks and capital associated with different types of insurance contracts to be determined in greater detail. This will increase the chances that the industry, regulators, and rating agencies will agree not only on the capital "relieved" by the securitization, but also on the capital required to support the basis risk remaining on the insurer's or reinsurer's balance sheet. The models will enable the cash flows, risks, and capital associated with the risks generally covered by an insurance treaty to be broken down into component parts. Securitizations frequently distribute the risk on some of those component parts, and the characteristics of the risks distributed and the risks not distributed need to be separately identifiable. Regulators and rating agencies can contribute to this process by working proactively with the insurance industry and by providing capital relief/capital benefit on the basis of well-founded risk capital models as these evolve.

Perhaps the single most important impediment to expanding the investor base for insurance securitization and the variety of risks that are securitized is the insurance industry's ability to describe accurately (albeit stochastically) the nature of the cash flows to be acquired by the investor. As the history of securitization in the banking markets has demonstrated, effective securitization relies upon a precise description of the underlying cash flows, including an accurate description of the variables that may affect the quantum, timing, and certainty of these cash flows and the level of uncertainty in these variables. Robust models necessary to support the capital and risk analysis will also facilitate the presentation of these cash flows to investors and the precise quantification of their stochastic parameters. L&H cash flows are perhaps the best understood currently and are more capable of being modeled at this time than P&C risks. L&H transactions may thus lead the way in the next phase of development.

Bringing these different strands together, the Study Group's main recommendations to encourage the development of the insurance securitization market are as follows:

- **The industry needs to identify, measure, and manage the risks involved in securitization more effectively. This involves:**
  - better identification of the risk transfers involved
  - the development of closer linkages between reinsurance risk and capital markets risk
  - improved modeling of the probability of loss associated with particular risks, the breakdown of cash flows, risks, and capital, and the significance of basis risk.

- **The industry needs to move toward greater standardization of securitization transactions, covering:**
  - the use of SPVs
    the characteristics of insurance-linked instruments
  - the use of synthetic triggers and indexes for risks
  - documentation.

- **The industry needs to ensure, through appropriate capital markets pricing, that buyers are able to compare accurately the costs of capital markets transactions with the price of comparable reinsurance cover.**

- **Insurance regulators need to clarify their regulatory treatment of insurance securitization. In particular, they should consider:**
  - taking appropriate account of the transfer of risk effected by a securitization transaction in their calculation of regulatory capital (this should be facilitated by better identification of the risk transfer by the industry)
  - more explicitly recognizing insurance securitization as a valid risk management and balance sheet tool
  - accepting properly constituted SPVs as counterparties able to provide capital relief

- ensuring that the solvency margin applicable to SPVs takes into account the collateralized nature of the cover
- relaxing the limitations on investments in insurance-linked securities by institutional investors.

- **Rating agencies also need to provide greater clarity in their approach to insurance securitization. This should involve:**
  - the provision of guidance on how a capital markets transaction is likely to affect the rating of the issuer
  - the treatment of the securitization in assessing operating leverage
  - the development of more standardized methods for quantifying the risks involved in securitizations.

- **All the interested parties, including bankers, lawyers, regulators, and rating agencies, need to pool their expertise and cooperate whenever technical barriers to securitization in general or issues in particular occur, including:**
  - legal risk
  - lack of necessary disclosure
  - lack of data to model cash flows
  - lack of appropriate indexes
  - substantial transactions costs.

5. PUBLIC DISCLOSURE IN THE REINSURANCE INDUSTRY

INTRODUCTION

Public disclosure of financial information by firms — to investors, counterparties, and the public at large — is essential for the efficient functioning of markets. Disclosure can take different forms, including statutory accounts, which provide a picture of the financial position of a company at a specific point in time, and risk management disclosure, which seeks to represent uncertainties about the prospective future position.

Risk disclosure is currently a particularly important issue for the reinsurance industry in the face of concerns about the industry's lack of transparency, which has made it difficult for third parties to assess the risks the industry is taking and the risk management models and methods it is using. Additionally, efforts by the industry to develop the securitization of insurance risk, bringing new risks and novel instruments to the capital market, have put an even greater premium on effective disclosure.

At present, information published by reinsurers and the disclosure requirements they operate under vary significantly across firms and jurisdictions in terms of frequency, detail, and scope. More information on reinsurer disclosure requirements is provided in Appendix V of the first *Global Reinsurance Market Report* produced by the IAIS's Reinsurance Transparency Group, which contains a summary of regulatory reporting, the current level of disclosure, and the disclosure requirements of participating reinsurance jurisdictions.[1] While some listed reinsurance companies publish financial statements on a semi-annual or even quarterly basis, and give additional information to investors through analysts' conferences and similar briefings, public disclosure about reinsurers' risk profiles and approaches to risk management is generally limited.

Despite the variety, it is possible to identify some critical components of disclosure, rooted in the basic economic principles of risk management. However, this economic view and the risk disclosures that arise from it differ in many ways from the regulatory, rating, or accounting views of the world.

In the *regulatory or rating view,* premium income is often used as a proxy for risk assumed. But since premium income reflects not only quantum of risk but price per unit of risk, an increase in premium income does not necessarily indicate an increase in the quantum of risk assumed. This is a particularly important qualification, given the fluctuations in reinsurance underwriting capacity — characterized by slackening and tightening of the market — and associated pricing cycles. In purely mechanistic terms, renewal of the same contract with the same terms and conditions at a higher or lower market rate will change the rating or regulatory view of the risk taken without any change in the true economic risk. For this reason among others, rating agencies rely heavily on supplementary information to assess the financial position of reinsurance companies.

In the *accounting view,* the main focus is on clarity as to how the figures in financial statements are constructed. A high degree of objectivity in the measurement of assets and liabilities is a requirement, al-

1 IAIS (2004), *Global Reinsurance Market Report 2003,* December. Available at: www.iaisweb.org/050303_Global_reinsurance_market_report.pdf.

though this can sometimes conflict with the objective of providing users with the most helpful information. At the moment, accounting standards are in transition from measurement based on acquisition cost, which is objective and precise but often unrealistic, to measurement at market prices or fair values. Given this, there is clearly scope for some inconsistency and a risk that accounts do not reliably reflect economic reality.

Ensuring appropriate public risk disclosure by reinsurers has been an area of official concern for some time. A number of initiatives have been launched, such as those by the IAIS, the International Accounting Standards Board (IASB), and the Joint Forum. These are summarized in Appendix 6. Significant progress has been made in particular by the IAIS, which has developed three standards relating to public disclosure requirements for insurers and reinsurers. The IAIS's Reinsurance Transparency Group (RTG) is also working to raise the level and quality of transparency in the global reinsurance market by developing a framework for collecting, processing, and publishing aggregate global reinsurance market statistics.[2] This framework and the data it has yielded are very welcome, providing the most up-to-date picture thus far available of five key areas: the size and structure of the global reinsurance market; the structure and profile of reinsurance risk assumed; the reinsurance industry's involvement in derivative financial instruments and credit risk transfer activity; its counterparty risk and linkages to other sectors; and the industry's investment, profitability, and capital adequacy. The RTG issued the first Global Reinsurance Market Report in December 2004, based on global reinsurance market statistics for the financial year 2003. It published a second report, with 2004 data, in December 2005.

As the IAIS recognizes, however, a number of caveats apply to these data: the information is collected on a legal entity rather than group basis; it is aggregated, even though different accounting conventions are used in different countries; and it does not provide information on individual firms. In what follows, the focus is on disclosure by individual companies rather than on aggregate statistics.

PRINCIPLES FOR RISK DISCLOSURE

Recognizing the limitations of current accounting frameworks and taking into account official concern that better reporting is needed, this chapter identifies certain principles for the enhanced disclosure of risks by individual reinsurers. These risks are the key ones modeled by individual reinsurers (see Appendix 5 for an overview of the integrated risk models in use at the major firms). The principles are aimed at public risk disclosure and are not intended to cover the accounting rules that apply to financial statements or regulatory disclosure. They are:

- Risk management and evaluation of the risk profile of assets and liabilities should reflect economic reality, as closely as possible.
- Evaluation of assets and liabilities should be carried out on an integrated basis when assessing the impact of risk factors on a firm's available and required economic capital.
- Risks should be assessed on an aggregated basis, taking into account the relationships (correlations) between them, as opposed to assessing each risk on a stand-alone basis.
- Consistent risk measurement methods and assumptions should be used over time to facilitate trend identification and analysis. Where major changes in risk measurement methods and assumptions are made, the nature and effects of such changes should be disclosed.

Based on these principles, a "good practice" approach to risk disclosure is developed and discussed below. This forms the basis of the Study Group's proposals for a new transparency regime, which it regards as an important complement to the existing initiatives. Support for these proposals from the official sector would make their adoption by reinsurance companies much more likely.

The description of good practice can support the discussion about enhanced risk disclosure in two ways. First, it offers some ideas about what future minimum requirements for enhanced risk disclosure might look

2 See IAIS (2004), *Enhancing Transparency and Disclosure in the Reinsurance Sector.* See also IAIS (2004 and 2005), *Global Reinsurance Market Report 2003* and *Global Reinsurance Market Report 2004.*

BOX 7. GROUP-LEVEL AND LEGAL ENTITY-LEVEL DISCLOSURE

Given that the value proposition of the reinsurance industry relies on cross-sectoral and regional diversification of risk, the internal risk models used by major reinsurers to manage their business naturally take a group-level perspective. Disclosures drawing on the risk management process should therefore be based on the group level as well. Group-level reporting and disclosures help users to understand the aggregate risks being assumed and risk management being applied to the group as a whole. A stand-alone disclosure and assessment of the risks of a legal entity within a reinsurance group may lead to misinterpretations.

For equity and debt investors, the principal source of payment is usually the holding company. Therefore analysis will rightly focus on the group's consolidated position as the source of earnings/repayment for these parties. However, cedents are usually in a somewhat different position. Many large global reinsurers still possess numerous separate legal entities that underwrite risks. Although policies may be generated through a centralized issuance mechanism, the "paper" on which the policy is written is therefore often that of the local legal entity. Consequently, in the event that a legal entity is not supported by the rest of the group through the parent, the policyholder or cedent is reliant on satisfaction of its claim from the discrete pool of capital at the local entity level. Also, because of regulatory or legal requirements seeking to maximize the pot of capital available for local cedents, capital and liquidity are not always fully fungible across entities. It is therefore important that the policyholder is cognizant of the financial strength of the local subsidiary.

To take into account the varying levels of commitment a group has to its subsidiaries, the approach of one of the leading credit rating agencies, Standard & Poor's, includes undertaking both a top-down (consolidated) approach and bottom-up approach (conducting separate reviews of each subsidiary). The process comprises three stages:

1. Undertaking a consolidated group analysis to allow notional group ratings to be confidentially assigned across the entire group as though it were a single corporate entity.
2. Establishing confidential stand-alone ratings for each individually rated entity within the group.
3. Completing the analysis by designating each rated entity within the group as either core, strategically important, or non-strategic to the ultimate parent group and adjusting the final public rating accordingly to reflect the appropriate level of group support.

To enable users to assess the financial strength of a certain legal entity, and where local law and regulation impose requirements or restrictions that may limit fungibility of capital across the group, reinsurers could usefully provide the following disclosure:

- A description of the entities covered in the group disclosure
- The public credit/financial strength ratings that apply to all group subsidiaries
- A statement indicating whether subsidiaries are complying with regulatory requirements, and disclosure of any non-compliance
- A description of how group-level risk management addresses potential limitations on the fungibility of capital across the group.

like. Second, it gives some indication about how risk disclosure might develop in the medium term. Given the current state of play and the lack of common standards, the emergence of good or best practice will be an evolutionary process, for which the proposed disclosure framework can only be a starting point.

A number of key considerations have been borne in mind in devising the risk disclosure framework, including the need to maintain competitive efficiency and therefore avoid any recommendation that significant proprietary information should be publicly disclosed. Other important issues are the extent to

which standardization of approaches can be achieved, and the balance between group and legal entity risk disclosure. The latter is discussed in Box 7.

Standardization of risk disclosure would facilitate comparisons across firms. While standardization may already have been achieved in some instances or may be achievable over time in others, in some areas it may be challenging or impracticable to attain. Standardization may come about over time by using standard categories to classify assets and liabilities and applying the same measures of risk, such as one-year 99% VaR. In the area of stress testing, some common stress scenarios might also be designed and applied to analyze and compare outcomes, although consideration must be given to the risk profile of each firm. These might include capital market scenarios, some natural catastrophe scenarios (such as the five highest-impact events for the reinsurer, measured in terms of the "1-in-100-year event" loss), and possibly a life scenario (such as a measure based on the percentage of life insurance in force or the impact of an additional 100,000 deaths in the main countries in which the reinsurer has exposures).

Stress test information is most relevant when the stress scenario reflects the particular portfolio of risks to which a reinsurer is exposed. Given this group/company specificity, guidance on the choice of relevant stress scenarios and the manner in which their impact is described should be principles-based, not standardized.

COST/BENEFIT ANALYSIS OF THE RISK DISCLOSURE FRAMEWORK

Financial firms generally, their counterparties, and regulators have recognized the benefits of enhanced public disclosure of risk information as a critical supplement to accounting-based information. Willingness to provide information about specific and aggregate risk exposures and risk management approaches enhances the confidence of the "consumers" of information. Such disclosure should also benefit firms through reductions in risk premiums, if the volatility of their results over time is shown to fall within the range of outcomes suggested by their risk disclosure.

Since public disclosure of risk information is very uneven throughout the reinsurance industry, the good practice disclosures set out in the proposed framework should lead the way to improved standards across the industry as a whole. Enhanced risk disclosure will help users understand how reinsurance businesses are run and managed; enable financial markets to make better-informed judgments and thereby exert market discipline more effectively; and as a result ensure more efficient allocation of capital.

Risk disclosure may well involve some additional costs, effort, and time. In particular, additional costs could arise if various initiatives already implemented or underway to enhance reinsurance transparency lead to inconsistent reporting requirements. This underscores the importance of coordination or harmonization across relevant initiatives. If that is achieved, the additional cost arising from the implementation of this report's recommendations is likely to be low, because the recommended disclosures are consistent with and draw on firms' current business risk management practices.

STRUCTURE OF THE PROPOSED DISCLOSURE FRAMEWORK

The risk disclosure framework proposed in this chapter begins with the identification, in each of a number of areas, of a key issue that enhanced risk disclosure should help to address. This is followed by a description of current good practice and, where appropriate, descriptions of other possible disclosure regimes that would meet good practice principles and guidance on practical enhancements that could be implemented for the entire industry. The areas covered in the proposed framework are:

- Governance and risk management
- Risk factors
- Quality of risk management
- Quality of risk models
- Stress testing
- Financial risk exposures and non-insurance/reinsurance activities
- Availability and quality of capital in relation to risk exposure.

BOX 8. SARBANES-OXLEY AND INSURANCE INDUSTRY DISCLOSURE

The Sarbanes-Oxley legislation in the United States has placed financial reporting by all U.S. publicly traded companies on a much sounder footing, because it has strengthened accounting controls and increased investment in infrastructure (both staffing and systems) designed to ensure that each company produces better quality data. It has also caused companies to take more responsibility themselves for accounting decisions and to rely less on their auditors (notwithstanding the increased level of outside auditor scrutiny).

Sarbanes-Oxley has therefore changed the landscape for public reporting, including by reinsurers. The requirement for the CEO and CFO to attest to the accuracy of financial statements is creating a new dynamic for reinsurers' public reporting. Sarbanes-Oxley should bring many benefits to the insurance industry, with buyers of insurance likely to become increasingly aware of the risks they are running. Risk disclosure by both sellers and buyers of insurance should become more complete and their risk management better coordinated. Better disclosure should improve the ability of reinsurers and insurers to manage their own inward risks.

The legislation has also brought about greater internal scrutiny of business processes and data flows within the insurance industry. Key accounting estimates are likely to be better supported and more transparent. And inefficient financial processes are more likely to be eliminated — if compliance is carried out properly, insurance company management should receive timely and accurate financial information, fostering more informed decision-making. For example, timelier reporting of accumulated property risks may induce an insurer to purchase catastrophe reinsurance protection, or ensure that such risk is within management's tolerance for that exposure. The result is likely to be a more tailored program, better cost control, and, for the better-run companies, a long-term competitive advantage. Conversely, insurers and reinsurers that report material weaknesses in their internal controls over financial reporting may suffer adverse ratings reviews, damage to their reputation, and a loss of market share.

Some additional detail on recommended disclosures relating to risk factors, quality of risk models, and the availability and quality of capital in relation to risk exposure is provided in the Annex to this chapter — Notes to the Principles.

GOVERNANCE AND RISK MANAGEMENT

Many company failures have their roots in failed governance processes. To enhance confidence, it is therefore important to provide stakeholders with a description of the governance processes to which a company adheres. The adoption of the Sarbanes-Oxley legislation in the United States has highlighted the importance of disclosure in this area (see Box 8).

Corporate governance describes the framework of rules, relationships, systems, and processes within and by which authority is exercised and controlled in corporations. Understood in this way, the term "corporate governance" embraces not only the frameworks or systems themselves but also the practices by which the exercise and control of authority is given effect. Risk governance addresses those aspects of corporate governance that are relevant from a risk management perspective. Three main pillars of sound risk governance can be identified, involving the establishment of:

a) the risk tolerance that is appropriate to achieve the strategic objectives of the organization
b) the processes by which the risk tolerance is delegated to management
c) the processes for monitoring actual risk assumed against risk tolerance and actioning steps when actual risk exceeds or is in danger of exceeding the established risk tolerance.

There is no single "template" for sound risk governance practices and structures. The approach must be tailor-made to reflect the particular legal and

regulatory environment(s) in which a group operates and the extent to which a centralized/decentralized business model is adopted. The quality or strength of a group's risk governance structures and processes depends importantly on the extent to which there is consistency across the business functions and geographical locations in the design and application of the major risk governance processes for each of the major categories of risks.

RISK FACTORS[4]

Reinsurers hold capital as a buffer against the risks they underwrite. As such they need to be able to provide information relating to: the main risk factors that may have an impact on capital; the main concentrations of risks to which they are exposed; their level of confidence that available capital is sufficient to meet their obligations; and how the risks they are exposed to have changed over time.

A clear first step toward providing this information is the identification of the main risk factors to which the reinsurer is exposed. The impact of risk factors should be measured on an economic basis and the disclosure should include the impact on both assets and liabilities. As noted earlier, to facilitate comparability across groups, it would be desirable that a common classification of risk factors be used across the industry. A sensible basis would seem to be the classification set out in the *Report of the Multidisciplinary Working Group on Enhanced Disclosure* (the "Fisher II report"),[5] extending it to allow for greater detail on those risk factors that are material for and unique to the reinsurance industry, as follows:

- Market risk, credit risk, P&C risk, and L&H risk, all of which should be disclosed in a quantitative form
- Funding/liquidity risk and operational risk, which may be quantified.

Where quantitative information is available, disclosure should address two main aspects: exposures to the main risk factors and risk measurement at the overall portfolio level. This includes disclosing the extent to which diversification benefits are recognized and providing information about risk accumulation/concentration within the portfolio.

QUALITY OF RISK MANAGEMENT

It is not only necessary for users of disclosed information to know that a reinsurer has a risk management process, but also that the process is effective in practice. Risk disclosure should enable users to form a judgment on the effectiveness of the process used.

Any attempt to assess the quality of risk management is inherently difficult given that the risk management function is predominantly preemptive in nature. Assessing the effectiveness of risk management would require an assessment of the extent to which the reinsurer's risk management helps it avoid underwriting mistakes. Some reinsurers might also want to measure the extent to which they succeed in maximizing the risk-adjusted returns on capital or in reducing the volatility of returns over a period of time.

In principle, it is possible to assess the quality of a reinsurer's risk management practices by focusing on a number of key qualitative risk disclosures. These include:

- the risk management process in place
- the approach to asset and liability management (ALM)
- the risk models in place
- the relevant outcomes for significant events relative to the assumed risk.

The first factor relates largely to the reinsurer's corporate governance process, including its underwriting strategy and procedures, the controls in place to limit risk accumulation/concentration, and the personnel responsible for deciding on and monitoring risk limits.

For the second factor, a proper process should ensure that the strategic allocation of assets takes account of the characteristics of liabilities. This includes consideration of the interdependencies between asset and liability cash flows as well as liquidity require-

4 Further details on recommended disclosure in the area of risk factors are provided in the Annex to this chapter.
5 Published by the BIS on April 26, 2001. Available at: www.bis.org/publ/joint01.pdf.

ments. The required understanding of ALM goes much further in reinsurance than is common in the banking world.

For the most part, liquidity risk is less important for reinsurance companies than for banks because of the generally non-callable nature of reinsurers' liabilities and the time lag — often more than a year — between claims and payments. As noted in Chapter 3, this reduces the risk that reinsurance companies will become susceptible to bank-style runs. Sudden liquidity requirements may, however, arise if covenants are triggered under specific adverse developments, requiring for example the collateralization of liabilities or provision of third party guarantees, or leading to the cancellation of contracts and demand for repayment of premiums paid. It might therefore be appropriate for reinsurance companies to provide disclosure of their liquidity risk and the instruments used (such as the extent of reliance on banking facilities, capital markets instruments, and their size) and possibly also disclosure of liquidity ratios relevant to the specific circumstances of the company or group.

The third and fourth factors are discussed in more detail in the next section.

QUALITY OF RISK MODELS[6]

Internal risk models form the basis for steering the business of most reinsurance groups. The recipients of risk information need a means to assess the quality of the information provided and in particular the quality of the risk models on which this information is based.

Reinsurers have an interest in assuring themselves about the quality of the models they use to price risks and thus ensure appropriate returns. To obtain such assurance, reinsurers typically use experts from various fields (actuaries, geoscientists, engineers, physicians, economists, bioscientists, and lawyers) and also engage external consultants to provide independent evaluations. In general, expert judgment is always an important element in models used to determine capital adequacy. This is particularly true for the development and building of models used for evaluating insurance risks of a low-frequency/high-impact nature, which usually require a multi-disciplinary approach.[7] Decisions to effect major changes in an existing model or to switch from one model to another are often discussed or reviewed with/by external consultants, auditors, and other experts. In the recent past, major reinsurers have provided disclosures about the engagement of external consultants to perform evaluations of their risk management processes.

It would therefore seem desirable for reinsurers to have their models reviewed and benchmarked by an independent party[8] and to provide disclosures about whether the models have been "certified" as reasonable in such a process of external review. Such an evaluation may follow the principles outlined/proposed by the Australian Prudential Regulation Authority (APRA), the European Union (EU) Solvency II Subcommittee, and the UK Financial Services Authority (FSA)'s consultation paper 190 (CP 190) regarding the use of internal models. These are listed in the Annex to this chapter.

Key features of company-specific internal risk models (for example, as discussed currently under Solvency II) could in addition be inspected by the lead supervisor[9] in the home state of a reinsurance group. Properly developed as a regulatory approach, this could help bring about increased confidence in the risk models used by the reinsurance industry. As well as the robustness of risk models, the quality and integrity of the processes and data used to feed into the models are just as important. Reinsurers should therefore make appropriate disclosures about the way they seek assurance on these points.

A common method of measuring the quality of statistical models is back-testing: that is, essentially comparing actual outcomes with model predictions. In general, back-testing makes sense only for those regions of a distribution for which a statistically

6 Further details on recommended disclosure in the area of the quality of risk models are provided in the Annex to this chapter.

7 The assumptions on which such models are based are being reviewed, following the hurricanes in 2005, in the light of the apparent increase in the frequency and severity of hurricanes.

8 The CRO Forum is developing minimum standards that could be useful for the public disclosure of the outcome of model evaluations.

9 The lead supervisor may do this itself or require that an independent third party certify to it that minimum standards have been observed, which could give the supervisor comfort in the efficacy of the model and the firm's control environment.

relevant number of observations can be collected. An area where back-testing is very relevant is in models measuring risk over a very brief time horizon, such as one day, and where high-frequency data are available to perform the back-testing. (In the context of banks, this is predominantly the case for their trading book, but not for their banking book.)

This practice is in marked contrast to the use of models for determining capital adequacy over a longer time horizon, such as one year. In this case, models are used in the tail region of the distribution, where by definition not many statistically relevant observations exist to validate the model. For example, what would it mean to back-test models for events such as earthquakes or storms with a recurrence period of 100, 200, or more years? The same issues of course arise for financial market models in relation to very infrequent events. As mentioned above, expert judgment plays a critical part in the way risk models are used; and reinsurers view their expertise in assessing risks as a major component of their individual competitive advantage. They are therefore likely to be reluctant to disclose too much detail about their models. This should not prevent them, however, from disclosing information on their risk measurement framework, such as the basic approach to assessing rare threats.

The outcomes of significant events relative to the ex ante estimate of the appropriate capital cover (measured on a stand-alone basis) may provide useful information on the overall robustness of a reinsurer's risk management tools and processes. For example, disclosure of the extent to which a catastrophic event during the measurement period "burned through", was in line with, or was well within the estimated capital requirement could provide an indication of the appropriateness of the limits in place, the robustness of the reinsurer's modelling tools, and the allowance made for risk accumulation across lines of business — all indicators of the quality of a reinsurer's overall risk management process. It may also be useful for reinsurers to provide information on actual reserve developments for known problematic cases such as asbestos. However, the extent to which these can be considered a reasonable indicator of the quality of risk management is open to question because these developments may reflect highly specific factors (such as changes in legislation or regulations relating to liability law, changes in the judicial system, or changes in the legal environment).

STRESS TESTING

Required capital calculated on the basis of a stochastic model is capable of capturing all relevant effects, including accumulation and diversification, but does not provide a concrete or intuitive idea of the type of scenarios that a reinsurance group can (or cannot) withstand. As a complement to stochastic models, stress tests consider the impact of specific stress scenarios (severe events or combinations of events). Provided they take into account the impact on both sides of the balance sheet and show the overall result, stress tests can reveal the exposure of a company to severe events and serve as a plausibility check for the results generated by stochastic models. Where capital requirements are based on stochastic models that already allow for such scenarios, there should be no additional capital requirements derived from specific stress scenarios.

As suggested earlier in this chapter, the design of stress scenarios should generally be based on the specific risk profile of the reinsurance company. A scenario that is meaningful for one company may be largely irrelevant for another. As with risk modelling, defining and evaluating stress tests for liabilities often requires the use of multidisciplinary experts, because "the stress" may involve several interrelated events occurring simultaneously or a single event may have an effect on multiple lines of business. For example, an airplane crash over a big city can affect simultaneously aviation, liability, life, business interruption, and pollution business. Since the design of stress scenarios needs to be company/group-specific, full standardization of disclosure cannot be expected in this area. The definition of some standard scenarios could be considered, such as the top five natural catastrophe scenarios for the reinsurer.

The overall impact of stress scenarios on assets and liabilities within the internal risk modelling should be provided on an economic basis. This is important, given that a stressed interest rate environment, for example, has an impact on both the bond portfolio and the present value of liabilities.

The disclosure of stress test information is far more common for assets (equity and/or bond market crashes)

than for liabilities. This is in part driven by accounting conventions, whereby in many cases non-life reinsurance liabilities are currently disclosed at their nominal or undiscounted values. Risk-based disclosures should therefore focus on the extent to which the stress scenario (and available risk mitigation measures) have an economic impact on both sides of the balance sheet.

Reinsurers should in any event disclose whether they perform stress tests in addition to using stochastic risk models. Here it might be useful for reinsurers to disclose key features, which might include, for example, the top five stress scenarios they test against. The results of the stress scenarios could provide valuable additional information for users to assess the financial capacity of reinsurers to withstand severe events. They should also disclose the extent to which they are able to mitigate the loss through prearranged risk mitigation instruments or actions (such as interest rate or currency hedges, traditional retrocession or insurance-linked securitization, and reliance on contractual relief, for example in the event of war).

FINANCIAL RISK EXPOSURES AND NON-INSURANCE/REINSURANCE ACTIVITIES

The majority of a reinsurer's assets are subject to financial market risks. In addition some reinsurers take on activities that are unrelated to their core insurance/reinsurance business and are thus subject to other risks.

Reinsurers' exposure to financial market risks on the assets side of their balance sheets can be partly offset by the financial risk sensitivity of their liabilities. This should be taken into account in any scheme of risk disclosure, and measurement should be on an integrated or ALM basis. For instance, an interest rate movement affects both the values of a bond portfolio on the asset side and the economic present value of liabilities. In terms of risk categorization, as explained in the section on risk factors, to facilitate medium-term comparisons it is suggested that reinsurers adopt the categories recommended in the Fisher II report.

Some reinsurance groups make disclosures of credit and market risks based on accounting figures. However, this does not provide economic risk information. An improvement would be for reinsurers to disclose at least exposure information on market and credit risks or, if they can, disclose the respective stand-alone VaR figures over time, along with outcomes.

With regard to foreign exchange exposure, it is recommended that reinsurers disclose their general policy and their practices about whether they run currency mismatch positions, and if so, to what extent. This recommended disclosure goes beyond current disclosure practices by banks, because they provide risk information mainly on their trading book and not on their banking book, even though the latter often constitutes a more significant part of banks' balance sheets and risk profiles.

Every company should define the scope of its risk disclosures, to allow outside parties to assess whether all risks are captured. If not all activities are captured — for example, if some non-insurance/reinsurance risks are left out — then to help outside parties assess the relevance of these risks compared with the core reinsurance business, reinsurers should disclose risk-based information (such as risk profile, main risks, and risk capital allocated) about their non-insurance/reinsurance activities, if material. The form of the disclosure must be interpreted according to the circumstances of the specific group. The disclosure should also include a statement about the strategic rationale behind those investments (including disclosure about core/non-core character).

AVAILABILITY AND QUALITY OF CAPITAL IN RELATION TO RISK EXPOSURE[10]

The risks to which a reinsurer is exposed need to be put into context by providing information on the financial resources available to the company to support these risks. This includes the amount and quality of available capital.

Given that risk is measured from an economic perspective, this implies that capital should also be measured in the same way. For disclosure purposes, it is important to describe the nature and size of the adjustments that are to be made to published (accounting) equity in order to derive the available economic capital. Examples of specific calculations can be found in the existing disclosures made by leading reinsurers. The explicit derivation is particularly important

10 Further details of recommended disclosure in the area of capital are provided in the Annex to this chapter.

because no standards on the precise adjustments required have yet emerged. Disclosing these adjustments will provide a basis for users to judge the quality of the capital: for example, in terms of the amount of tangible capital available and its fungibility.

A reinsurer's business model relies principally on cross-regional risk diversification. Such a business model requires that economic capital requirements are calculated with a global or group perspective in mind. This means that the capital adequacy and the associated disclosures are more meaningfully assessed taking a global or group perspective as well. More detail on group- and legal entity-level disclosure is provided above in the section on principles for risk disclosure.

Apart from having to maintain capital measured in the economic perspective, reinsurers also must meet capital requirements from the regulatory and rating agency perspectives. For example, in some cases, regulatory and rating agency models apply haircuts to some capital elements, which may not be reflective or consistent with the pure economic value or true fungibility of the capital item. A qualitative discussion of how reinsurers manage the tensions between these constraints and the economic view of available capital would improve risk disclosure.

RECOMMENDATIONS

The disclosure of risk information varies significantly from one reinsurance firm to another. To improve and standardize risk disclosure, the Study Group makes the following recommendations:

- **that a framework for best practice risk disclosure should be adopted, covering the following elements of reinsurers' risk management:**
  - Corporate and risk governance
  - Risk factors
  - The quality of risk management
  - The quality of risk models
  - Stress testing, involving the assessment of worst-case scenarios
  - Financial risk exposures and non-insurance/reinsurance activities
  - Availability and quality of capital.

- **that the industry should launch a working group to build on this framework and take the work further. Possibilities include:**
  - Initially taking the discussion forward through the Geneva Association's Annual Roundtable of Insurance/Reinsurance Chief Risk Officers (ART of CROs)
  - Using the CRO Forum.

- **that government authorities, regulators, and rating agencies should encourage firms to adopt the risk disclosure framework.**

- **that the IAIS should discuss within its working groups whether, for primary insurers, the relief obtained from reinsurance above a certain threshold (which is currently subject to an arbitrary upper limit) should be conditional on the reinsurer meeting the IAIS's own principles and standards and the risk disclosure framework proposed in this report.**

- **that improvements in risk disclosure should be accepted as an evolutionary process and should be consistent with market forces.**

- **that the evolution of disclosure standards should be accompanied by educational efforts to raise the market's understanding of reinsurance business.**

ANNEX: NOTES TO THE PRINCIPLES

RISK FACTORS

For all risk categories, stand-alone 99% VaR — the once-in-a-hundred-year loss — could be used as a basic measure of exposure. On an overall portfolio level, a reinsurance group could disclose the base capital requirement needed to support its underlying risks based on a 99% VaR. However, most reinsurers manage their business using a higher VaR level: for example, two parallel once-in-a-hundred-year events, equating to a >99.97% VaR or AAA/AA. Therefore, disclosure of the group's overall risk tolerance can also be made by expressing this as a multiple of the base capital requirement.

For financial market risk categories, exposure measures could include sensitivities to changes in interest rates, foreign exchange rates, and equity prices. For reinsurance risks, exposure measures could include, for instance, sums insured (which could be a useful indicator in life risk business), estimated maximum losses, and expected event losses for a specified return period: for example, 200-year event losses for peak natural catastrophe risks relevant to the reinsurer's portfolio.

Disclosing 99% VaR for each Fisher II category as well would also permit a reinsurance group to measure and disclose the net diversification effect implied by the model, after allowing for risk accumulations/concentrations across different business lines and after consolidating various legal entities within the group that are captured by an integrated modelling approach.

Some examples of how some of these recommendations might be given effect in practice follow. Tables 4 and 5 show disclosures according to the Fisher II risk categories by two major reinsurance groups — Swiss Re and Munich Re — and their risk capital requirement calculation based on 99% VaR (Swiss Re) and the ability to withstand two consecutive one-in-a-hundred-year losses (Munich Re).

TABLE 4. EXTRACT FROM SWISS RE RISK DISCLOSURE

Swiss Re Group 99% VaR capital requirement calculation

CHF billions	30.06.2004	31.12.2004	% change
Property and casualty	5.5	4.9	-11
Life and health	1.7	1.7	0
Financial market	4.9	4.3	-12
Credit	1.7	1.6	-6
Funding and liquidity[a]	0.7	0.3	-57
Simple Sum	14.5	12.8	
Diversification effect[b]	4.3	3.9	
Swiss Re Group	10.2	8.9	-13

a. The reductions in funding and liquidity risk mainly reflect the improvement in Swiss Re's financial strength, which had reduced the likelihood that the collateral covenants are triggered to less than 1%.

b. The size of the diversification effect calculated by subtracting the Group capital requirement from the simple sum depends critically on the risk measure and on the number of risk categories considered. Fewer risk categories would result in a smaller measured diversification effect and vice versa.

Source: Swiss Re Group

QUALITY OF RISK MODELS

The principles suggested for independent evaluation of the quality of risk models are those outlined by APRA, the EU Solvency II Subcommittee, and the FSA's consultation paper 190 (CP 190). They can be summarized as follows:

APRA Requirements

Qualitative

- Operated in independent risk management unit
- Adequately resourced
- Integrated with risk management practices
- Periodic independent reviews and audits

Quantitative

- One-year probability of default less than 50 bps (BBB) or equivalent
- Representation of all major risk types
- Correlations and stress scenarios

TABLE 5. EXTRACT FROM MUNICH RE RISK DISCLOSURE

Breakdown of Group required risk capital as at 1 January 2005

in €bn	1 January 2005		1 January 2004		▲ in %
Risk category[a]	Stand-alone	Group	Stand-alone	Group	
Reinsurance segment					
Property-casualty	5.9		6.6		-10.6
Life and health	2.2		1.7		29.4
Market	8.6		11.5		-25.2
Credit	0.6		0.7		-14.3
-->Simple sum		17.3		20.5	-15.6
-->Segment diversification effect[b]		-6.2		-6.0	3.3
Total reinsurance segment		**11.1**		**14.5**	**-23.4**
Primary insurance segment					
Property-casualty	0.6		0.5		20.0
Life and health	0.4		0.4		-
Market	2.0		1.8		11.1
Credit	0.3		0.3		-
-->Simple sum		3.3		3.0	10.0
-->Segment diversification effect[b]		0.0		0.0	-
Total primary insurance segment		**3.3**		**3.0**	**10.0**
Munich Re Group total		**14.4**		**17.5**	**-17.7**

a. Risk categories broadly based on refined "Fisher II" risk categories recommended for standardized industry disclosures. Munich Re Group includes an allowance for operational risk in each of the risk categories.

b. The measured diversification effect depends on the number of risk categories considered. Represents diversification effect recognized in internal model —— diversification effects between legal entities within primary segment and between primary and reinsurance segment are recognized.

Soucrce: The Munich Re Group

EU Solvency II Subcommittee

- APRA requirements, plus
- Process to check quality of data, plus
- Linkage to accounting view of risk.

FSA CP 190 Principles

- Use of internal models viewed as part of "good risk management practices" and encouraged
- Must be integrated with all other risk management practices
- Independent reviews required.

AVAILABILITY AND QUALITY OF CAPITAL IN RELATION TO RISK EXPOSURE

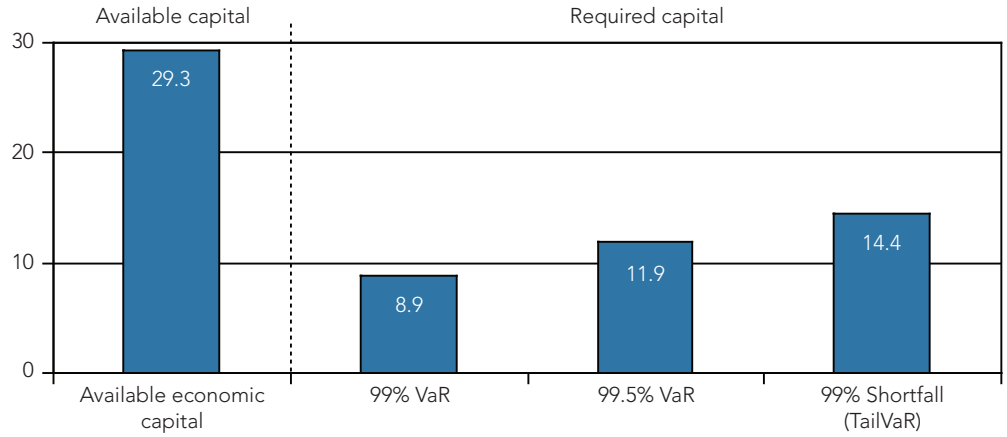
Some examples of how some of the recommendations under this heading might be implemented in practice follow. Table 6, drawn up by Swiss Re, shows its capital adequacy under various confidence levels, thus providing a fuller assessment of the weight of the group's tail distribution compared with a normal distribution.

Tables 7 and 8, prepared by Munich Re, reveal its available financial resources and internal estimate of required risk capital, and the group's economic capital buffer relative to capital requirements.

TABLE 6. SWISS RE'S CAPITAL ADEQUACY UNDER DIFFERENT ASSUMPTIONS

Capital adequacy: Internal view (per 31.12.2004)

(CHF billion)



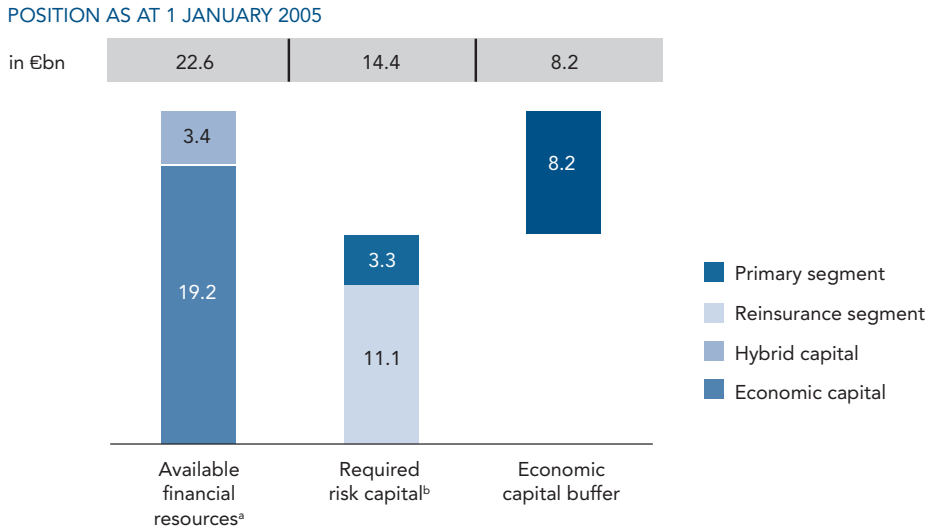
- CHF 8.9bn represents the difference between the expected result and an adverse result with a frequency of once in 100 years
- CHF 11.9bn broadly reflects BBB capital requirements (once in 200 years)
- Ratio of available economic capital to 99% VaR=329%; ratio of available economic capital to 99.5% VaR=246%

Source: Swiss Re Group

TABLE 7. MUNICH RE'S FINANCIAL RESOURCES AND CAPITAL REQUIREMENT

Available financial resources and required risk capital

Summary of economic capital disclosure



a. Sum of economic capital and hybrid capital

b. Based on requirements of internal risk model, calibrated to withstand two 1 in 100 year losses; equivalent to an economic probability of default in the AA to AAA range.

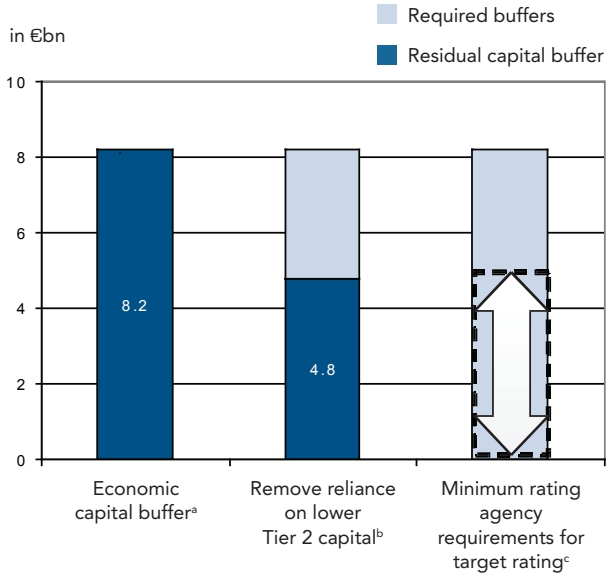
Source: Munich Re Group

TABLE 8. MUNICH RE'S ECONOMIC CAPITAL BUFFER

Available financial resources and required risk capital

Regulatory and rating agency target capital requirements: Important constraints

POSITION AS AT 1 JANUARY 2005



a. Excess of available financial resources over required risk capital on internal model
b. Base-case economic capital buffer less hybrid equity which qualifies as lower Tier 2 capital under some regulatory regimes (and hence subject to solvency capital admissibility constraints)
c. Represents overall effect of difference between internal model and rating-agency measures of capital adequacy for target rating (AA range)
The arrow represents differences in approaches between the various rating agencies – Some of these can only be assessed qualitatively

Source: Munich Re Group

6. SUPERVISION AND REGULATION OF REINSURANCE FIRMS

INTRODUCTION

One result of the developments outlined in previous chapters of this report is that there has been increased focus on the regulatory arrangements applying to reinsurance companies.

It is perhaps worth recalling the basic rationale for regulatory intervention, in the financial sector and more generally. It is essentially the existence of market failures — but importantly it is also a judgment that the policy instruments available to the regulator are capable of addressing the market failures without introducing equal or greater distortions. Two sorts of market failures have typically prompted regulatory intervention in the financial sector. The first relates to the systemic impact of a firm's actual or prospective insolvency: that is the impact through "contagion" on the population of firms generally, which may not be taken into account adequately by the owners and management of any individual firm. The second relates to asymmetry of information: that is, a disparity in knowledge and expertise as between the supplier and consumer of financial services.

In the case of reinsurance, the disparity-of-expertise argument has limited force, given that the main interaction of reinsurers is with other reinsurers or with insurance professionals in the primary sector. In principle at least, these parties should be well able to take care of themselves, so any rationale for regulation based on protecting unsophisticated consumers of financial services against loss of their funds falls away in the reinsurance case. So far as systemic risk is concerned, the arguments are less clear-cut and the issue of the potential systemic effect of a reinsurer's failure has been much debated. It is easy to see how knock-on effects could arise within the insurance sector; it is less clear how serious the wider impact within the financial sector might be. The analysis in Chapter 3 suggests that this wider impact is likely to be limited. Given these conclusions, some have questioned whether there are strong arguments for regulating reinsurance at all.

Perhaps because of this uncertainty, the current approach to the regulation of reinsurers is somewhat heterogeneous. In some countries, reinsurance is regulated in the same way as primary insurance; in others, it is hardly regulated at all. In the former group, reinsurers tend to be regarded as uniquely important counterparties to primary companies, providing them with additional risk-taking capacity and, in doing so, playing a critical role in their viability. In the latter group, the "sophisticated buyer" rationale has been used not only to justify an absence of consumer protection regulation, but also of prudential supervision — the management of primary insurers was viewed as having sufficient expertise to evaluate adequately the financial strength of reinsurance counterparties.

The Study Group extensively discussed the arguments for applying to reinsurance the kind of regulatory framework that is now commonplace in the banking and securities sectors. There were different shades of opinion on the issue, but the clear view overall was that the substantial and growing role of the major reinsurance companies indicated the need for a better articulated and more consistent approach to the regulation of reinsurance business. Specifically, this was felt to be required for three reasons. First, even though the analysis in Chapter 3 clearly indicates that the reinsurance sector is not likely to be a source

of disruption to the financial system as a whole, that does not preclude the possibility that the effects within the insurance sector of a reinsurer's failure could lead to direct economic costs that are not or cannot be adequately internalized by the management of an individual reinsurance company. Second, primary insurers, which are invariably subject to regulation, are typically allowed full offset for reinsured risks (albeit within limits), which implies the need for a high degree of confidence that the reinsurer will be capable of meeting its obligations should they materialize. And third, reinsurance companies have nevertheless become more closely interlinked with the financial sector more generally — although so far on a relatively modest scale — for example, through their participation in markets for new financial instruments.

CURRENT CHALLENGES

Regardless of the arguments for and against reinsurance regulation, the fact is that the major reinsurance jurisdictions all now have regulatory frameworks of one kind or another in place, which are continuing to be developed. The main aspects of and recent developments affecting these frameworks are summarized in Appendix 7. In what follows, we set out principles for assessing the effectiveness and consistency of current supervisory arrangements and suggest ways in which the framework of supervision may be rationalized, consistently with reducing the overall regulatory burden where possible. In considering these matters, it is important to recognize the political environment confronting the reinsurance industry. Our analysis was undertaken against a backdrop of well-publicized scandals involving the insurance, reinsurance, and insurance brokerage businesses. Investigations of questionable reinsurance transactions and structures have focused particularly on "finite reinsurance" transactions, explained in Box 9,[1] which have raised questions about the independence of reinsurers from the ceding insurer and associated accounting practices. These events have also highlighted the role of offshore jurisdictions in the global reinsurance market, touched on in Chapter 2.

Even before these recent cases, however, there was already a substantial groundswell of opinion in favor of revising approaches to the supervision of reinsurance. Notwithstanding the fact that systemic risk — in the sense of widespread contagion — may be difficult to demonstrate, the increasing size and global scope of the operations of the largest reinsurers has increased supervisory concern about the direct impact the collapse of a major reinsurance firm would have on primary insurers, financial markets, and consumers. The world-wide reinsurance industry reported aggregate capital of nearly $380 billion as of December 31, 2004. Premium volumes have increased from about $120 billion in 2000 to nearly $170 billion in 2004. As noted in Chapters 1 and 2, the industry is fairly concentrated, with the ten largest reinsurance groups accounting for more than 60% of the world-wide reinsurance market in terms of net premiums written.[2] In addition, reliance of primary insurance companies on reinsurance has increased such that, for many, reinsurance recoverables represent the largest asset on the balance sheet, and often a reinsurer will represent a primary company's largest exposure to any single counterparty.

Furthermore, supervisors have cause for concern in the recent deterioration of the financial health of several significant reinsurers. From 2001 to 2003, Standard & Poor's downgraded 14 of the 20 largest reinsurer groups. The sixth-largest reinsurer discontinued its operations and several others required significant capital injections from investors and/or their parents. As discussed in Chapter 2, the deterioration was driven by the adverse impact of unfavorable equity markets and low interest rates, combined with the need to make significant additions to reserves.

1 The analysis in Box 9 is based substantially on published material, notably Guy Carpenter (2005), *Finite Reinsurance and Risk Transfer: Will Concern in the United States Shape the Global Debate?,* September; and IAIS (2005), *Guidance Paper on Risk Transfer, Disclosure and Analysis of Finite Reinsurance,* October.

2 The estimates in Chapters 1 and 2 are based on calculations by Swiss Re Economic Research and Consulting. Other estimates show similar or higher degrees of concentration, with the market share of the ten largest reinsurance groups ranging from more than 50% to around 70%.

BOX 9. FINITE REINSURANCE

Finite reinsurance is a generic term used to describe an entire spectrum of reinsurance arrangements that transfer limited risk relative to the aggregate premiums that are charged under the contract. A typical transaction may include provisions for aggregating risk and limits of liability, for aligning the interests of the ceding insurer and reinsurer, and for explicitly recognizing the time value of money. Some finite reinsurance transactions contractualize the long-term relationship between the reinsurer and the cedent, based on the reinsurer's expectation that cedents will over time generate an adequate risk-adjusted return on the reinsurer's capital, which the cedents are effectively using.

A number of finite reinsurance transactions have attracted the attention of insurance regulators. Sanctions have been imposed on the improper use of this form of reinsurance, where transactions have been entered into with the specific aim of misrepresenting financial and regulatory reporting. These investigations have also prompted a wider review of the accounting and regulatory treatment of finite reinsurance, focusing in particular on the precise nature of the risk transfers involved. In this context, a shift to reporting and accounting based on market values would reduce the incentive to enter into finite reinsurance transactions solely in order to overcome the inability to discount reserves and to unlock the profitability of business underwritten.

A key issue concerns the extent to which finite reinsurance qualifies for solvency relief. Most current regulatory regimes define solvency requirements – and indeed solvency relief for reinsurance – in relation to premium volumes and/or claims incurred. Two reinsurance contracts involving the same premium volume will therefore attract the same capital relief for the cedent, even though the risk transfer element may be significantly different. Substantial use of finite reinsurance may therefore give rise to the possibility that a company with insufficient economic capital nevertheless meets its statutory solvency requirement. The move toward a risk-based solvency regime for (re)insurers should improve matters. The decisive issue for risk transfer will then no longer be whether the amount of risk transfer embedded in a given reinsurance contract justifies a certain level of solvency relief, but whether and how a specific reinsurance contract affects solvency risk in the overall context of the risk portfolio of both the cedent and the reinsurer.

Improved accounting and solvency regimes also need to be supported by more and better transparency, if the risk of inappropriate use of finite reinsurance is to be effectively addressed.

Reserve increases by the 20 largest reinsurance groups during the same period totaled more than 68% of their capital reported at year-end 2000.

In addition to these direct prudential concerns, international efforts aimed at strengthening and achieving greater consistency in supervision and bringing about a more level regulatory playing field have themselves become a driver of change. Critical elements of harmonization include capital requirements and reporting and accounting standards. Harmonization has the potential to increase transparency, facilitate a better understanding of risks, and enable comparisons across institutions. Moreover, global harmonization would reduce harmful regulatory arbitrage that enables companies to move their activities to jurisdictions with the lightest regulation. Current progress in the EU toward harmonization of reinsurance regulatory regimes will allow a reinsurer licensed in one EU country to operate without restrictions in the other EU countries. No such harmonization currently exists between supervisory regimes elsewhere, notably between the EU and the United States.

Pressure to strengthen regulatory oversight of reinsurance has also come from international bodies outside the insurance sector, notably the FSF. In 2002, the FSF noted the growing volume of credit risk transfer from banks to insurance companies, particularly through credit derivatives, and the potential spillover effects between the two sectors. Another concern raised by the FSF was the lack of transparency and

alleged opaqueness of the reinsurance industry. The FSF concluded that policymakers should seek to put in place supervisory arrangements designed to bolster the prudential soundness of the reinsurance industry (and also to increase its transparency, see Chapter 5). Reinsurance issues have also attracted greater attention by the OECD, especially in the aftermath of 9/11. The concerns about a potential risk of major disruption in the global reinsurance market and the need to regulate reinsurance have been put on the agenda of the OECD Insurance Committee.[3]

Thus the supervisory framework for insurance and reinsurance firms faces significant challenges, which are bringing about change in many of the jurisdictions that host the largest firms. The next section looks at how regulatory regimes are evolving in the light of these changes.

THE EVOLVING FRAMEWORK FOR REINSURANCE SUPERVISION: KEY TRENDS

The main drivers of change include both the desire for greater confidence in the overall insurance market, to which the integrity of reinsurance firms contributes, and the continuing growth of the reinsurance markets themselves — and particularly the largest participants, whose activities will increasingly impinge more widely on the financial system. The direction of change includes a trend toward more direct oversight of reinsurers, involving greater convergence with the supervisory approach applied to primary insurers; the growing importance of mutual recognition by supervisory authorities; the gradual move away from mandatory collateral requirements; and the growing emphasis on the overall financial strength of reinsurance groups.

THE TREND TOWARD DIRECT SUPERVISION

Until recently, a number of jurisdictions, including France, Germany, and Switzerland, relied primarily on indirect methods of reinsurance supervision. These focus not on the reinsurer itself but on the effect of reinsurance on the risk exposure and capital requirements of primary insurance companies. However, almost all these jurisdictions have now enacted legislation strengthening their supervisory authority over reinsurers and, in so doing, have indicated a preference for at least some level of direct supervision. This shift is based on the view that, given the size of reinsurance recoverables and the critical role these assets play in the viability of primary insurers, direct approaches provide stronger protection for primary companies and ultimately their policyholders. In particular, direct approaches give supervisors the ability to intervene in the affairs of a reinsurer at an early stage and allow them to protect insurers and policyholders proactively before a major financial problem arises, rather than reactively limit cessions to a troubled reinsurer, as might happen under an indirect approach. Furthermore, given the role that reinsurers play in the broader financial markets, direct approaches provide supervisors with access to information on the risks and risk management systems and capabilities of reinsurance companies, thereby contributing to supervisors' ability to effectively monitor and control the impact of reinsurers on financial stability.

THE GROWING IMPORTANCE OF MUTUAL RECOGNITION

A companion issue to the question of the effectiveness of supervision is the extent of mutual recognition by supervisory authorities. This concept is a fundamental underpinning of EU Directives, including the Reinsurance Directive. Mutual recognition under the latter Directive provides that the home member-state of a reinsurance group is responsible for the supervision of the group's activities in all other member-states. In broad terms, all the relevant supervisors in host member-states recognize the regulatory authority of the reinsurance supervisor in the home member-state.

Mutual recognition has a number of efficiency benefits, including elimination of duplicative regulation. Allowing reinsurers a single passport to operate worldwide would be consistent with the global value proposition and might result in greater reinsurance capacity and competition. Given, however, the disparate levels of supervisory oversight, different accounting and legal systems, and the supervisors' different statutory responsibilities in different countries, mutual

3 OECD (2005), *Trends in Reinsurance Markets and Regulation in OECD Countries* (DAFFE/AS/WD(2004)5.

recognition among all jurisdictions is likely to require significant effort and some time before it is a real possibility. The passage of the EU Reinsurance Directive is helpful in this regard, inasmuch as it makes it more reasonable to contemplate mutual recognition between the EU and United States.

THE MOVE AWAY FROM MANDATORY COLLATERAL REQUIREMENTS

Although not directly comparable to the EU system of mutual recognition, the U.S. concept of an *accredited reinsurer* might broadly be considered a type of mutual recognition of reinsurers among the states within the United States. Despite the large variety of regulators in the United States, all reinsurers licensed in the United States are subject to direct supervision and a full spectrum of financial regulations similar to those applied to primary companies. U.S. ceding companies can take credit for reinsurance, provided the reinsurer is licensed in the United States. However, in view of the fact that non-licensed and non-U.S. reinsurers are subject to varying degrees of regulation and different accounting regimes, U.S. ceding companies are not allowed to take credit for reinsurance they purchase from these reinsurers unless they provide collateral.

It appears, however, that insurance industry participants and most supervisors agree that mandatory collateral requirements are not the optimal supervisory approach. Although collateral requirements have in the past provided an expedient approach to addressing concerns about reinsurance regulation and accounting differences across countries, they have a number of disadvantages. First, by immobilizing assets that cannot then be used elsewhere, they can in certain circumstances actually undermine a solvent reinsurer, to the extent that it experiences problems in one jurisdiction but cannot access assets because of a collateralization requirement imposed by another jurisdiction. Second, they fragment the capital base of reinsurers and undermine efficient capital management, so adding to the cost of business for the reinsurers required to post them. Third, collateral rules are not correlated with the credit risk of the reinsurer (that is, highly rated and lower-rated companies must post the same amount of collateral for a fixed dollar of reserves). And finally, from a financial system perspective, collateral requirements place banking institutions as financial intermediary between the insurer and its reinsurers and, in so doing, may increase credit risks for banks and raise the likelihood that systemic contagion may arise from the linkages between the reinsurance and banking sectors.

A number of trends affecting the reinsurance market may reduce the need for collateral requirements in the future. First, several major reinsurance jurisdictions are moving to "raise the bar" on regulatory oversight of reinsurers. The EU's coordinated efforts in this direction are an important development in this regard and the EU Reinsurance Directive will eliminate collateral requirements among member-states, which are seen as a barrier to trade. And second, advances in technology and expertise enable greater reliance to be placed on insurers' internal models of risk and their ability to evaluate reinsurance counterparties.

FINANCIAL STRENGTH

The main concern with official oversight of reinsurers, and a key concern in mutual recognition, is financial strength. Most of the supervisory regimes surveyed have some form of minimum capital requirement, but there is considerable variation across jurisdictions, including whether the requirements are risk-based. Within the capital calculation, a key area of concern is the loss and loss adjustment expense liability. This is based on an estimate of a firm's unpaid insurance obligations to primary insurance companies; is generally the largest liability on a reinsurer's balance sheet; and its mis-estimation has been identified as the major reason for past insurer and reinsurer insolvencies. Since adequacy of the loss reserve liabilities is a critical determinant of financial strength, most of the jurisdictions surveyed require actuarial opinions subject to review by the regulator.

RATING AGENCIES AND REGULATION

As noted in Chapter 2, rating agencies are commonly seen by reinsurers and their investors, counterparties, and others as the *de facto* reinsurance regulator. This reflects the fact that, in some jurisdictions, rating agencies have developed a closer relationship with and greater knowledge of the activities of reinsurance companies than have supervisors. In particular, the rating

agencies analyze entire groups, which many regulatory jurisdictions do not. To that extent, ratings may sometimes be more effective than supervisory analyses in allowing market participants quickly to obtain an overview of the financial strength of rated reinsurers.

That said, rating agencies are not regulators, as they are the first to acknowledge. Nor can ratings be a substitute for effective prudential supervision. In most jurisdictions, supervisors still have greater access to reinsurance companies than do the agencies. And supervisory authority is generally enshrined in statute, which enhances the leverage of supervisors compared with the rating agencies. Supervisors are also responsible for the prudential oversight of all reinsurance companies, including many smaller ones that will not be rated and are not particularly transparent. Beyond that, supervisors must take into account systemic facts that go beyond the position of individual reinsurance firms, whereas ratings focus on the individual firm. The role of supervisors is therefore quite distinct from that of the agencies.

REGULATION IN OFFSHORE LOCATIONS

Chapter 2 noted that the migration of insurance or reinsurance activity to offshore jurisdictions had provoked concerns about a lowering of standards of prudence and transparency. These concerns reflect the fact that certain offshore centers have tended to rely on self-regulation and the market discipline embodied in rating agencies' reviews as the extent of their monitoring of large insurers or reinsurers. Experience has shown that this approach can be seriously inadequate if poor corporate governance standards prevail. The reallocation of insurance business to centers with lower regulatory and transparency standards can undermine the reputation of the reinsurance industry internationally.

PRINCIPLES FOR FURTHER DEVELOPMENT OF REINSURANCE SUPERVISION

In evaluating current supervisory arrangements and plotting a course forward, a number of considerations need to be borne in mind:

- First, reinsurance firms are typically regulated in some fashion in most relevant major jurisdictions.
- Second, in spite of this, market discipline plays a very significant role in the assessments of the financial condition of reinsurers. This is seen both in terms of counterparty risk assessment by primary insurers and in the wider importance of ratings.
- Third, in some jurisdictions, there is a clear trade-off between the role of regulation and/or market discipline and the use of collateral to assure performance on reinsurance contracts. In cases where letters of credit are used, this simply transfers the need to assess the financial condition of the reinsurer from the primary insurer to the provider of the letter of credit. Where high-quality securities or cash collateral are used, the risk to reinsurance counterparties effectively vanishes, but at a cost in terms of market efficiency.

Given that these factors are unlikely to change in the near term, what should be the direction of future development of the supervisory framework and what principles should set that direction? Drawing upon the analysis in this and preceding chapters, the Study Group proposes the following guiding principles:

- The value proposition of reinsurance is global, which argues for global capital and risk management. The supervisory framework should support global activities to the extent possible. Regulatory or supervisory practices that are inconsistent with this approach should be avoided.
- Market discipline plays a central role in reinsurance and its role should be strengthened, with a clear focus on risk.
- Future growth of reinsurance capacity is likely to come, in part, from the capital markets. The supervisory framework should accommodate movement in that direction by focusing on risk-based models and capital measurement, and providing regulatory capital relief for properly formulated securitization transactions.
- For all the reasons discussed above, the supervisory model for reinsurance should limit its focus to key parameters — capital adequacy that is risk-based, and effective risk management and governance — and not pursue an expansive or overly intrusive model.

How can insurance supervisors achieve this combination of a light touch and global reach, of direct supervision but with fundamental reliance on market discipline? Can supervisors create incentives for positive change without mandating outcomes?

A GLOBAL CONSOLIDATED APPROACH

A global approach requires a consolidated view of the reinsurer, consistent with the firm's own view of its operations. It also demands consistent standards of supervision across jurisdictions and close cooperation in implementing them. Clearly, national laws, directives, and insolvency rules are likely to complicate the achievement of this objective, but progress needs to be made, based on the essential need for strong group-wide consolidated supervision of reinsurance groups across jurisdictions. Indeed, a comprehensive consolidated view should be the common theme of supervisory oversight, published reports, and the approach to risk management taken by the firm's own management. Each should be seeking a comprehensive understanding of the consolidated firm's financial strength, specific and aggregate risk profile, as well as its risk management approach, framework, and capabilities.

Consolidated supervision also has the potential to eliminate inefficiencies inherent in current multijurisdictional regulatory oversight frameworks for reinsurers. In particular, a consolidated framework could evolve toward a more efficient system where the consolidated supervisor plays a primary role in the supervision of reinsurers and is relied upon by other reinsurance supervisors. Such a system would benefit global reinsurers by streamlining the number and breadth of often divergent regulatory schemes. It would also provide efficiencies for supervisors, allowing them to focus their often limited regulatory resources where they are needed most.

Of course, the level of mutual reliance implied here — mutual recognition — will require higher supervisory standards in some jurisdictions and will require a strong framework for international cooperation. The IAIS offers such a framework and is already at work on many of the issues discussed in this report. Its ability to ensure widespread acceptance of the framework would be enhanced if it developed further to become a more significant policymaking body. There are a number of ways in which this might be facilitated. First, the eight major reinsurance jurisdictions, especially the Unites States and the EU centers, should make a strong commitment to the IAIS, not only in terms of resources but also by leading the way in adopting its international standards. Second, these jurisdictions should work together more closely to achieve consensus on approaches they will follow nationally and promote internationally in the IAIS. Third, the IAIS and the industry should carefully consider how best to organize interaction between the supervisory community and the industry, such that meaningful private sector input is available without hindering the IAIS's ability to take difficult decisions. Fourth, the IAIS would benefit from stronger ties to other international bodies, such as the Basel Committee on Banking Supervision, the FSF, the IMF, and the World Bank. Fifth, the IAIS should consider focusing its efforts in the short term on an area where it could make a "signal achievement" that bolsters its reputation and international standing. And finally, the IAIS would benefit from increased funding that would allow it to strengthen its secretariat, among other benefits.

STRENGTHENING MARKET DISCIPLINE

Supervisors are well positioned to ensure firms' adherence to meaningful and consistent disclosure regimes. Both supervisory and market oversight benefit greatly from being able to evaluate firms' financial resources, risk profiles, and risk management capabilities through comparable quantitative and qualitative measures.

Building on their ability to observe the full range of risk management practices employed by reinsurance firms, supervisory authorities are in a good position to understand differences in risk management approaches and assist in reconciling these differences through meaningful disclosures, without compromising the desire for firms' disclosures to reflect their specific approaches to risk. This may require direct regulatory reporting that is protected from public disclosure alongside published reports. It is also important for firms to be able to make investment and business decisions based not only on factors specific

to particular entities but also to be able to factor in the ability of parent companies to support a given subsidiary. In this regard, disclosures should reflect a firm's consolidated financial condition, along with the firm-wide approaches to risk management that are becoming more prevalent, particularly among the largest, most complex financial institutions.

A TARGETED APPROACH

Support for securitization and promotion of targeted supervision basically require a better understanding of and firmer focus on risk by the industry, the markets, and supervisors. It requires that the industry develop its tools for understanding, parsing, and pricing risk and that supervisors make sure that is where they focus. Placing emphasis on improvements in risk management practices by firms recognizes that regulators are rarely in a position to dictate risk management practices or substitute their judgment for that of a firm's management. Moreover, the increasing complexity of transactions and the ease with which risks can be transformed or taken on in different forms indicates a need to focus on the broader risk measurement and risk management processes that are being used by reinsurers to assess and control their risks on a firm-wide basis. This approach is consistent with the broader financial sector trend in favor of increased resources and attention to enterprise-wide risk management. While the degree of centralization involved differs widely across firms, a signature element of this trend is the desire to ensure a comprehensive approach to risk, so that individual risk elements do not "fall through the cracks".

Regulatory authorities are well-positioned to support improvements in risk management practice for two reasons. First, by observing practices across a wide range of firms, they can develop a much better sense of what works most effectively and can periodically provide guidance that reflects this informed perspective. Second and related, regulators by their nature have a greater capacity to compel reluctant firms to make necessary risk management improvements. Even when this authority is exercised rarely, its existence encourages change in a way that market discipline alone cannot.

As noted, a number of different supervisory approaches, as well as technical requirements (such as actuarial opinions, risk-based capital, and collateral), are applied to reinsurance firms. A call to focus on risk management is a more qualitative approach, but it appears to be consistent with current initiatives to improve the supervisory frameworks applied to reinsurers, which are looking to achieve a balance between the traditional quantitative requirements (including reserve adequacy and actuarial opinions) and a more risk-based approach that includes both quantitative measures of firm-wide risk and the net mitigating effects of firms' risk management systems and capabilities.

RECOMMENDATIONS

To achieve the objectives of the key principles proposed for a reinsurance supervisory framework, the Working Group recommends specifically that supervisors and regulators adopt the following approaches to reinsurance oversight:

- **Review and supervise the condition and activities of reinsurance companies on a consolidated basis.** The increasing prevalence of complex legal and transactional structures makes it essential for supervisors to review the totality of an organization's risk posture and financial soundness.

- **Internationally, pursue a more streamlined oversight framework characterized by greater harmonization.** This will require the relevant reinsurance and primary insurance supervisory authorities to strengthen their cooperation and place greater emphasis on the mutual recognition of other jurisdictions. This should limit the number of distinct oversight frameworks that global firms need to address, thereby reducing the overall regulatory burden.

- **Enhance the role of the IAIS,** as a supporting factor to greater harmonization. The major reinsurance jurisdictions should ensure that the IAIS has the capacity to foster meaningful

cooperation on cross-border home-host issues in reinsurance supervision and can play a key role in setting international standards for supervision and regulation that can form the basis of mutual recognition.

- **Offshore centers should adopt a supervisory code of conduct,** as another aspect of greater harmonization. A comprehensive and transparent effort to review and if necessary improve the substantive quality of their oversight regimes would enhance their capacity to participate in international discussions of supervisory convergence and mutual recognition.

- **Eliminate collateral requirements imposed either on a cross-border basis or even domestically —** to the extent that greater harmonization succeeds in addressing concerns about regulatory differences across countries. Such requirements will be eliminated in the EU by the EU Reinsurance Directive, given that they are regarded as a barrier to trade. They also are an added cost to reinsurers that are required to post them. The rules do not discriminate according to the credit risk of the reinsurer. Moreover, they place banks as financial intermediary between the reinsurer and the primary insurer and in so doing may increase credit risks for banks.

- **Encourage continued improvements in reinsurers' risk management practices.** Supervisors have a unique perspective on risk management practices across firms and this enhances their capacity to promote improvements.

- **Ensure that regulatory capital requirements are risk-based and calculated on a consolidated basis.** The inclusion of a risk-based capital measure within the supervisory framework helps ensure that the calculation is taken seriously and provides a powerful device for spurring necessary action by firms whose financial condition is deteriorating.

7. CONCLUSIONS

The reinsurance industry contributes to the stability of the financial system by facilitating the dispersion of risk exposures and the provision of liquidity to meet widespread claims following catastrophic events. But in the wake of the terrorist attacks of September 11, 2001, falling stock markets in 2001 and 2002, and concerns about the robustness of the credit derivatives market, the stability of the global reinsurance industry has been called into question in recent years. The Group of Thirty consequently commissioned a Study Group to evaluate these concerns and make recommendations designed to support the industry's development.

The Study Group collected a great deal of information on the industry, relating to its size and global significance, its market structure, and its main practices, including the nature of reinsurance contracts and the role of intermediaries. The Study Group also commissioned in-depth analyses of four key issues it had identified as being of particular importance to the study: the systemic importance of the reinsurance industry; the role of the capital markets in complementing the industry by securitizing insurance risks; the case for greater transparency and disclosure of reinsurance risks; and the appropriate regulatory environment. The overarching themes connecting these issues are the global nature of the reinsurance market and the need for the reinsurance industry to focus on risk — risk management, risk models, and risk-based capital. These themes were the analytical starting points for the Study Group's investigation of the structure, financing, transparency, and regulation of the industry.

The Study Group's work on the size and *systemic importance of the reinsurance industry* has led it to conclude that it is unlikely to pose a potential threat to the stability of the global financial system. The industry's asset base is small in relation to the size of global capital markets; its linkages with the banking sector are limited; its risk profile with respect to credit and other financial risks appears to be more akin to that of long-term asset managers than more leveraged institutions; and the industry has generally proved resilient in the face of substantial losses in the past.

Moreover, the Study Group has not been able to point to any convincing evidence of over-exposure to the credit derivatives market or of inadequate risk management of such exposures. In a simulation exercise, the Group finds that even a loss of some 20% of global reinsurance capacity — a loss event many times greater than anything experienced in the past — would be unlikely to cause widespread insolvencies in the primary insurance market and would have only limited effects on the financial system generally.

THE NEED TO REDUCE BARRIERS TO INSURANCE SECURITIZATION

One trend that might in time have an effect on the capacity of the reinsurance industry to generate contagion is the growth of *insurance securitization techniques in the capital markets.* Although this would broaden the channels through which developments affecting the reinsurance sector and securitized risks could have an impact on the financial sector generally, it would also lead to greater diversification of risks and provide reinsurance companies with better tools for managing

their own positions. This could, on balance, further reduce the likelihood of the reinsurance sector being a source of systemic risk.

The Study Group believes that insurance securitization is an essential element in the provision of adequate reinsurance capacity, especially in the low-frequency/high-severity risk areas. The reinsurance industry would benefit from a deeper and more liquid market for insurance securitizations because of its need to create additional, innovative, and more efficient forms of capital to supplement its traditional equity capital. These new forms of capital would be contingent in nature, offering new risk management options to insurance companies. They might also induce a smoothing of the cyclical pricing behavior of the industry. If structured appropriately — for example, to take account of basis risk — and transparently, they should be attractive to a larger investor base than merely equity investors.

Nevertheless, a number of barriers to the growth of the insurance securitization market exist, partly reflecting uncertainties and differences across countries in the legal, accounting, fiscal, and regulatory environments. The Study Group believes there is a role for public policy to play in reducing these barriers. In particular, **it recommends that regulators clarify their treatment of insurance securitization, especially the impact of securitization transactions on the statutory net worth and capital requirements of insurance companies. This, however, needs to be complemented by appropriate action by the industry, which needs to: identify, measure, and manage the risks involved in securitization effectively; move toward greater standardization of transactions where feasible; and ensure transparent and accurate capital markets pricing.** If these and other changes are made, the Study Group believes that the market could develop rapidly to satisfy considerable potential demand, both in the P&C and, increasingly, L&H sectors.

THE NEED FOR GREATER TRANSPARENCY

Conclusions about the systemic importance of the reinsurance industry, and the scope for further development of capital market complements to traditional reinsurance contracts, need to be tempered somewhat given the current *lack of transparency in the reinsurance market.* An essential pre-condition for the industry to play a broader role in the global financial system is that it must quickly and significantly improve its transparency to the financial community. Meaningful disclosures will enhance market discipline and give investors, clients, rating agencies, regulators, and the wider public assurance that reinsurance firms are pricing risks appropriately and are financially sound. This has been widely recognized in recent years, which helps to explain why international efforts by organizations such as the FSF and IAIS have focused on the need for enhanced disclosure. There are welcome signs of progress — in particular, the new annual IAIS Global Reinsurance Market Report, first published in December 2004 with 2003 data and published again in December 2005 with 2004 data.

Notwithstanding these efforts, public disclosure of risk information is currently very uneven across the reinsurance industry. And the IAIS initiative, albeit important, focuses on aggregated disclosure on a legal-entity rather than group basis. **The Study Group therefore recommends the adoption of a standardized framework for risk disclosure by individual reinsurers, focusing on group-level risk disclosure and the economic capital to support underlying risks at an overall portfolio level.** That is not to say that legal entity disclosure is not also important. Indeed, reporting at the legal entity-level is likely to remain fundamental for accounting, financing, and regulatory purposes. But reinsurance risks are essentially managed on a group-wide basis and hence improved risk disclosure by reinsurers needs to recognize that. The improved risk disclosure should extend to the governance processes to which firms adhere, the details of risk models used, whether stress tests are performed and the results of key stress scenarios, and the information designed to enable users to form judgments about the effectiveness and quality of firms' risk management processes.

The costs of the recommended additional disclosure are likely to be low, given that such disclosure is based on firms' existing risk management approaches and should not require them to obtain additional information. Appropriate industry groups and regulatory bodies, including the Geneva Association CRO

Round Table and the IAIS, should develop guidance for such disclosure and should encourage firms to adopt the recommended framework. In particular, **the IAIS should consider whether the relief obtained by primary insurers from purchasing reinsurance above a certain threshold should be conditional on whether the reinsurer(s) meet the recommended risk disclosure requirements.**

THE NEED FOR A MORE HARMONIZED REGULATORY APPROACH

The Study Group believes that regulators have a major part to play in ensuring a strong, resilient, and global reinsurance industry. *Regulatory regimes* have developed in piecemeal fashion in the main reinsurance centers and not always with regard to the peculiarities of the industry and the fundamental rationale for its supervision. **The Study Group recommends that regulators should make further efforts to develop a more harmonized regulatory approach across countries, based on strong and effective cooperative arrangements among supervisory authorities.** Such an approach would accord better with the global nature of the business. The approach should recognize that the wholesale nature of the industry, and the fact that the main buyers of reinsurance products are sophisticated financial institutions, makes conduct of business or consumer protection regulation inappropriate. It should also complement, rather than undermine, the incentives for market discipline currently in place in the reinsurance market.

The reinsurance industry's current lack of systemic significance that might threaten wider financial contagion, combined with the more exclusively wholesale nature of the business, suggests that the optimal regulatory regime for the reinsurance sector does not derive in a straightforward manner from the rationale for banking regulation. However, one similarity between reinsurance and banking is the importance in both industries of group structures in managing risks. **The Study Group therefore strongly recommends that supervisors worldwide adopt a regulatory approach that reviews the condition and activities of reinsurance groups on a consolidated basis, utilizing risk-based capital standards.** Improvements to regulation along these lines should enable national regulators to eliminate policies aimed at securing exclusive access to reinsurers' assets through collateral requirements or immobilization of capital. The full availability of reinsurance on a cross-border basis is a precondition for the globally diversified portfolios that benefit insurers and reinsurers worldwide. Restrictions on that availability are likely to increase costs globally and to retard the industry's development.

The Study Group is confident that adoption of the reforms it has recommended in the key areas of capital markets, risk-based disclosure, and regulation will improve the underlying strength and resilience of the reinsurance industry and provide the conditions and incentives in which it can continue to grow and develop.

APPENDIX 1. Membership of the Study Group and Working Groups

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APPENDIX 2. Glossary of Reinsurance Terms

This glossary is a selective and edited version of the glossary that appears on the Guy Carpenter website, available in full at www.guycarp.com/portal/extranet/utility/glossary_a.html?vid=1.

BROKER A reinsurance intermediary who negotiates contracts of reinsurance between a reinsured and reinsurer on behalf of the reinsured, receiving commission for placement and other services rendered from the reinsurer.

CAPTIVE An insurer that is wholly owned by another organization (generally non-insurance), the main purpose of which is to insure the risks of the parent organization.

CATASTROPHE REINSURANCE A form of excess of loss reinsurance (see below) that, subject to a specified limit, indemnifies the reinsured company for the amount of loss in excess of a specified retention with respect to an accumulation of losses resulting from a catastrophic event or series of events.

CEDENT (OR CEDING COMPANY) Correctly used as the reinsured in pro rata reinsurance (see below), where the reinsurer shares in the insurance liability, premium, and losses from the ceded policies of the reinsured. Informally referred to as the reinsured in excess of loss reinsurance, where the reinsurer indemnifies the reinsured for losses in excess of the reinsured's retention.

CESSION 1) The unit of insurance passed (or ceded) to a pro rata reinsurer by a primary company or cedent that issued a policy to the original reinsured. A cession may accordingly be the whole or a portion of single risks, defined policies, or defined divisions of business, all as agreed in the reinsurance contract.
2) The act of ceding, where such act is necessary to invoke the pro rata reinsurance protection.

CLAIMS-MADE BASIS The provision in a contract of insurance or reinsurance that coverage applies only to losses that occur and claims that are being made during the term of the contract.

COMBINED RATIO (also known as Operating Ratio or Trade Ratio) The arithmetic sum of two ratios: incurred loss to earned premium (see below), and incurred expense to written premium (see below). Considered the best indicator of underwriting performance.

DIRECT WRITER In reinsurance, a reinsurer that negotiates with a cedent without the benefit of a broker.

EARNED PREMIUM That portion of a written premium equal to the expired portion of the time for which the insurance or reinsurance was in effect.

EXCESS OF LOSS REINSURANCE A generic term describing reinsurance that, subject to a specified limit, indemnifies the reinsured against all or part of the amount of loss in excess of the reinsured's specified loss retention.

FACULTATIVE REINSURANCE In pro rata reinsurance, the reinsurance of part or all of the insurance provided by a single policy, with separate negotiation for each policy cession of insurance — for sharing liability, premium, and loss. In excess of loss reinsurance, the reinsurance of each policy, with separate negotiation of each — for indemnity of loss in excess of the reinsured's loss retention.

FOLLOW THE FORTUNES (FTF) A concept at one time inherent in any reinsurance relationship, which, when expressed in an agreement, generally includes a statement that the reinsurer "shall follow the fortunes of the ceding company in all matters falling under this agreement." Historically designed to deal with "errors and omissions", particularly in the case of inadvertent

omission by the ceding company of a specific risk, FtF enables the ceding company to include the risk upon discovery of the oversight with retrospective reinsurance. Interpreted by the courts to imply that a third party creditor of the primary insurer has a right of action against the reinsurer under a reinsurance contract. This is an exception to the general rule of law applicable to reinsurance agreements that they operate solely between reinsured and reinsurer and afford no right of action by any third party against the reinsurer in relation to a reinsurance agreement.

FOLLOW THE SETTLEMENTS (or follow the actions) (FtS) A concept that does not permit adjustment of the reinsurance contract between the reinsurer and the reinsured, but at the same time restricts the risk taken on by the reinsurer to elements that are under the control of the primary insurer, as determined in its contractual relationship with the original insured. Unlike FtF, this is likely to be interpreted by the courts as not allowing a right of action by a third party creditor of the primary insurer against a reinsurer in relation to anything not specified by the primary insurer in its contractual relationship with the insured. The reinsurer in return has an obligation to recognize as binding the decisions and measures taken by the primary insurer within the scope of its contractually unrestricted right to business management.

INCURRED BUT NOT REPORTED The liability for future payments on losses that have already occurred but have not yet been reported in the reinsurer's records. This definition may be extended to include expected future development on claims already reported.

INCURRED EXPENSE RATIO (or "expense ratio") The relationship between expenses that have happened but may or may not have been paid and written premiums, usually expressed as a percentage.

INCURRED LOSS RATIO (or "loss ratio") The relationship between incurred loss and earned premiums, usually expressed as a percentage.

INTERMEDIARY CLAUSE A provision in a reinsurance contract that identifies the specific broker involved in negotiating the contract, communicating information, and transmitting funds. The clause should state clearly whether payment to the broker does or does not constitute payment to the other party in relation to the reinsurance contract. Currently, a widely used clause provides that payments by the reinsured company to the broker shall be deemed to constitute payment to the reinsurer(s) and that payments by the reinsurer(s) to the broker shall be deemed to constitute payment to the reinsured company only to the extent that such payment is received by the reinsured company.

LAYER The total amount of excess of loss reinsurance protection that a company needs to protect a given set of exposures is usually split into pieces or layers, and separate contracts are written, which have similar or identical terms but separate limits, summing to the total amount required.

LONG-TAIL LIABILITY A term used to describe certain types of third party liability exposures (such as malpractice, products, errors and omissions), where the incidence of loss and the determination of damages are frequently subject to delays that extend beyond the term the insurance or reinsurance is in force.

LOSS RESERVE For an individual loss, an estimate of the amount the insurer expects to pay for a reported claim. For total losses, an estimate of the expected payments for reported and unreported claims.

NET LOSS RETENTION The amount of loss that an insurer keeps for its own account and does not pass on to another insurer or reinsurer. In excess of loss reinsurance, known as "first loss retention".

PRO RATA (or proportional or participative) REINSURANCE A generic term describing reinsurance in which the reinsurer shares a proportional part of the ceded insurance liability, premiums, and losses of the ceding company. Divided into quota share and surplus share reinsurance (see below).

QUOTA SHARE REINSURANCE A form of pro rata reinsurance in which the reinsurer assumes an agreed percentage of each insurance being reinsured and shares all premiums and losses accordingly with the reinsured.

RECOVERABLE An amount due to be received by the reinsured company from the reinsurer, in respect of a valid claim under a reinsurance policy – comparable to an account receivable.

REINSURANCE PREMIUM 1) An amount paid by the ceding company to a pro rata reinsurer in consideration for sharing an insurance policy liability, premium, and losses.
2) An amount paid by the ceding company to an excess of loss reinsurer for the indemnity of the reinsured's losses above the agreed loss retention.

RETENTION The amount of insurance liability (in pro rata, for participation with the reinsurer) or loss (in excess of loss, for indemnification of excess loss by the reinsurer) that an insurer assumes for its own account.

RETROCESSION The reinsuring of reinsurance. Retrocession is a separate contract and document from the original reinsurance agreement between a primary insurer (as the reinsured) and the original reinsurer. It may cover a single risk or a carefully defined group of risks, structured as pro rata or excess of loss reinsurance.

RETROCESSIONNAIRE The assuming reinsurer in a retrocession, whereas the ceding reinsurer is known as the retrocedent.

STOP LOSS REINSURANCE A form of aggregate excess of loss reinsurance that indemnifies the reinsured against the amount by which the reinsured's losses incurred (net of specific reinsurance recoveries) during a specific period exceed either an agreed amount or an agreed percentage of some other business measure, such as aggregate net premiums in the same period.

SURPLUS SHARE REINSURANCE A form of pro rata reinsurance indemnifying the ceding company against loss to the extent of the surplus insurance liability ceded, on a share basis similar to quota share.

TREATY A reinsurance agreement between the reinsured company and the reinsurer, which stipulates the technical particulars applicable to the reinsurance of some class or classes of business.

UBERRIMAE FIDEI (utmost good faith) A defining characterization or quality of certain contractual relationships, including reinsurance. Under this principle, the nature of reinsurance transactions is dependent on mutual trust and a lively regard for the interests of the other party. A breach of uberrimae fidei, especially in regard to full and voluntary disclosure of the elements of risk of loss, is acceptable as grounds for any necessary reformation or redress, including rescission.

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APPENDIX 4. Applications of Securitization

Insurance-linked securities have been developed as a complement to traditional reinsurance. They have helped address specific risk and capital management needs of both primary insurance companies and reinsurance companies.

PROPERTY & CASUALTY INSURANCE

To date, most issue activity involving insurance securitizations and associated capital market instruments has been in the Property & Casualty (P&C) field, stimulated by a desire to enhance risk diversification.

The most developed market is that of so-called catastrophe (CAT) bonds. CAT bonds can be classified according to:

- The number of perils or risks they cover (single- or multi-peril)
- The period covered (single- or multi-year — the average is three to five years)
- The type of losses covered (per event or aggregate)
- The loss triggers (for example, first event or second/third event, parametric, index-based, indemnity, or modeled-loss).

Natural Catastrophe

The bulk of the issues have related to natural disasters in France, Germany, Japan, and the United States, such as windstorms or earthquakes. CAT bonds are generally structured to cover the lowest-probability and highest-severity risks. As the market has grown, investors have become more comfortable with higher-probability risks. Transactions now include cover for events expected to occur once every 20 years.

CAT bonds are structured so that:

- A securitization vehicle issues notes to investors.
- The proceeds of the issuance are invested in high-quality collateral.
- In case of a claim, the securitization trustee instructs that the collateral be sold to pay the loss to the sponsor.
- If no claim arises within the term of the notes, the collateral is liquidated to repay the investors.

Catastrophic Mortality

In 2003, a CAT bond was issued covering catastrophic mortality in a pool of five countries (Vita Capital) (see discussion below). Although it does not relate to a P&C event, the bond contains similar structural characteristics. As with a CAT bond, the transaction would pay the buyer if a low-frequency, high-severity event occurred.

Other Risks

Other risks securitized to date include financial market events (Catastrophe Risk Exchange, or CATEX Swaps; Catastrophe Equity Puts, or CAT-E-Puts) and cancellation events, such as the Golden Goal transaction, which covers the cancellation of the next FIFA Football World Cup.

To date, risks relating to terrorist events have not been securitized explicitly, primarily reflecting the lack of credible quantitative analysis of the probabilities of loss from such events. However, in the FIFA transaction, terrorism is the largest component of the probability of loss, and Vita Capital (the catastrophic mortality transaction) did not exclude terrorism risk. Coverage of this type of risk may grow, given that substantial work has recently been done in this area.

CAT bonds should be regarded as a complement to, rather than a substitute for, reinsurance. When a severe event triggers a bond, it is likely to have an effect across the entire insurance industry. Reinsurers are likely to be adversely affected, depending on their own portfolio risk diversification. Not only does this leave the primary insurer less able to benefit from any

ensuing re-rating of premium prices, but it also potentially weakens its overall reinsurance relationship. By contrast, the collateralized nature of an insurance-linked security and the systematic claims payment process ensures that the benefit is readily available.

Both new risks and new structures have been introduced to the insurance-linked securities market recently. While it is hard to predict where innovation will occur, interest is likely to increase in speciality lines (such as event cancellation) and many other non-life lines, including working layers risks.

While expansion to include new risks will take time, investor demand for diversification and relative value, as well as potential sponsors' needs for innovative solutions, should induce the industry to adopt new initiatives. In some cases the securitization structures and analysis are likely to borrow from techniques available in the asset-backed securities market, which should be helpful for the investor community.

Originators of non-life securitizations have not been confined to reinsurers and insurers. Some recent issues have been sponsored by utilities, non-financial corporations, and public authorities.

LIFE & HEALTH INSURANCE

While securitization techniques in the Life & Health (L&H) industry are still in their infancy, there are several areas of potential application. Broadly these fall into four categories:

- Capital release, primarily in the form of the securitization of expected future profit flows from an existing business portfolio (so-called embedded value securitization)
- A financing instrument for new business sales (an alternative to traditional financial reinsurance)
- Product-specific issues, such as capital relief on the difference between regulatory and economic provisioning (for example, reserves set aside under Regulation XXX in the U.S. term assurance market).
- A partial solution to the industry's desire to balance the risks between mortality and longevity.

Each of these four applications is examined in detail below. The discussion concentrates on the experience to date, the challenges to further development of the market, and the obstacles that need to be addressed.

Embedded Value Securitization

The most common form of securitization in the life insurance sector to date has been embedded value securitization. In addition to the capital deployed in support of its life insurance activities, an insurer also has a potential store of worth in the form of expected future profits on policies already sold. An insurer can choose either to allow such an in-force portfolio to mature and derive a flow of future income as the policies run off, or realize the value of these future streams of income through a trade sale or alternative mechanism. Securitization is such a mechanism.

Profits from a portfolio can emerge over a very long time — particularly in the case of pension products. From the insurers' viewpoint, securitization offers the prospect of turning this future income into capital. It also generates a relatively stable income flow to support a potentially long-dated capital market instrument. Securitization can offer either an alternative to an outright trade sale or simply a means of efficient financing to support other business activities.

Embedded value securitizations in the public markets have thus far been carried out mainly in the United Kingdom and the United States. In the UK, two major transactions have been completed since November 2003. Both were wrapped by an AAA-rated monoline. In the United States, a recent important transaction was Queensgate Special Purpose Limited, closed in January 2005. It was placed without a monoline wrap and introduced two tranches of notes rated below the single-A range.

The Queensgate transaction is notable for its innovative profile and degree of risk transfer to the capital markets. The capital structure is: Series A notes totaling $175 million, rated A+/A1 by Standard & Poor's and Moody's; Series B notes totaling $45 million, rated BBB/Baa1 by Standard & Poor's and Moody's; and Series C notes totaling $25 million, rated BB/Ba1

by Standard & Poor's and Moody's. Risk retained by the reinsured is approximately the first 13% of the projected embedded value. Risks transferred to capital markets include mortality, lapses, investment asset quality, reinvestment risk, and reinsured credit risk.

Financing New Business Activities

In the same way that the future statutory cash flows from an established portfolio of policies can be used to support servicing and repayment for an instrument, it is also possible to use the cash flows of a particular cohort of new sales for the same purpose.

Take, for example, a standard endowment assurance written for a term of 20 years with a regular annual premium of €1,000. The insurer will incur a statutory loss (or invest capital) of perhaps €300 in the first policy year, arising from acquisition expenses, commissions, and statutory reserving. However, over the remaining 19 years, the policy is expected to generate returns averaging perhaps €40 per year (although not necessarily on an even trajectory). Insurers with limited capital resources have traditionally used the reinsurance market to absorb some of the new business strain, either through direct quota sharing or through a scheme of financial reinsurance. Securitization, however, can offer an alternative mechanism to satisfy this same need.

The first securitization in the United Kingdom backed solely by new business premiums (and commission clawbacks) was marketed in October 2004. It involved a £200 million issue by Norwich Union (part of Aviva Plc), relating to its new business, primarily in the term assurance and mortgage protection markets in 2004. The structure enables Norwich Union to diversify its funding sources away from traditional reinsurance and equity and debt capital, while achieving an impact similar to that of reinsurance.

Further activity in this field is likely, as primary insurers become more sophisticated in "parceling up" appropriate policy cohorts for securitization and as capital markets become more familiar with the asset class. This should relieve a potential capital constraint on industry growth because capital provision will no longer be wholly reliant on the life reinsurance market (which itself has undergone consolidation and thus suffers from concentration risk).

Variations on this technology could have a material impact on the basic business model of life insurance companies. New business strain creates a significant capital burden for insurance companies, driving down profitability in the short term in terms of both internal rate of return (IRR) and return on equity (RoE), and creating a barrier to entry into the underlying business. New business securitization can provide a mechanism to move the insurance business model toward that of banking, creating a sustainable self-financing business model.

Product-specific Applications

It is likely that securitization techniques can offer a timely solution to a number of ad hoc issues that the insurance industry faces in the United States. One such issue is Regulation XXX reserving for term products. The resulting reserves are generally significantly higher than reserves a company might hold under U.S. Generally Accepted Accounting Principles (GAAP). This results in a significant additional cost of capital.

Historically, for relief from Regulation XXX reserves, U. S. primary companies have relied on financial reinsurance transactions with non-U.S. reinsurers. With the expected growth of Regulation XXX reserves, which has been estimated to be in the range of $100 billion, capacity in the reinsurance market is likely to be insufficient and the need for collateralization, in the traditional form of letters of credit, will be costly. Moreover, given the increasing consolidation in the reinsurance market, direct writers will have to address issues of credit concentration.

The first significant transaction relating to Regulation XXX was undertaken by First Colony Life Insurance Company, a subsidiary of Genworth Financial Inc., in July 2003. By end-2004, $600 million had been raised through this transaction, with an additional $550 million available within the structure for future growth. Two further Regulation XXX transactions have recently closed: $550 million by Banner Life, a subsidiary of UK insurer Legal & General; and $850 million by the U.S. unit of Bermudan-based Scottish Re.

Mortality and Longevity

The first securitization of excess mortality risk was undertaken by Vita Capital Ltd. in December 2003. It provides protection against a catastrophic increase in mortality in a pool of five countries. The transaction was structured along the lines of a traditional catastrophe bond, for a very high risk layer, and was motivated more by economic capital and risk management factors than regulatory or rating agency capital management. The capital markets were seen as the best fit, given that the protection buyer had a fully collateralized cover — an important consideration in a distressed scenario that could severely affect the credit rating of the main reinsurers in the world.

Once the capital markets become familiar with the technology, it is likely that transactions will be possible at a less remote probability level, thus creating value not only from the standpoint of economic capital, but for the more material levels of regulatory and rating agency capital as well.

For many years, the key business proposition of life insurers was to offer customers protection against the risk of dying too early. Today, a major part of the business involves absorbing the risk that customers may live longer than expected and exhaust their assets.

This area could provide a major boost to the securitization of life insurance risks, which will have repercussions well beyond the insurance industry. The exposure to longevity risk is enormous not only for insurers, but for pension funds and government. It is certainly too large for any pure insurance solution — and there is currently no methodology of risk management.

Longevity risk securitization has been discussed for some time in the market. To date, the main struggle has been to match the needs of primary insurers, looking for long-dated protection with minimum basis risk that also provides regulatory capital relief, with the risk and return appetite of capital market investors, particularly for long-dated notes.

The first transactions including a degree of longevity risk were the equity release securitizations in the United Kingdom and United States to provide protection to investors from the risks of higher than projected longevity combined with lower than projected house price inflation. The first pure longevity bond was a sterling-denominated 25-year issue from the European Investment Bank (EIB), aimed at pension fund providers. The transaction provides some degree of economic cover to pension funds and annuity providers because, if the expected mortality rate declines, the investor would receive a higher amount under the terms of the note. This should at least partially compensate for the higher than expected payments to annuitants and pensioners.

The structure, however, does not target a specific investor, and the degree of basis risk facing any pension and annuity provider means that the degree of regulatory capital relief from such a transaction is unlikely to be significant. Also, the longevity risk element in the transaction has been fully absorbed by a reinsurer.

There is apparently little extra capacity for new transactions of this kind. The market is therefore still waiting for a transaction in which longevity risk is transferred to capital market investors through a securitization structure. Given the urgent need of the insurance industry for a solution to this problem, the market will probably see a transaction of this kind in the not-too-distant future.

APPENDIX 5. INTERNAL RISK MODELS FOR (RE)INSURANCE[1]

Internal risk models for insurance companies have been the focus of increased attention lately.[2] Driven partly by developments in the banking industry (notably Basel II), insurance regulators and rating agencies have started to consider the possibility of assessing the capital adequacy of an individual company by allowing it to use its own internal risk models. This appendix focuses on the main desirable features of internal risk models and their limitations.

Internal models should meet at least two requirements. First, they should focus on the economic impact of risk rather than its impact on accounting figures, given that a non-economic accounting convention can at best delay the recognition of risk or losses. Second, internal models should be based specifically on the company's own business. After all, it is the materialization of risks specific to the company's own books that has the potential to impair its ability to pay claims.

This discussion starts by explaining why capital adequacy is crucial not only for cedents, supervisors, and rating agencies, but also for reinsurance companies. It then outlines the elements of a comprehensive internal risk modelling approach and concludes by addressing the limits of what internal models can do for a company.

RISK-BEARING CAPITAL

Through their underwriting and investment activities, insurance companies gain exposure to insurance, credit, and financial market risks. An essential prerequisite for underwriting insurance risk is adequate risk-bearing capital: that is, economic net worth (essentially the difference between the market value of assets and the present value of liabilities) that acts as a buffer against unexpected losses. The need for risk-bearing capital, which is provided by shareholders,[3] stems mainly from the concerns of cedents and regulators relating to the claims-paying ability of the reinsurer. Risk-bearing capital is essential for the "production" of insurance coverage. In the case of traditional insurance, this production essentially involves:

- Pooling sufficiently independent and balanced risks in a portfolio, thereby reducing the (relative) volatility of the aggregate claims to a manageable level
- Investing premiums in financial assets to generate the cash flows necessary to pay future expected claims, and
- Holding risk-bearing capital to absorb unexpected losses.

In general, the market capitalization of insurance companies is higher than their economic net worth. The difference between market capitalization and economic net worth represents franchise value. This is the value that investors attach to the insurer's ability to generate economic profits from future business. It is often equated with the value of the insurer's client relationships and human capital.[4]

Franchise value can help explain why policyholder sensitivity to the insurer's continuing ability to pay claims also provides a powerful incentive for insurers to hold more capital rather than less. Whenever an insurance company experiences financial distress, its shareholders stand to lose significant amounts of franchise value because existing clients may move their business and potential new clients are likely to be deterred. To protect their franchise value, insurers therefore have an incentive to hold more capital rather than less.

1 See also Pablo Koch, Frank Krieter, and Stephan Schreckenberg (2003), "Tailoring Internal Models," *Risk Magazine* (March).
2 The term "insurance" is defined in this appendix to include both insurance and reinsurance.
3 This appendix focuses on shareholding companies, although the arguments here also apply to other legal forms.
4 For an overview of the role of capital costs in insurance, see J. Hancock, P. Huber, and P. Koch (2001), "Value Creation in the Insurance Industry", *Risk Management and Insurance Review* 4 (2): 1–9.

Franchise value can also help explain why insurers do not hold arbitrarily large amounts of capital, because this will translate into higher capital and production costs. A higher capital base will force an insurer to raise premiums in order to generate the same economic profits. But there is a limit to the price cedents will pay for added security.

When determining the optimal amount of capital to hold, an insurer will need to strike a balance between adequate security and appropriate premiums in order to maximize franchise value. Formally stating this optimization problem — let alone solving it — is fairly complex, and overcoming this requires some practical concessions. These consist of assuming that the optimal level of capital is achieved for a given level of security, and specifying how this level of security translates into a given amount of capital. The following sections outline how internal models can be used to assess the amount of capital required to achieve a certain level of financial strength.

INTERNAL RISK MODELS

Internal risk models can give a precise meaning to the phrase "holding a given amount of capital to maintain a given level of security". They are therefore important from the perspective of capital adequacy. Moreover, internal risk models should also facilitate the determination of the contribution to total risk of the various businesses pursued by an insurer. Without this feature, they would be of little use in managing risks and determining the performance of the various lines of business or profit centers.

For practical reasons, risks are usually grouped into categories, mainly according to how they are managed. One widely used classification distinguishes between insurance underwriting, credit, financial market, and operational risks.

Underwriting, credit, and financial market risks can all affect the economic value of both assets and liabilities. For example, the economic value of insurance liabilities is roughly equal to the present value of future payments and is therefore exposed to interest rate risk. Conversely, interest rate risk also affects the market value of the bonds the insurer holds in its investment portfolio. At the same time, these bonds are exposed to the risk that the issuer might default on its obligations. Thus there is a credit risk. However, bonds are not the only source of credit risk. And an insurer may provide protection against credit risk, so that a credit risk exposure can also occur on the liability side of the balance sheet. Finally, an insurer is exposed to insurance risk on the liability side — for instance to natural catastrophe or casualty risk — and may also become exposed to catastrophe risk on the asset side if it chooses to invest in, say, CAT bonds linked to earthquake risk or if it holds securities issued by companies also exposed to insurance risk. It follows that one source of risk can possibly affect several different positions on the economic balance sheet. There may also be interdependencies among the various sources of risk, thereby necessitating an integrated approach to risk modelling.

Operational risk — defined by the Basel Committee on Banking Supervision (BCBS) as "the risk of loss resulting from inadequate or failed internal processes, people, and systems or from external events"[5] — does not affect the value of either assets or liabilities directly, but has often been the ultimate cause of company failures. While the importance of operational risk is widely recognized, it is usually excluded from integrated risk approaches because it is extremely difficult to quantify. (The quantification of operational risk is currently the subject of intensive research.) But whether it is explicitly quantified or not, the company's capital also acts as a protection against operational risk-related losses.

AN INTEGRATED ECONOMIC APPROACH

Any economic approach to capital adequacy must focus on the impact of risk on economic net worth over the relevant period: that is, on the impact of risk on the economic profit and loss statement[6] for the period in question. Any integrated approach must recognize that economic losses to the company are ultimately

5 See BCBS (2003), "Sound Practices for the Management and Supervision of Operational Risk", Bank for International Settlements.

6 Usually there are two main sources of difference between economic and accounting profit and loss statements. First, total investment returns are considered in economic figures — not only investment income and realized gains. Second, changes in the economic value of liabilities are recorded in economic figures — not changes in technical reserves.

determined by the combined effect of financial market movements, the materialization of the various insurance risks, and the actual defaults or changes in credit quality of companies to which there is a credit exposure. Note that while only a single period is considered, the risks of future cash flows are also captured, since the economic profit and loss account includes changes in their present value — albeit only those changes that depend on the information that becomes available within the observation period (such as revisions of claims information, new assessment of mortality tables, and financial market information).

Consequently, the combined effect of all relevant individual risk exposures and their dependencies needs to be modelled and quantified. This is the only way to give precise meaning to diversification and accumulation effects. For example, the impact of adding a new risk to the existing portfolio — say, when making an acquisition — can be assessed only in the context of the entire portfolio.

Indeed, adding a risk exposure independent of the rest of the portfolio reduces the relative variability of losses on the overall exposure, thus better diversifying the portfolio. For instance, a portfolio with exposure to earthquakes in California will typically achieve greater diversification if it also includes an exposure to earthquakes in Japan. Conversely, if the risk exposure being added shows a positive dependency with a risk already present in the portfolio — so that losses tend to occur at the same time — the result will be risk accumulation. A case in point is credit risk, which shows a strong correlation with financial market risk.

RISK FACTORS AND PORTFOLIO MAPPINGS

Modelling the impact of risk on the company's economic profit and loss involves four stages. The first is to identify the various risk factors to which the company is exposed and select a subset — considered sufficiently representative — to be modelled. Second, stochastic models are constructed for the selected risk factors. Since for practical reasons it is not always possible to select a set of independent risk factors, the third step deals with modelling the dependencies among the different risk factors. Finally, so-called portfolio mappings are specified, describing how realizations of these risk factors translate into profits or losses through their impact on specific positions in the insurer's portfolio. This approach aims at separating the cause of risk from the company's exposure to it, and thus facilitates a systematic analysis of the impact of changes in the composition of the portfolio.

The broad risk categories may contain a multitude of individual risk factors, depending on the specific risks to which a particular insurer is exposed but also on the relevance attached to them. For example, underwriting risk factors may include natural perils (such as windstorms in Germany or earthquakes in California), casualty (such as product recall), or mortality, while financial market risk factors may include various equity indexes, foreign exchange rates, or interest rates.

These four stages require much idealization in the modelling process. To construct an appropriate model, its intended use must be borne in mind at all times. When integrating various risks and positions, it must be ensured that the model is:

- *Complete,* so all relevant elements are included. This may require a consideration of risks that have not materialized before or whose manifestation is uncertain.
- *Consistent* across the individual risk assessments, so that the various relevant elements are treated comparably.
- *Forward-looking,* addressing the true riskiness rather than merely those aspects captured by statistics based on observations of the recent past.

Probabilistic risk factor modelling is not easy. It is far more complex than standard stress-testing techniques that do not assign probabilities to particular stress scenarios. One difficulty is that generally the low-frequency/high-severity region of an underwriting risk factor — that is, its tail — cannot be modelled merely by collecting information and drawing statistical inferences from past experience. In this case, statistical information needs to be complemented by so-called threat scenarios. These consist of expert assessments of the probability and impact of rare types of events whose occurrence cannot be inferred from available data.

Clearly, it is neither possible nor desirable to specify an exhaustive list of threat scenarios describing every possible event. Instead, the selected threat scenarios must be regarded as being representative of what might happen. For example, one could think of a large-scale accident occurring at a chemical or nuclear plant, which releases poisonous material into the air or water supply and which cannot be immediately reversed or prevented. This could cause both life and health claims. Expert judgment is required to determine when such an event could pose a significant threat to a company and the frequency with which it could be expected to occur. For example, for the event to be a significant threat, it would have to occur in the proximity of a major, developed, and highly populated area with high insurance coverage, such as Western Europe, the U.S. East Coast, or metropolitan Tokyo.

The clear separation of risk factors on the one hand and their impact on the insurer's book on the other concentrates attention on modelling interdependencies among risk factors. This is more intuitive and reliable than directly modelling dependencies among sub-portfolios. In the former approach, accumulation and diversification effects are captured in a systematic fashion.

AN OPERATIONAL INTERNAL MODEL OF CAPITAL ADEQUACY

Once the risk factors and their dependencies have been modelled and portfolio maps specified, the probability distribution of the company's economic profit and loss can be derived. This distribution contains all the ex ante information on how the random behavior of the insurer's business book and investment portfolio affects economic net worth — at least, inasmuch as it is captured by the underlying model.

The entire probability distribution can be condensed into a single figure, based on a so-called summary risk measure that can be translated into an amount of required capital. Examples of widely used summary risk measures are Value-at-Risk (VaR) and expected shortfall.

BOX A5-1 99% VAR AND 1% SHORTFALL

99% VAR depicts the amount of capital that can be lost in an adverse year that is exceeded only once in a hundred years. The 99% VaR does not give an indication of how large such an excess could be.

1% SHORTFALL depicts the average amount of capital that can be lost in events with a frequency of less that once in a hundred years. As such, it can give an idea of the possible downside in case of such rare events.

Both VaR and expected shortfall measure potential negative deviations of the economic profit and loss of a given portfolio from its expected value over a given time horizon, which for insurers is commonly set to be one year. The 1% VaR measure corresponds to the once-in-a-hundred-years economic loss.[7] A 1% VaR divides losses into those having a frequency greater and those having a frequency of less than once in a hundred years. The 1% expected shortfall corresponds to the average losses that can occur with a frequency of less than once in a hundred years (see Box A5.1). Overall expected shortfall denotes the 1% shortfall of the overall portfolio. When the 1% shortfall is applied to a sub-portfolio, the term standalone shortfall is used.

Since the economic profit and loss depends on all risks to which the insurer is exposed, both VaR and expected shortfall will crucially depend on the overall — or aggregate — portfolio composition, including all insurance and investment portfolios. In particular, VaR and shortfall capture diversification effects: for any split of the overall portfolio into sub-portfolios, the sum of the stand-alone VaRs/shortfalls is greater than or equal to overall VaR/shortfall.[8]

7 The term "1% VaR" is used to refer to the once-in-a-hundred-years aggregate economic loss over a one-year horizon (one calendar year). This use of VaR does not prescribe any particular form of the distribution nor does it prescribe any method for calibrating the model, such as an exclusive use of historical data. This may be in contrast to the narrower use of the term, sometimes encountered in the banking context.

8 This statement is always true for expected shortfall. For VaR, the statement is not always true. It holds in the case of continuous probability distributions. More on this topic can be found in the literature related to coherent risk measures, such as P. Artzner, F. Delbaen, J.M. Eber, and D. Heath (1999), "Coherent Measures of Risk", *Mathematical Finance* 9 (3): 203–28.

As summary measures, both VaR and expected shortfall allow the amount of capital required to ensure a desired level of security to be specified. Hence required capital could be defined as being equal to a multiple of 1% VaR or of 1% expected shortfall of the overall portfolio.[9] If the insurer holds capital equal to the 1% VaR of its overall portfolio, it will be able to withstand exactly a loss of the size of the once-in-a-hundred-years loss. If the insurer holds capital equal to the 1% expected shortfall of its overall portfolio, it will be able to absorb a loss of the size of the average loss occurring with a frequency of less than once in a hundred years. Both measures provide a way for a company to express its risk tolerance.

To establish the adequacy of an insurer's capitalization, required capital is compared with available capital: that is, with economic net worth. In addition, to cross-check the plausibility of the model, stress scenarios — pre-defined concrete events that may or may not be based on past occurrences — can be used. Typically, scenarios are not assigned probabilities and may be used additionally for the following two purposes:

- To limit the risk exposure to that particular scenario, and/or
- To consider and implement early warning systems and/or mitigation procedures in case such an event were to happen.

The particular stress scenarios chosen need to be based on the particular risks on an insurer's book. After all, a fixed set of scenarios may either be entirely irrelevant for a particular book of risks or may miss significant risks to which the company is exposed.

THE ELEMENTS OF AN OPERATIONAL INTEGRATED RISK MODEL

The elements of an operational integrated risk model that may be used both for capital adequacy and for risk-steering purposes can now be summarized. These elements comprise:

- A collection of models for all individual risk factors and their interdependencies
- A collection of models to capture how risk factors affect the economic profit and loss statements of the various sub-portfolios
- A procedure to calculate required capital at an overall level
- A procedure to calculate the contributions of the various risk portfolios to total risk.

Such models must be carefully and continuously maintained to ensure timely incorporation both of new exposures and of the most recent knowledge about risk factors and their dependencies. This in turn helps to take advantage of the insights gained during the modelling work.

THE LIMITS OF A RISK MODEL

A quantitative risk model, however comprehensive, cannot be a surrogate for management decisions and common sense. An important prerequisite for seriously monitoring capital adequacy, and for making the most efficient use of available capital, is risk transparency. Achieving this requires both a state-of-the-art risk measurement framework, as described above, and adequate processes for identifying, measuring, and reporting risk exposures. These processes, which among other things determine the reliability of risk information, need to be well established within the organization, and to include the collection of exposure data and the incorporation of new types of exposure into the integrated risk model.

The organizational structure of an insurance company should support a sensible culture for dealing with risk. Ideally, a clear separation of the roles of the risk owner, the risk taker, and the risk manager/controller should be established. Moreover, top-level com-

9 Here the argument has been simplified. An insurer will generally hold more capital than indicated by the 1% shortfall. There are at least two reasons for this. First, the company aims to continue operations after an adverse event, in which case capital in excess of 1% shortfall must be held. Also, the insurer's portfolio generally includes liabilities with a maturity of considerably more than just one year. However, it is not economically feasible to hold capital amounts that virtually ensure that all future obligations can be honored at all future times; cedents would not be willing to pay for this degree of security. Nevertheless, in order to address the cedent's concern with security, holding additional capital can provide financing flexibility after a major adverse event, so that capital strength can be restored at a reasonable cost.

mittees should take an active interest in strategic risk management issues and ensure that a system of limits for risk-taking activities is in place. Finally, a risk-adjusted performance measurement system will create the right incentives for disciplined risk taking.

CONCLUSION

Properly established, internal risk models will continue to gain popularity within the insurance industry, regardless of whether regulators and rating agencies ultimately allow them to be used to determine the financial strength of companies. There are two main reasons for this. First, internal risk models build on the insurer's own portfolio — the only reliable basis for ensuring a true risk assessment. Second, they are crucial for accurate measurement of risk-adjusted performance.

APPENDIX 6. Initiatives to Enhance Reinsurers' Disclosure

IAIS	IAIS Standard No. 9 *Standard on disclosures concerning technical performance and risks for non-life insurers and reinsurers.* Issued in October 2004, this is the first of three standards from the IAIS regarding public disclosure requirements. The standard addresses the analysis of technical performance; key assumptions and sources of measurement uncertainty; and sensitivity, stress testing, and scenario analysis (including sensitivity analysis of both assets and insurance liabilities). IAIS Standard No. 11 *Standard on disclosure concerning investment risks and performance for insurers and reinsurers.* Issued in October 2005, this standard covers the disclosure of investment objectives, policies, and management; asset class segregation, description and profiling; performance measurement; and risk exposure of insurers. Preliminary work is underway on a draft IAIS *Standard on disclosures concerning technical performance and risks for life insurers and reinsurers,* which is planned to be issued at some point in 2006.
IASB	IFRS 7 on *Financial Instruments: Disclosures* requires entities to provide disclosures in their financial statements of: • the significance of financial instruments for the entity's financial position and performance • qualitative and quantitative information about exposure to risks arising from financial instruments, including specified minimum disclosures about credit risk, liquidity risk, and market risk. This standard is effective beginning in 2007, although early application is encouraged. IFRS 4 on *Insurance Contracts* will also affect disclosure by reinsurers within the EU in particular, inasmuch as it specifies disclosure about: the amounts in an entity's financial statements that arise from insurance contracts; and the amount, timing, and uncertainty of future cash flows from insurance contracts.

The Joint Forum

The report *Financial Disclosure in the Banking, Insurance and Securities Sectors: Issues and Analysis,* issued in May 2004, examines the progress made by financial firms in adopting the recommendations contained in the Fisher II report, issued in April 2001, and the efforts of regulators and other standard setters in the area of financial disclosure. The report notes that while firms have made good progress on enhancing financial disclosure, greater levels of disclosure are desirable.

The report on *Credit Risk Transfer* (CRT), issued in March 2005, recommends that market participants should continue to work to improve the quality of material public disclosures concerning CRT transactions and the resulting distribution of credit risks. The report notes that while disclosures of CRT-related risks need to respect the frameworks within which individual firms present their risk profiles, there is room for improvement in a number of areas, especially the following:

- Market participants should provide clear qualitative descriptions of the nature of their activities, including a discussion of the purpose and nature of CRT transactions employed.
- Market participants that engage in CRT transactions as part of their trading activities should consider providing breakdowns of trading risk exposure and revenue that report credit-related risks separately from other risk categories such as interest-rate risks (for example, disclose credit-related VaR separately).
- Market participants that report asset holdings by ratings categories should not simply aggregate holdings of collateralized debt obligations (CDOs) with holdings of other types of instruments that are similarly rated. Because of the differences in risk characteristics, it would be more appropriate to consider distinguishing material holdings by type of instrument (for example, bond and CDO) and/or to consider structuring reporting categories by spread levels.
- Market participants, such as insurers, that take on credit exposures as underwriters should consider providing information on the amount of such exposures and associated provisions.

Regulatory reporting in various countries

Reinsurers are required to issue regulatory reports to their supervisors, depending on the level of supervision and regulatory reporting requirements. The information provided to supervisors that is made public ranges from financial statements (balance sheet, profit and loss account, and an annex containing informative notes and data, such as the detailed list of investments) to the full list of regulatory reporting templates.

APPENDIX 7. Reinsurance Regulation in Major Centers

UNITED STATES

Insurance and reinsurance in the United States are both regulated at the state level by the state insurance agencies. The National Association of Insurance Commissioners (NAIC) assists in coordinating state regulation where possible and establishes minimum standards through its accreditation program. While some states have combined their insurance and banking regulation within a single agency, the oversight of these financial sectors is largely independent.[1]

There are currently two broad initiatives to introduce a federal element to insurance regulation in the United States. One proposal, known as the "SMART Act", would modernize the state system and create a framework for a national system of state-based regulation, based on uniform standards in such areas as market conduct, licensing, the filing of new products, and reinsurance. The other would create a dual chartering system similar to that in operation in the banking industry, allowing companies to choose between state and federal regulation.

To date, neither initiative has progressed very far. The SMART Act was introduced as a draft bill and circulated among interested parties in 2004. While a fair amount of media coverage ensued, no final bill was introduced. Bills espousing the dual charter option were introduced in Congress in 2003, but no hearings were held and no further action has been taken.

U.S. regulation of insurance focuses on legal entity solvency, as opposed to consolidated supervision and/or risk management. It is generally characterized as a "rules-oriented" approach, in contrast with the more "principles-oriented" approaches in several European countries. U.S. regulation centers on the ability of insurers to meet their contractual obligations to U.S. policy holders. A very important influence on that is the financial strength of reinsurers and their ability to meet their own obligations to primary companies. Although it is recognized that reinsurance transactions take place between sophisticated parties, solvency regulation of reinsurers is considered necessary. There is no explicit or implicit government safety net for reinsurers.

State insurance departments take a two-pronged approach to regulation of reinsurance: a direct approach for those reinsurers that are licensed in the United States, and an indirect approach for non-licensed reinsurers. Reinsurers that are licensed in the United States must meet all the regulatory and financial requirements that apply to primary insurance companies.

Reinsurers that are not licensed in the United States but that assume insurance risk from U.S. primary companies are not directly regulated. Instead, regulations are placed on the primary companies with which these reinsurers transact business. In particular, primary companies are permitted to take credit in their statutory financial statements for reinsurance ceded only to the extent that they hold collateral from these reinsurers. This regulatory approach recognizes the limited resources available to U.S. regulators to evaluate the financial strength of non-U.S. reinsurers, which are subject to varying degrees of regulatory oversight, as well as different accounting and capital regimes.

BERMUDA

Regulation of insurance operations in Bermuda is the responsibility of the Bermuda Monetary Authority (BMA). The approach to reinsurance regulation is broadly similar to that applying to direct insurance, based on ensuring that reinsurers have sufficient solvency and liquidity to meet claims. The same methodology is used to calculate solvency margins, which are based on the greater of a fixed percentage of either

1 In situations where a reinsurer affiliates with a bank under a financial holding company structure, the relevant Federal Reserve Bank serves as the consolidated supervisor.

premiums or loss reserves. These differ according to the class of insurance license under which a firm operates. There are five classes of license available in Bermuda, two of which – Classes 3 and 4 – have the most relevance for reinsurers. Class 3 covers third-party insurers and reinsurers writing more than 20% unrelated business. Class 4 covers highly capitalized writers of excess liability, property, catastrophe, and/or reinsurance.

The most significant professional reinsurance business is undertaken by companies in the Class 4 category. A Class 4 reinsurer that fails to maintain its solvency margin requirement is prohibited from declaring or paying dividends until the deficit has been made good. In addition, where a Class 4 reinsurer's statutory capital and surplus fall below US$75 million, the insurance legislation confers wide additional powers upon the supervisor.

On-site inspections of Class 4 companies, typically involving discussions with high-level personnel, are carried out by the BMA in conjunction with off-site reviews of both publicly available and privately requested company documents. The Insurance Division presents companies with a report detailing concerns and issues that may warrant corrective action.

While there are no collateral requirements for ceded reinsurance, Class 4 companies are limited in outward cessions to 25% of gross premiums written. Buyers of reinsurance and/or high excess insurance are considered to be sophisticated buyers; company managements are expected to manage reinsurance programs.

Most of the Class 4 companies licensed in Bermuda are publicly traded in the U.S. stock markets, and therefore file extensive financial disclosure statements with the U.S. Securities and Exchange Commission (SEC). Reinsurers present the SEC with consolidated financial statements (balance sheets, income statements, cash flow statements, and statements of changes in equity). In addition, SEC rules require comprehensive disclosure regarding the use of financial instruments. Further, publicly traded companies are required to provide "market risk" disclosures, both quantitative and qualitative, about all financial instruments presented "outside" the financial statements.

All Class 4 insurers are rated, whether they are publicly traded or not, by A.M. Best, Standard & Poor's, Moody's, and/or Fitch, to whom they submit extensive financial disclosure materials. The generally high level of financial security in Bermuda, coupled with very stringent solvency margin requirements, has allowed most Class 4 companies to achieve at least A ratings from the internationally recognized rating agencies.

SWITZERLAND

Current Law

In Switzerland, most requirements that apply to primary insurance companies have not been extended to reinsurance companies so far. The existing legislation provides that all insurance companies conducting business in Switzerland are subject to supervision, unless specifically exempted by it. Foreign reinsurers operating in Switzerland are one such exemption. However, authorization and supervision is required for Swiss reinsurers, who must complete an annual reporting package, including disclosures by lines of business. The annual reporting requirements for reinsurers are based on the same official forms used by primary insurers.

No solvency requirements are established under existing legislation, although supervisory procedures and industry practices effectively mandate a solvency margin of at least 20% of net earned premium (subject to a minimum of CHF 10 million). There are no fit and proper requirements and no consideration of probable maximum losses and maximum exposures. Nonetheless, the supervisory authority is empowered to intervene in cases of obvious mismanagement (incorrect accounting practices) or inadequate financial security (insufficient technical provisions).

Swiss insurance companies report the names of all relevant reinsurance providers to the regulator in the annual reporting package. While there are no requirements to provide the regulator with details of collateral or deposits and no restrictions on recognition of assets from ceded reinsurance (except for those inherent in the EU calculation of the solvency margin), a supervisory team visits the insurance company and discusses such subjects with management directly every four years or so.

Reinsurance groups are subject to supplementary group supervision, compatible with the current EU

regime on group supervision. This will also be the case under new legislation due to take effect in 2006 (see below).

New Law

The new Swiss Insurance Supervision Law (effective January 1, 2006) will strengthen the supervision of insurance. The new law is designed to protect the insured from abuses and the insolvency risks to which insurance companies are exposed. The law is worded very broadly. Details will be defined by secondary legislation, which is still in draft form.

Supervision under the new law will apply to insurers (both Swiss and foreign companies that operate in Switzerland), Swiss (but not foreign) reinsurers, and insurance groups and conglomerates. The legislation will include licensing requirements; principles for calculation of technical reserves; minimum capital requirements of between CHF 3 million and CHF 20 million; required use of internal models to calculate target capital, validated by the supervisory authority; and risk-based minimum solvency margin requirements.

GERMANY

The Insurance Directorate of the Bundesanstalt fűr Finanzdienstleistungsaufsicht (BaFin) has responsibility for ensuring compliance with solvency standards and monitoring the financial strength of the insurance industry in Germany. The German supervisory approach to reinsurance has undergone significant changes in recent years to strengthen regulatory oversight over reinsurers and bring the regulatory approach more into line with that of primary insurance companies. In particular, Germany adopted an amendment to its Insurance Supervision Law, effective December 2004, that anticipates and mirrors the key aspects of the EU Reinsurance Directive (see discussion below).

Reinsurers in Germany must be licensed and cannot carry on any other commercial business. BaFin has broad authority to take any appropriate and necessary measures to ensure that reinsurers comply with reinsurance laws and are able to meet the obligations arising from insurance contracts. They may impose fines for noncompliance, or even revoke licenses, if the infraction is severe enough.

German reinsurers are subject to solvency requirements. The solvency framework is similar to that which is applied to primary companies (and similar to the EU's Solvency I). Solvency calculations must take into account values of assets and liabilities as provided for by specific accounting rules. Both life and non-life reinsurers must maintain uncommitted assets equal to or in excess of a solvency margin calculated in accordance with the Capital Resources Regulation: the higher of 16% of premiums or 23% of claims in the life case (18% and 26% respectively in the non-life case). Insurance groups are subject to supplementary supervision under the Insurance Groups Directive and are required to calculate group solvency.

One of the major differences between the regulation of primary companies and reinsurance companies in Germany concerns investment rules. Primary insurers are subject to specific (quantitative) investment rules. By contrast, because of the international nature of reinsurance, reinsurers are subject only to general investment principles (such as security, profitability, and liquidity).

Supervisory authorities are not required by law to conduct examinations on a regular basis. However, BaFin may use its discretion on this, and in fact generally does carry out examinations. BaFin also has the authority to impose fines on reinsurers for not complying with requests for information and examination requirements, as well as for not reporting in the prescribed format and scope.

Foreign reinsurers are not subject to any kind of direct supervision, regardless of whether they provide cross-border services or services through a branch in Germany.

FRANCE

Insurance and reinsurance companies in France are supervised by the Commission de Controle des Assurances, des Mutuelles et Institutions de Prevoyance (CCAMIP). The CCAMIP ensures that companies are in a position to meet their underwriting liabilities. Primary insurers are subject to full direct supervision of their entire business, including licensing, minimum solvency, reporting, and investment limitation requirements (based on EU Directives). Currently, licensing and solvency requirements do not apply

to professional reinsurers, which are subject only to limited direct supervision. There are no supervisory requirements for branches of foreign reinsurers.

French-owned reinsurers can be subject to on-site inspections, like primary insurance companies. The same reporting requirements (financial statements, investments, claims development information, stress testing analyses, and the like) apply to reinsurers as to direct insurers.

It is the responsibility of the French supervisor to assess the adequacy of reinsurance programs of direct insurers on a case-by-case basis. In meeting this responsibility, the supervisor may examine the reinsurance program in detail during on-site audits of insurance companies.

A company's reinsurance recoverables are admitted in coverage of gross technical provisions only up to the amounts secured by collateral from the corresponding reinsurers (or cash deposits or letters of credit from banks, under specific conditions). The French insurance law includes prudential rules on the quality of collateral. Insurance companies also must check the financial heath of their reinsurers, as recommended by the OECD.

UNITED KINGDOM

The UK legislative framework for supervision makes little distinction between insurance and reinsurance businesses. The UK has supervised reinsurers in the same way and under the same regime as direct insurers since 1967. The regulation of both insurance and reinsurance businesses aims to assess the companies' ongoing ability to meet their obligations to policyholders (or in the case of reinsurers, to other insurers).

In particular, reinsurance companies are subject to on-site inspections and similar solvency requirements as primary insurers. However, there are differences in regulatory approach, recognizing the different nature of reinsurance. In addition to the standard regulatory reporting and solvency tests to which all UK-authorized insurance companies are subject, the regulator carries out certain additional checks on reinsurance companies. These principally involve looking at the reinsurer's solvency position under a number of different loss scenarios and estimating probable maximum losses, to assess the degree of risk inherent in the liability side of the balance sheet. Also, an attempt is made to rank reinsurers according to risk assessments made by the regulator based on its loss scenario testing.

This type of approach represents an attempt to recognize the additional risks posed by a reinsurer, as a result of the complexity of its business and the volatility inherent in its liabilities. With regard to the solvency position, there are two principal risks posed by claims provisions: first, the possibility that future claims in respect of existing contracts may exceed expected levels; and second, that claims already incurred but not settled may exceed amounts provided within liabilities. However, neither of these possibilities is explicitly dealt with by the current solvency margin methodology.

For professional reinsurers writing life business, the solvency margin calculation applies a different rate (0.1% rather than 0.3%) to capital at risk. Non-life reinsurance business is analyzed separately in the regulatory returns and is accounted for on an underwriting year basis rather than an accident year basis.

Firms must also meet regulatory capital requirements specified under the relevant EU Directive, as well as the key principle set out in the FSA Handbook for Financial Prudence that "a firm must maintain adequate financial resources". The UK does not differentiate between insurers and resinsurers for this purpose.

The EU requirement is based on the higher of a percentage of premiums or a percentage of claims, subject to a minimum. This amount is considered by the regulator to be too low for most firms. Firms are therefore required to make their own assessment of the capital needed, given the nature of the risks. The regulator then gives guidance to the firm as to the amount of capital the FSA considers it should hold. If the firm does not meet this level of capital, the regulator can restrict the amount of business the firm writes, or take other regulatory action. In addition, firms are required to report the result of a risk-based capital calculation with percentages applied to premiums, claims, and assets, with the percentages depending on the line of business. The firms are generally expected to explain how their own capital assessments differ from this risk-based calculation.

The supervisory approach to the Lloyd's market is somewhat different from that applicable to the rest of

the insurance market. In particular, Lloyd's operates a risk-based system and focuses its regulatory efforts on perceived high-risk areas. While the approach encompasses both insurance and reinsurance businesses, the emphasis on risk means that reinsurance businesses may be monitored more closely. Syndicates are required, for example, to produce realistic disaster scenarios, identifying their potential exposure to major losses. The regulator also requires routine actuarial reports from Lloyd's reinsurance companies.

The Lloyd's market is also subject to the EU capital requirements applicable to insurers and reinsurers (described above). Each member also must hold a level of capital as assessed by Lloyd's annually. Each managing agent is required to assess, for each of the syndicates, the amount of capital required to support the risks to which the syndicate is exposed. The level of capital is subject to the EU minimum and to regulatory review.

EUROPEAN UNION (EU)

The European Union has understood the need for more coordinated supervision of insurance companies (including reinsurers) and has adopted a number of initiatives, described briefly below.

Solvency I (in place)

Solvency I represents the first stage of a more fundamental review of a prudential regime for EU insurers, aimed at revising and updating the current EU solvency regime. Solvency I consists of two directives: 2002/83/EC for life insurers, and 2002/13/EC for non-life insurers. These directives raised the minimum solvency margins and extended the rights of intervention of insurance supervisors. Only certain jurisdictions applied Solvency I to reinsurers before the adoption of the EU Reinsurance Directive (see below).

Solvency II (in process; anticipated to become effective in 2011)

Solvency II is a continuation of the work initiated in Solvency I and will eventually replace it. Solvency II is commonly regarded as the insurance regulator's equivalent to Basel II. It will examine more sophisticated approaches to solvency, rules governing assets and liabilities, asset/liability matching, and the implications of accounting and actuarial policies. The objective is to better align solvency requirements to risk and to encourage insurers to improve their measurement and monitoring of these risks.

Solvency II is expected to create a consistent and harmonized risk-based insurance solvency system compatible with international developments in supervision and financial reporting and better matched to the true risks of insurance companies. Additional benefits include: simplified corporate structures, fewer collateral requirements, reduced regulatory arbitrage, and more consistent and detailed reporting.

The groundwork for Solvency II was conducted in two phases. The first phase examined the most important problems and specified the framework of the future supervisory architecture. The second phase spelled out the details of the system in two reports, carried out by KPMG and by the Conference of the Insurance Supervisory Services of the Member States of the European Union, under the chairmanship of Paul Sharma, Head of the Prudential Risk Department of the UK's Financial Services Authority (known as the "Sharma report).[2]

The KPMG report concluded that most European supervisory regimes did not sufficiently capture existing risks. It argued that risk management should not only capture insurance risks, but also asset/liability mismatches and operational risks. It proposed a three-pillar approach, involving quantitative minimum financial requirements, qualitative assessment of risk management, and principles of disclosure.

The Sharma report examined insurance and reinsurance insolvencies and "near misses". It concluded that the supervisory system should include legal tools to prevent and correct solvency problems at all stages. Capital requirements were only one tool and were insufficient to form the sole basis of a supervisory system.

2 See KPMG (2002), "International Insurance Insight: Solvency II Special Edition" and Conference of the Insurance Supervisory Services of the Member States of the European Union (2002), "Prudential Supervision of Insurance Undertakings". These documents are available at www.kpmg.com/Rut2000_prod/Documents/9/contents.pdf and www.fsa.gov.uk/pubs/occpapers/london_working_group_report.pdf respectively.

The next step in the Solvency II process is more technical and involves taking each risk in the new system into account.

EU REINSURANCE DIRECTIVE

Prior to the EU Reinsurance Directive, there was no legislation at the EU level covering the prudential regulation of pure reinsurance companies. With Solvency II so wide-ranging and distant, EU member-states and industry organizations believed that there was a need for rapid action to achieve tangible results in the short- to medium-term for reinsurance supervision and regulation. The EU Reinsurance Directive represents an interim measure that deals expressly with reinsurers. It is intended to create a single market in reinsurance, similar to that which already exists for direct insurance, and to remove remaining barriers to trade within the EU, such as collateral requirements imposed by supervisors.

The Directive was approved by the European Parliament on June 7, 2005 and adopted by the EU Council on November 7, 2005, after which member-states have two years to implement it. Member-states may also be granted an additional two-year grace period for compliance with the new solvency requirements. It is expected that the Solvency II project will build upon this Directive to a significant extent, with respect to some of its reinsurance initiatives.

The Directive features "fast-track" implementation of regulations based on the current prudential regime for primary insurers, bringing solvency and technical provisions requirements into line with those that apply to primary insurers, instituting a mandatory consistent licensing system across the EU, proposing "prudent person" investment guidelines, and abolishing collateralization requirements. The Directive brings all reinsurers within the scope of regulation, including captive reinsurers and reinsurance with limited transfer of risk (finite reinsurance).

The licensing regime requires the reinsurer to make a request for a license to the country where the head office is located. Once approved, the license would be granted for the entire European Union. The license requires the reinsurer to limit its business to reinsurance and related operations, submit a business plan, and be run by persons of good repute who have appropriate professional qualifications or experience.

Solvency margins for both life and non-life reinsurers will be based on the higher of a percentage of premiums (16-18%) and of claims (23–26%). For non-life reinsurers, this approach is the same as for non-life primary companies. There is an option that the solvency margins can be increased by 50% for certain classes of business by a decision by the Committee of European Insurance and Occupational Pensions Supervisors (CEIOPS). For life reinsurers, the approach adopted is different from that used for direct life companies (which is based on capital at risk) and recognizes differences in the mix of business in these sectors. In particular, the approach adopted for life reinsurers is based on the approach used for primary non-life business, which is viewed as more appropriate for the protection business underwritten by life reinsurers.

Investment guidelines are characterized as a "prudent-man plus" approach. Although consisting predominantly of general guidelines, a few quantitative limitations are specified, but these are optional. For example, the Directive indicates that assets supporting technical provisions must take into account the nature, amount, and duration of expected claims and must be diversified. Assets not traded on a financial market must be kept to prudent levels. Although the Directive notes that member-states shall not require reinsurers to invest in particular categories of assets, it provides member-states the option of imposing certain quantitative rules, including: a 30% limit on investments in currencies other than those in which technical provisions are set; a 30% limit on investments in non-listed securities; a 5% limit on investments in the same company; and a 10% limit on investments in the same group.

The EU Reinsurance Directive will provide the basis for mutual recognition of supervision among EU member-states. The financial supervision of foreign EU branches of a parent reinsurance company would be assigned to the supervisory authority of that parent company. This concept can also be labeled the "small lead supervisor", because it applies to branches but not subsidiaries. In the future, the industry favors

a system where the financial supervision of the lead supervisor also covers EU subsidiaries.

The implications of the Reinsurance Directive for non-EU reinsurers are uncertain. The Directive instructs member-states not to apply a more favorable treatment to non-EU reinsurers than that applied to domestic reinsurers. Member-states may use different approaches to implement this. For example, they may apply direct supervision to non-EU reinsurers, require collateral, or apply an "equivalence test" to the relevant supervisory rules of a non-EU jurisdiction.

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