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BASEL COMMITTEE ON BANKING SUPERVISION
INTERNATIONAL ORGANIZATION OF SECURITIES COMMISSIONS
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RISK MANAGEMENT PRACTICES AND REGULATORY CAPITAL

CROSS-SECTORAL COMPARISON

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Risk Management Practices and Regulatory Capital

Executive Summary

The Joint Forum of banking, securities, and insurance supervisors has been working to enhance mutual understanding of issues related to the supervision of firms operating in each of the respective sectors. These efforts reflect the development of financial conglomerates, the increasing globalization of financial markets and the development of new financial instruments. This report responds to the parent committees' request to compare approaches to risk management and capital regulation across the three sectors and was developed by a working group of the Joint Forum with membership from supervisors in all three sectors (see annex 6). In preparing this report, the working group has drawn on interviews with market participants, rating agencies and analysts, as well as on its own experience. The report was completed in Tendo, Japan, in July 2001 and was updated after consultation with the parent Committees in August 2001.

It has been found that while there is convergence between the sectors in various respects, there still remain significant differences in the core business activities and the risk management tools that are applied to these activities. There are also significant differences in the regulatory capital frameworks, in many cases reflecting differences in the underlying businesses and in supervisory approaches.

1. Differences in the core business activities

Sectoral differences in core business activities and risk exposures are well reflected in the balance sheets typical of firms within each sector. In order to illustrate such differences, stylised balance sheets for institutions from each sector are presented in Annex 2 of the report for explanatory purposes. These stylised balance sheets suggest the following broad patterns.

The majority of a bank's assets typically consist of loans and other credit exposures, while the majority of liabilities consist of deposits payable on demand and other short-term liabilities. In addition, many banks are exposed to substantial credit risks associated with lines of credits and commitments that are not directly reflected on the balance sheet. As a result, the primary risks typically faced by banks are credit risks from their lending activities and funding liquidity risk related to the structure of their balance sheets, which often contain significant amounts of short-term liabilities and relatively illiquid assets.

Securities firm balance sheets primarily reflect securities portfolios and securities financing arrangements. For example, the stylised balance sheet included in Annex 2 suggests that the majority of assets for securities firms are fully collateralized receivables arising from securities borrowed and reverse repurchase transactions with other non-retail market participants. The next greatest asset category is securities owned by the firm at fair value, which includes positions related to derivative transactions. Customer receivables tend to make up less than a quarter of assets, and these are typically fully secured, often with substantial margins of over-collateralization. On the liability side, the largest items are payables to retail customers (principally related to customer short positions) and obligations arising from selling financial instruments short. The latter item includes payables related to derivative contracts. In addition, about 20 percent of the liabilities are short and long-term unsecured borrowings. As a result, the primary risks faced by securities firms are the market and liquidity risks associated with the price movements of their proprietary securities positions and of the collateral they have obtained or provided.

The balance sheets of life and non-life insurance companies reflect the importance of technical (insurance underwriting) risks for insurance firms. Life insurance companies typically have the greater part of their liabilities taken up by technical provisions, in some jurisdictions more than 80 percent. This reflects the amount that the firm is setting aside to pay potential claims on the policies that it has written. Correspondingly, more than 90 percent of the assets of life insurance companies comprise the investment portfolio held to support these liabilities. The dominant risks for a life insurance company are whether its calculations of the necessary technical provisions turn out to be adequate and whether the investment portfolio will generate sufficient returns to support the necessary provisions.

For a non-life insurer, the key difference is that, although technical provisions also represent the main category of liabilities, they represent a somewhat lower proportion of liabilities, while capital makes up between one-fifth to two-fifth of liabilities (as opposed to only a few percent for life insurers).¹ The different balance between technical provisions and capital for non-life insurance companies compared to life insurance companies reflect the greater uncertainty of non-life claims. The need for an additional buffer for risk over and above the technical provisions accounts for the larger relative share of capital in non-life insurance companies' balance sheets.

2. Similarities and differences in risk management tools

The assessment and management of risks, which is a priority for firms in all three sectors, are handled in ways that reflect both similarities and differences between sectors. In all sectors, policies and procedures exist to ensure that an independent assessment of risks occurs and that controls are in place to limit the amount of risk that can be taken on by individual business areas. The priority placed on risk management is also reflected in substantial efforts taken across all sectors to develop quantitative measures of risk, including risks – such as operational risk – that are significantly difficult to measure.

Continuing pressures to deliver strong and sustainable risk-adjusted returns on capital motivate financial firms in all sectors to invest in improved methodologies for quantifying risk. The emphasis on risk measurement can be related to efforts to manage significant risks through hedging or holding capital and/or provisions. Because such measures and risk mitigation techniques are costly, a better understanding of what risks should be hedged as well as how much capital and/or provisions are truly needed to support their retained risk would tend to improve the firms' risk-adjusted returns.

Notwithstanding these broad similarities, there are significant differences reflecting the different business activities and risk exposures in each sector. Firms naturally tend to invest more in developing risk management techniques for the risks that are dominant in their business. Therefore, risk management will often be more specialised and sophisticated for the primary risks in that sector than would be the case for management of the same risk in another sector where it is a more secondary risk. Reflecting the balance-sheet characteristics described above, securities firms focus most heavily on the market and liquidity risks associated with their activities. Hedging techniques and capital play dominant roles in their strategies for the management of these risks, and they frequently build on quantitative value-

¹ These ranges reflect essentially differences in the structure of insurance companies' balance sheet between jurisdictions. This however does not alter the fact that (1) technical provisions are generally the main component of an insurance company's liabilities and (2) non-life insurance companies tend to rely to a greater extent on capital than life insurance companies because the greater uncertainty of their claims generally requires a higher capital buffer over and above the technical provisions. For further detail on the respective proportions of capital to total assets for insurance companies across jurisdictions, see Annex 2 of this report.

at-risk and stress testing methodologies. Typically, such firms attempt to reduce the amount of credit risk they take by requiring collateral and closely monitoring the size of exposures relative to collateral. In recent years, credit risk has become a major concern as the firms have become involved in over-the-counter derivative transactions.

For banks, on the other hand, taking on credit exposure is a defining element of their business, and risk management of lending activities is their major challenge. Banking risk management practices are currently undergoing a significant transformation, entailing a greater emphasis on the systematic assessment of the quality of all credits and the production of detailed quantitative estimates of credit risk. These quantitative measures are being used by banks to inform their internal estimates of the amount of provisions and capital necessary to support these risks. In addition, the increasing use of quantitative credit risk measures is helping to spawn a large and growing market for the trading and hedging of credit risk exposures.

In the insurance sector, technical provisions play a very important role in the risk management of the firm. Quantitative (actuarial) techniques are used to calculate and/or check the size of the necessary technical provisions and are common in all but the smallest and least sophisticated firms. Risk limiting and sharing via reinsurance contracts is also an important and well-developed part of the insurance sector. Investment risks borne by insurance firms have traditionally been managed by imposing constraints on the type and size of investments and by seeking to address the risk arising from any mismatch of the maturity of investments with the maturity of liabilities. Firms in some jurisdictions have limited these risks by limiting the scope of guaranteed fixed returns and through the sale of variable-return products.

The emphasis that firms in all three sectors are placing on risk management and risk measurement issues is encouraging. This should result in stronger and better managed firms. The ability to improve risk quantification can provide important tools for assessing risk/return trade-offs and encourage sound risk management practices. However, firms need to understand the limitations of such methodologies and should supplement these where necessary, for example through stress testing.

As firms become active participants in new markets and take on new types of risks, it is important that appropriate policies and procedures be put into place to measure and manage these risks and that their risk management practices are appropriate to the level of activity that they are undertaking. In particular, firms should focus on the need to hold capital to support new activities and should be able to support their judgements of the necessary capital by comprehensive assessments of the relevant risks that are independent of the relevant operational business units. Clearly, senior levels of the firm should approve significant expansions of a firm's activity into new risk areas.

As financial groups become more integrated and undertake a wider range of business activities, fully consolidated risk measurement and risk management spanning multiple risk categories and business lines has become the ultimate objective for many firms. Accordingly, firms in all sectors are seeking to develop better methodologies for quantifying the relationships between disparate risks. These techniques are generally in their early stages. Nevertheless, a growing amount of cross-sectoral risk transfer is increasing the interest in such techniques for a broader set of firms.

It is currently not clear to what extent a firm can obtain risk diversification by being active in each of the banking, securities, and insurance sectors. To some degree, measures that attempt to assess the magnitude of such diversification face significant obstacles, given the differing time horizons and the lack of sufficiently rich data to adequately measure the correlations between these businesses. Nevertheless, given the efforts that are being made

to refine such estimates, it is likely that an increasing number of business decisions will be influenced by assessments of the degree of risk diversification across the activities of the three sectors.

The Joint Forum supports continued efforts by firms to further develop such methodologies in spite of the difficulties associated with both the need to reconcile differing time horizons for risk assessment and the measurement of diversification benefits. However, it should be noted the potential for excessive optimism when making simplifying assumptions in the calculation of risk measures that span multiple categories of risk. In the absence of precise data, it may be tempting for firms to assume significant amounts of diversification benefits, rather than take a conservative approach. Firms should therefore evaluate such simplifying assumptions carefully, particularly their potential validity during stressful scenarios.

The emphasis on risk management within firms should ideally be complemented by a focus on the quality of a firm's risk management by market analysts, rating agencies, and the firm's counterparties. Market discipline is a key tool for helping to ensure that firms devote appropriate resources to risk management issues and that emerging risk concerns are promptly identified. Accordingly, initiatives to develop meaningful, comparable disclosures that allow market analysts and others an improved ability to evaluate the quality of a firm's risk management should be supported. The findings included in the report of the Multidisciplinary Working Group on Enhanced Disclosure, sponsored in part by the parent committees of the Joint Forum, should be supported.

Supervisory emphasis on the importance of risk management is also clearly beneficial. The efforts that supervisors have made to highlight appropriate practices, policies, and procedures in regard to various risks is desirable and helps to increase the rate at which effective risk management approaches are adopted across all industries as well as industry-wide within a sector. Looking forward, supervisors should seek to understand (1) how firms may be assessing those risks that are traditionally less common in their sector than in other sectors, and (2) the methodologies that firms are developing to provide a consolidated firm-wide view of risk that spans multiple risk categories. In this regard, cross-sectoral supervisory cooperation and information sharing is critical to ensuring that supervisors in the different sectors have a sound understanding of how risk management practices may differ and where improvements may be needed.

3. Approaches to capital regulation

Turning to the issues related to capital regulation, the primary approaches in place in the three sectors were reviewed and discussed. These approaches reflect underlying differences in the time horizons most appropriate to the risks in each sector, as well as differences in supervisory objectives and emphasis. A particularly important issue is the different emphasis on capital relative to provisions or reserves across the three sectors, which largely reflects underlying differences in the businesses.

As already mentioned, technical provisions for insurance companies perform the role of providing an estimate of foreseeable claims (policy benefits). Securities firms, on the other hand, generally do not maintain reserves because assets and contractual obligations can generally be valued accurately on a mark-to-market basis, and there should be no expected losses if market prices fully reflect current information. Capital therefore serves as the primary cushion against losses in the securities sector. Banks hold both loan loss reserves to cover foreseeable losses and capital to cover unanticipated credit losses. Bank capital is generally a larger share of the balance sheet than loan loss reserves.

Reflecting the underlying differences in starting points, the specific capital regulation or solvency regime frameworks are themselves quite distinct. For banks, the dominant

approach is based on the Basel Accord. There are two main approaches for securities firms: (1) the Net Capital approach, which is used in the United States, Canada, Japan, and other non-EU jurisdictions and (2) the EU Capital Adequacy Directive, based on the Basel Accord Amendment for market risks. There are also two primary frameworks for insurance companies: (1) the Risk-Based-Capital (RBC) framework, used in the United States, Canada, Japan, Australia and other countries, and (2) the index based solvency regime that is used throughout the EU but also in a number of other jurisdictions.

Perhaps most important, the different requirements of accounting conventions, such as the requirement that assets be marked-to-market (that is common for securities firms) as compared to the historical cost approach typically applied for banks and the variety of different approaches applied by insurance firms make it very difficult to undertake clear comparisons between regulatory capital frameworks. It is important to note, however, that the present report does not take a position on the desirability of harmonising these accounting frameworks since a number of issues related to such proposals fall outside the scope of the discussions.

Additional differences in the capital frameworks are apparent in the definition of eligible capital, the charges applied to individual risks, the aggregation methodologies of these charges, and the scope of application of the framework (to individual firms, groups of firms or consolidated groups). The important differences in the relative roles of capital and provisions across the sectors also make it difficult to compare these details on an equivalent basis.

In addition, evidence suggests that there may be significant differences across the sectors in the typical relationship between the actual capital held by firms and the minimum capital requirements. For example, it appears almost universal for large insurance companies to operate with actual capital amounts several times the minimum required level, while large banks and securities firms usually hold no more than 150% of their capital requirement. To the extent that differences in the ratio of actual to required capital embed a different and well-established relationship between minimum requirements and what is expected by rating agencies, market analysts, supervisors and the firms themselves in each sector, it may be particularly misleading to focus solely on the level of minimum requirements in comparing specific elements of each framework.

For all of these reasons, comparisons of individual elements of the different capital frameworks are potentially inappropriate and misleading. Moreover, adjustments to establish an equivalent basis for comparison would be very difficult and involve a variety of subjective assumptions. In essence, the frameworks and underlying accounting are different in so many respects that it is not possible to draw firm conclusions about specific elements or about the relative conservatism of the frameworks overall.

4. Cross-sectoral risk transfers and investments

Considerations were made to the implications of differences in the underlying capital frameworks for cross-sectoral risk transfers and for the treatment of cross-sectoral investments. In regard to cross-sectoral risk transfers, it is clear that differences in the frameworks may imply different marginal capital requirements for specific types of instruments. In this context, it is important to separate the perspective of the transferor from the perspective of the transferee. Transferors typically seek to transfer risks that they take on as a part or a consequence of their core business activities. Their incentives to transfer risks will depend on a variety of factors, including the cost of transferring or hedging the risk relative to the cost of retaining the risk on their own balance sheet. The regulatory capital treatment of risk can obviously influence the cost of retaining risk, particularly if the regulatory capital cost is above what the firm believes is the appropriate amount of economic capital to

hold against the risk. In this fashion, regulatory capital requirements can create incentives for well-managed firms to transfer risks outside their sector.

From the perspective of the transferee, the key factors in determining whether to accept a given risk will include an evaluation of the underlying risk-return trade off, consistency with overall business strategies, the existence of legal or regulatory barriers to taking on the risk, and particular accounting and/or tax implications. Clearly, if regulatory capital requirements on the risks are high relative to the firm's own calculations of risk and the accounting and tax costs associated with bearing the risk, then the firm may choose not to accept various risks. However if the risk is not subject to regulatory capital requirements or such requirements are lenient, it is not clear that such a firm will automatically have an incentive to take on the relevant risk. If the firm is well managed and evaluates risks prudently, then it will ensure that it has the appropriate risk management systems to adequately measure the risk and appropriate economic capital to support the risk, even if regulatory capital standards are low. On the other hand, if the firm's internal assessment underestimates the risk, then it may see the lack of robust capital requirements as an additional opportunity to boost return on equity.

In other words, for the "transferees" to take on new non-traditional risks, the risk/return trade off must be perceived to be attractive, regardless of the regulatory capital treatment. This can occur either because the firm is measuring the risk correctly and the trade off truly is attractive or because the firm is underestimating the true risk.

This suggests there is a need to seek to ensure that firms in the various sectors are taking a prudent approach to the management of risks that they are taking on from other sectors. Consistent with this conclusion is the increasing need for supervisors in the different sectors to share information on risk management practices and techniques. Such arrangements can help alert supervisors to particular vulnerabilities related to risks with which they are less familiar and help supervisors to develop appropriate monitoring regimes as firms increase the degree of cross-sectoral risk transfer.

A particularly important instance of cross-sectoral risk transfer can occur when the transferor and the transferee are separate legal entities of the same conglomerate firm. It is natural for such firms to conduct an analysis of the costs and benefits of booking transactions in various legal entities. Key factors in such an analysis are legal and tax considerations, accounting conventions, and regulatory requirements. Since a firm in this position has already decided to take on the relevant risk, the potential for different regulatory capital treatment may create an incentive to book transactions in one vehicle rather than in another. For this reason, incentives to engage in regulatory capital arbitrage may be more important in their effects within firms than across firms.

The growth in cross-sectoral risk transfers may also reflect the increasing interest in quantitative measures of risk and economic capital. To the extent that such measures demonstrate the potential for diversification benefits through the acquisition of risk types beyond those traditionally held in the sector, firms may be encouraged to explore participation in these activities.

Similar incentives may be at work in the trend toward greater cross-sectoral investments and conglomerate formation. Naturally, such changes also may reflect views about the potential benefits of cross-selling products from the different sectors as well as changing regulatory restrictions in some jurisdictions. Several different approaches to the capital treatment of cross-sectoral holdings are possible. The major alternatives in this regard were reviewed and the conditions analysed under which particular approaches may result in more stringent treatments than the others.

Broadly speaking, it is not possible to say that any particular approach to the treatment of cross-sectoral investments is always more or less conservative than the others. In general the relative stringency of the treatments will depend on the types of activity conducted in the subsidiary, whether these activities receive a higher or lower capital charge under the rules of the parent's or the subsidiary's sector, and the ratios of actual capital to required capital for both the parent and the subsidiary on a solo basis. From a supervisory perspective, the goal should be to ensure that the methods chosen appropriately address issues of double or multiple leverage and provide a group-wide view of risk.

The use of the so-called Joint Forum approaches to the aggregation of risk and capital, which address these issues, are now being adopted more widely in the context of conglomerates and cross-sectoral investments. However, the differences in the sectoral capital frameworks that this report identifies make it important that supervisors and market analysts interpret the capital adequacy measures ratios resulting from application of the Joint Forum approaches carefully. In particular these capital adequacy measures will not have the same properties as measures from any of the individual sectors, but will have a hybrid character that will need to be taken into account by analysts that monitor conglomerates on the basis of such capital adequacy measures.

In regard to the future development of capital regulations, the Joint Forum emphasises the need for supervisors to evaluate sectoral capital regulations in light of the degree of convergence that is occurring between the sectors. Clearly, some convergence is occurring in the form of cross-sectoral risk transfer, cross-sectoral investments, and full-fledged conglomerates. However, it is not clear how fast such convergence is proceeding, and there remain very significant differences in the business activities of firms in the different sectors. These differences support the desirability of sectoral capital regulations that have the flexibility to respond to the specific needs of each sector. Moreover, in the current environment, the existence of multiple frameworks allows greater opportunity for innovations in the approaches to capital regulation to be considered and tested.

This does not imply that supervisors can ignore convergence. As supervisors evaluate the extent of cross-sectoral activity, it may become important for the individual sectoral frameworks to be updated to better reflect the contemporary risk profiles of the firms subject to those frameworks. It would not be surprising, for example, for some jurisdictions in the near future to consider greater convergence in the frameworks applied to the different sectors.

5. Developments on the horizon

Looking ahead, there are several emerging trends and developments that are likely to impact on the issues that have been the focus of this report. The progression of these developments likely will have a significant influence on how long the preceding conclusions remain valid or whether sufficient changes will occur to require another look at the relative approaches to capital regulation.

The first set of developments relates to changes in the strategies of financial firms, including the degree to which conglomerate mergers and other forms of cross-sectoral activity will be encouraged by underlying economic trends and developments in technology. Clearly, the continuing development of risk management methodologies and the emphasis on quantitative risk measurement techniques will continue to play a significant role in influencing the approaches that firms take and the benefits they perceive from diversifying across sectors. The likely evolution of more liquid and more transparent markets for the transfer of all forms of risk will support these developments.

Changes in the supervisory and regulatory environment are also likely to have important implications. These include potential changes in accounting conventions and the increased degree of cooperation between supervisors in the different sectors. Important developments in capital regulations, such as EU efforts to develop supplementary capital regulations for conglomerate firms, will help provide evidence on the benefits and costs of different approaches. A particularly important change is the revision of the Basel Accord, which seeks to achieve substantial risk sensitivity through reliance on banks' internal estimates of risk. The success of this effort to more closely link measures of regulatory capital with measures of economic capital will clearly have substantial implications for the future of capital regulation.

In summary, approaches to risk management and capital are likely to continue evolving rapidly for the foreseeable future. Against this background, supervisors will be confronted with a fundamental tension in the years ahead. Sectoral approaches to capital regulation will reflect the traditional business activities and perspectives within each sector and thus remain quite different from one another. Nevertheless, it is clear that some convergence between the sectors is currently occurring, which may or may not gather pace in the foreseeable future. To the extent that the degree of convergence increases, supervisors will increasingly need to reevaluate their sectoral regimes for capital and provisions to ensure that they provide an appropriate means of evaluating the capital held by firms in relation to their activities. In this context, the Joint Forum remains committed to providing a mechanism for enhancing the mutual understanding and cooperation among supervisors that will be necessary in addressing these challenges.

I. Introduction

In response to the development of financial conglomerates, as well as the increasing globalisation of financial markets, the development of new financial instruments and other trends, the Joint Forum of banking, securities, and insurance supervisors has been working to enhance mutual understanding of issues related to the supervision of firms operating in each of the respective sectors. The current report responds to a request by the parent committees to compare approaches to risk management and capital across the three sectors and is based on the work of a working group of the Joint Forum with membership from supervisors in all three sectors.

In putting together its report, the working group has drawn on interviews with market participants and analysts, as well as its own experience. Broadly speaking, while there is convergence between the sectors in various respects, there still remain significant differences in the core business activities and the risk management tools that are applied to these activities. There are also significant differences in the regulatory capital frameworks, in many cases reflecting differences in the underlying businesses and in supervisory approaches.

On the one hand, there is clearly some convergence in the nature of the risk exposure and in the risk management approaches across the sectors. In particular, an increasing emphasis on risk measurement and its role in efficient capital allocation within the firm are common to all three sectors. On the other hand, it would be easy to exaggerate the extent and pace of convergence between the banking, securities, and insurance businesses. For example, most firms, including conglomerates, continue to see and manage these activities as separate lines of business with many sector-specific features. Likewise, rating agencies and market analysts still tend to view the sectors separately.

The report concentrates first on issues related to risk management, including discussion of how firms within each sector address key risks as well as how the marketplace and the firms themselves seek to assess the quality of their risk management. The following section of the report compares the supervisory framework within each sector, with a particular emphasis on capital regulations. This section also addresses the implications of differences in the capital frameworks for cross-sectoral risk transfers and cross-sectoral investments. The final section of the report outlines conclusions and discusses future developments likely to have an influence on the issues focused on in the report.

Annexes to the paper include (1) a glossary of key terms, as comparisons can be easily obscured by the different meanings/usage of central terms in different sectors, (2) stylised balance sheets that attempt to reflect key differences in the asset and liability structure of firms in the different sectors, (3) a summary of the approaches to the calculation of technical provisions used in the insurance sector, (4) brief outlines of the main capital frameworks within each sector, as well as a listing of information sources where more detailed descriptions of the frameworks are available, and (5) a summary of national rules on the capital treatment of cross-sectoral investments.

This report is addressed to a wide audience. It is intended that national supervisors in each of the three sectors may find it useful for better understanding approaches to risk management and capital in other sectors and (to a lesser extent) the same sector in other countries. It is hoped that market participants may also find it useful for the same reasons. As with other reports from the Joint Forum, this report is being issued initially in draft form for comment and feedback.

II. Risk Management

Firms and supervisors in the three sectors place different emphases on the various risks facing financial firms. In discussing approaches to risk management across the sectors, it would be possible to organise the discussion primarily by sector or alternatively by risk type. Because of differences in terminology and definition, neither approach is ideal. Therefore, the report first describes the major sectoral emphases on particular risks and then discusses the key risks in turn. In discussing risk management techniques, the major focus is on the key risks faced by each sector.

Sectoral emphases on risk

One of the primary concerns of any supervisor or regulator is that supervised institutions are able to meet their financial promises to customers as and when they fall due. However, the nature of these promises can differ greatly: from obligations to repay fixed amounts of deposits and other borrowings along with interest calculated at a pre-determined rate (as is common in banking and securities firms), to obligations to make payments in which the rate of return involved is determined by the performance of financial markets (such as a unit-linked life insurance product), to obligations in which the contractual payments are contingent on some future event (for example, under a general insurance policy). Because the nature of these financial promises differ, the risks which might cause a supervised institution to be unable to meet its financial obligations can arise from quite different sources.

In describing the major risks and business activities of the three sectors, it was found helpful to consider stylised balance sheets for each sector. These are shown in Annex 2 of the report. Separate balance sheets are described for a bank, a securities firm, a life insurance firm, and a property and casualty (P&C) insurance firm. These balance sheets were constructed by supervisory representatives from each sector for illustrative purposes only. While they attempt to reflect a typical balance sheet, they are not intended to provide a precise aggregate balance sheet for the sector nor do they reflect any particular firm.

Banking sector

Credit risk has long been identified as the dominant risk for banking firms and is an inherent part of their core lending business. Loans extended to customers and customer deposits generally represent, respectively, the most significant asset and liabilities classes of a bank's balance sheet. This is reflected in the stylised bank balance sheet shown in Annex 2. In this case, loans make up approximately two-thirds of the assets. For most banks, loans will make up between 25 percent and 75 percent of total assets, although there are some exceptions. Loan loss reserves are shown on the stylised balance sheet as a contra-asset item, reflecting their treatment in a number of jurisdictions. Such reserves can range from less than one percent of loans outstanding to much larger amounts in some cases.

An important off-balance-sheet source of credit risk for many banks relates to their provision of lines of credit and other forms of lending commitments. For many banks, these loan commitments are half again as large as their total assets, although naturally there is a wide range of variation across banks. This further underscores the continuing importance of credit risk as the primary risk for the majority of banks.

Interbank activities, securities holdings, and other traded assets tend to make up the bulk of a bank's assets not devoted to customer loans. The share of these types of assets may be larger than 25 percent for banks that are more active in money market and other trading activities. Depending on the size and scale of these activities, banks are exposed to market risks, including foreign exchange risk, interest rate risk, and other risks associated with

holding traded securities. Similarly, banks have in many cases become significant users of derivative instruments. For most banks, the notional value of derivative contracts outstanding is less than 10 percent of assets, but for those banks that act as dealers, it can exceed 10 times total assets. Of course, notional value is not a good measure of exposure. Even for the largest dealer banks, derivative-related credit exposure tends to make up considerably less than half of all loan-related exposure and a significant portion of such exposure may be collateralized.

On the liability side, the stylised balance sheet suggests that customer deposits remain the largest source of bank funding. Such deposits still represent more than half of all liabilities for many banks, although a trend towards other forms of funding has been apparent in a number of countries. Interbank liabilities and other forms of short-term wholesale funding are also important, particularly for banks active in trading activities. Importantly, the structure of bank's liabilities relative to its assets can give rise to both funding liquidity risks and to interest rate risk if the underlying maturity of a bank's assets and liabilities do not match.

Capital issued by the bank tends to make up between 5 and 15 percent of assets depending on the bank and on how capital is defined. For example, for the bank shown on the stylised balance sheet, equity capital makes up 5.5 percent of assets, while subordinated debt eligible for regulatory capital makes up another 4.5 percent.

In considering the activities that banks are substantially engaged in, it is also important to mention that many banks have increasingly been seeking opportunities to earn fees from customers without taking substantial assets onto the balance sheet. Examples of fee-based businesses include asset management, advisory, payments and settlement, and other processing-related businesses. While such business lines typically do not result in the acquisition of substantial assets or in substantial credit exposure, they often contain important elements of operations-related risks.

Securities sector

Securities firms² also bear risks as an ongoing part of their business activities, but the stylised balance sheet for a securities firm shown in Annex 2 makes clear that the nature of these risks is somewhat different than for banks. For securities firms, the majority of assets are receivables fully secured by securities. These receivables are either related to financing arrangements (i.e. securities borrowed and reverse repurchase transactions) with other non-retail market participants or to margin loans made to retail customers. Generally, the former is 100% collateralized, while the latter are collateralized well in excess of 100%. The next largest asset category for securities firms is financial instruments owned at market value.

In other words, securities firm balance sheets tend to reflect relatively little unsecured credit exposure (roughly ten percent of assets). As with banks, many securities firms are active participants in derivative markets where both market and credit risk may be present.

On the liability side of the balance sheet, the largest item are generally payables to customers (largely arising from customer short positions) and obligations arising from selling securities short. In addition, securities firms tend to rely on wholesale funding sources such

² The descriptions here focus primarily on those firms that are active securities market participants. They may be less relevant to firms engaged primarily in futures trading. In addition, the analysis tends to focus on the characteristics of the largest securities firms, many of which are based in the US. Therefore, the descriptions may not be applicable to all securities firms in all jurisdictions.

as securities loaned and repurchase transactions to finance part of their proprietary and customers' securities positions. Most of the risk in a securities firm balance sheet derives from the differential price sensitivity and liquidity characteristics of the different long and short positions.

The maintenance of a large and actively managed securities portfolio is critical to a number of business lines in which securities firms engage, including investment banking, brokerage, and proprietary trading. In addition, similar to banks, securities firms also engage in fee-driven activities such as asset management, advisory and research services, and trade processing. Operational risks form a key risk for such activities.

Securities firms issue debt and maintain capital as a means to protect against risk. As the stylised balance sheet suggests, equity capital makes up approximately 5 percent of the firm's liabilities, with long-term debt frequently making up 10 percent and short-term debt another 10 percent of total liabilities.

Insurance sector

Risk bearing is at the core of the insurance business. A standard breakdown of risks in the insurance sector is to divide them into three categories: (1) technical risks (2) investment risks, (3) other non-technical risks. Insurance underwriting risks are frequently referred to as technical risks. Investment risks include the potential loss in the value of investments made by the insurance firm and therefore include credit risk as well as market risk (and interest rate risk within that category) and liquidity risk. Non-technical risks include operational risks.

The stylised balance sheets for life and non-life insurance companies presented in Annex 2 demonstrate the importance of technical risks for insurance firms. Around 80 percent of the liabilities of the life insurance company are made up by technical provisions which reflect the amount that the firm is setting aside to pay potential claims on the policies that it has written. Correspondingly, more than 90 percent of the assets of the life insurance company reflects the investment portfolio held. Capital makes up less than two percent of liabilities for the stylised life insurance company balance sheet.³

These figures illustrate the nature of the life insurance business. Policyholders pay premiums to the company over the life of the policy. These premiums are invested in a variety of assets over long periods to generate returns while the company also calculates the potential future amounts that policyholders could claim under the terms of the contract (i.e., the technical provisions). Thus, the dominant risk for the insurance company is whether its calculations of the necessary technical provisions prove adequate. In addition, the insurance company faces the risk that its investment portfolio could decline in value or fail to generate returns adequate to meet any guarantees that are embedded in its life insurance policies.

Annex 2 shows also the stylised balance sheet for a non-life insurance company. Here the key difference is that the technical provisions represent a lower but nonetheless major proportion of the liabilities (in this case about 60% of liabilities), while capital makes up close to 20% of liabilities. The precise percentages may vary between jurisdictions and reflect differences in accounting standards and supervisory frameworks. However, in all cases technical provisions constitute the major proportion of liabilities. The difference in the size of technical provisions relative to capital for non-life insurance companies largely reflects the

³ The percentage of capital to total liabilities tends to vary between jurisdictions. For an example of this, see Annex 2.

greater potential uncertainty associated with non-life insurance claims relative to life insurance claims. In other words, while the potential claim experience for life insurance policies can be estimated with a reasonable amount of statistical assurance, non-life insurance claims are less predictable. The need for a significant additional buffer over and above the technical provisions accounts for the larger relative share of capital in non-life insurance firms' balance sheets. All insurance companies are required to build adequate technical provisions. Importantly, however, capital is intended to provide a buffer for losses not captured in the technical provisions for both life and non-life insurance companies.

General approaches to the management of key risks

There are a number of basic risk management tools that firms in all three sectors use to manage risks. These include the development of appropriate corporate policies and procedures, the use of quantitative methods to measure risk, pricing products and services according to their risks, the establishment of risk limits, active management of risk through diversification and hedging techniques, and the building of cushions (both reserves/provisions and capital) to absorb losses. The relative emphasis and application of these tools differs both across sectors and across risks, to some extent depending on the nature of the relevant supervisory regime.

Firms set policies and procedures identifying acceptable risks and desirable risk management techniques as an integral part of their ongoing risk management process. The objectives, scope and contents of firm-wide policies and the associated approaches to implementation are largely similar for all firms. For example, it is common for firm-wide risk policies to be set or approved by the senior levels of the firm. The primary aim of firm-wide risk policies is to set the firm's appetite for taking on various risks and to establish approaches for their measurement and management. Assessments of the potential likelihood and magnitude of the major categories of risk are typically undertaken prior to establishing risk tolerance levels.

Firm-wide risk policies, by determining the principles that govern the firm's risk exposures, allow for a conscious, deliberate and consistent risk selection, and are therefore aimed at avoiding taking on unwanted risks in the first place. These policies typically specify the strategies the firm will pursue, define how specialist skills are to be deployed to sustain them, require quantification of risks wherever possible, and offer guidelines for general management that reflect the given level of risk tolerance.

Firm management typically implements firm-wide risk policies by translating them into tangible and verifiable policies, processes and controls. These include three primary components: (1) an approach to risk identification and measurement, (2) a detailed structure of limits and guidelines governing risk-taking, and (3) internal controls and management information systems for controlling, monitoring and reporting risks.

Risks are generally identified at both the individual business level and the fully consolidated levels of a firm on the basis of management policies. While most risks are identifiable, not all are quantifiable. In some cases, simply being aware that risks exist allows a firm's management to take the steps it deems necessary to avoid or mitigate those risks; legal risks constitute a good example. In other cases, a more sophisticated measurement approach is possible and implemented to determine the firm's risk exposure.

Conceptually, the measurement of any risk – whether market, credit, liquidity, technical or operational – is composed of three factors: the scale of the exposure, the likelihood of a loss, and the size of the loss. The latter two components are uncertain and generally need to be looked at from a statistical perspective. This requires the use of data, which is more readily

available in some areas (e.g., market risk) than in others (e.g., operational risk). There are also cases where the scale of the exposure may itself be uncertain. These could include insurance contracts where there is no upper limit on exposure and derivative contracts where the counterparty credit exposure depends on the market value of the contract.

The extent of measurement varies across risk types according to the sophistication of the available methodologies and the emphasis of the firm. The use of quantitative techniques, often statistically based, is common to the measurement of the key risks in each sector. Quantitative measures of risk are important inputs into risk management decisions, including the appropriate pricing of products (whether a loan, insurance policy, or derivative contract) and whether to hedge or transfer the relevant risks in some fashion.

A common aspect of risk measurement is the analysis of different scenarios, including moderately adverse scenarios as well as low probability events with the potential for large losses and scenarios where key assumptions break down, to create an accurate profile of the institution's risk susceptibility. The results of these stress tests are reported to senior management and the board of directors and considered when establishing and reviewing risk management policies and limits, and may also be used in setting technical provisions at insurance firms.

Assessments of risk, both qualitative and quantitative, form the key means by which risk exposure is monitored on an ongoing basis. The frequency of monitoring varies with the speed at which a situation can change and the importance of the risk to the firm. Assessment of risks by dedicated personnel and firm risk management committees is crucial to how these risks are managed by the firm.

Once risks are identified and quantified to the degree possible, management establishes policies and procedures to limit or otherwise control them. Such management policies and procedures specify the type of instruments in which the firm will invest, creditworthiness standards for borrowers of the firm's funds, and other risks which the firm will assume, e.g., through insurance policies or derivatives. Firms' risk policies often include position limits on individual exposures or types of exposures. There is typically a well-defined procedure for reporting exceptions to these limits to relevant levels of management. In some cases, for instance unusually large positions, exceptions may require additional management or even board review before the transaction can be completed.

Diversification, risk sharing and risk transfer techniques are used by firms in all three sectors to mitigate risks. A common technique is to diversify risks over a large number of positions bearing different risk characteristics, thereby reducing the potential overall impact of adverse behaviour of a specific position. Risk mitigation takes different forms in the three sectors. Banks and securities firms mitigate risks by taking collateral. Insurers mitigate risks by including deductibles in their policies. Securities firms (and banks too) reduce risks by establishing legal agreements to net exposures against liabilities to the same counterparty. Firms in all sectors transfer risks to third parties. Insurance companies have been doing so for many decades through the process of reinsurance. Banks securitize loans. Both banks and securities firms (and, to a lesser extent, insurance firms) also hedge their exposures through derivatives. With the advance of risk measurement techniques, all sectors are increasing the number of risk transfer techniques that they use.

Another important theme that is common to the risk management approaches of the three sectors is the importance of independence in risk assessments and in the risk management function more generally. This can be observed in reporting lines as well as other policies that serve to ensure that operating business lines do not have exclusive control over risk management calculations and decisions. Internal control measures, such as segregation of duties and limiting access to information systems are also part of this process.

Firms have management information systems in place to help verify that all of the limits, policies, and procedures are being implemented, and to monitor the institutions' risk exposures on an ongoing basis. In addition, many institutions have established a risk management function independent of each business line, whose main function is to measure risks, check the adequacy of procedures and processes and propose, where necessary, means to mitigate risks or improve controls. Another mean to ensure that risk control procedures and systems are achieving the desired results is for firms to engage both internal and external auditors to review them.

A final way to protect firms against adversity is to maintain both reserves (provisions)⁴ and capital as mechanisms to absorb potential losses. Banks maintain reserves against loan losses. Securities firms generally do not maintain loss reserves⁵, except in the limited circumstances, e.g., where they are required to book a contingent liability in relation to an adverse legal judgement or proceeding. Insurers' technical provisions are somewhat different because they represent funds that the insurers expect to pay out to claimants rather than funds reserved against future losses. Finally, all sectors maintain capital cushions, in the form of shareholders' equity, against unexpected losses. These cushions also protect the firm against losses that they cannot easily measure or manage through other methods.

However, the reliance on capital and reserves varies among the three financial sectors and even, for a given sector, among countries. In most jurisdictions, the reliance on the respective buffers progresses from predominantly provisions in the insurance sector to predominantly capital in the securities sector. This issue will be discussed further in Section III of the report.

Credit risk

Credit risk is the risk that a counterparty will fail to perform fully its financial obligations. It includes the risk of default on a loan or bond obligation, as well as the risk of a guarantor or derivative counterparty failing to meet its obligations. This risk is present to some extent in all sectors although it is most important in banks because lending, where credit risk is crucial, remains their core activity and loans make up the bulk of their assets. Banks have expended substantial efforts to manage credit risk because it is so crucial for them. Sound practice today includes the use of credit personnel independent from the lending area whose primary function is to assess and monitor credit risk, the establishment of borrower qualifications and credit limits, the incorporation of appropriate risk premiums in pricing, and the establishment of loan loss reserves.

Banks commonly have an established and formal evaluation and approval process for granting new credits and for extending existing credits. They frequently maintain specialised credit units to analyse credits related to specific products and geographic sectors. The credit granting approval processes typically uses a combination of individual signature authority, dual or joint authorities and a credit approval group or committee, depending upon the size and nature of the credit. Overall credit limits are established both at the level of individual borrowers and counterparties and groups of connected counterparties. Such limits are

⁴ Please refer to the glossary at the end of the report (Annex 1) for a definition of reserves and provisions in the banking sector.

⁵ In some jurisdictions, such as EU member countries, securities firms may be allowed to constitute general loss reserves. However, in the US and in other jurisdictions, securities firms are not allowed to constitute such general reserves.

generally based at least in part on an internal credit grading scale, where counterparties that are assigned better grades potentially receive higher credit limits. Limits are also established for particular economic sectors, geographic regions and specific products. These limits help to ensure that the bank's credit-granting activities are adequately diversified. In many jurisdictions, such as in the EU, banks are accordingly subject to large exposure and risk concentration rules.⁶ Banks price credits in such a way as to cover all of the embedded costs and compensate them for the risks incurred.

For loans outstanding in their portfolios, banks have created extensive loan classification systems as an aid in measuring and monitoring credit risk. In recent years, banks have built on such approaches to develop systematic internal models for the quantification of credit risk and have thereby moved toward a portfolio approach to credit risk management. Such internal models measure default probabilities, exposures at default and potential losses given default. This information is used to estimate the amount of economic capital needed to support banks' activities that involve credit risk. The economic capital for credit risk is determined so that the estimated probability of unexpected credit loss exhausting economic capital is less than some target confidence level. In practice, this target confidence level is often chosen to be consistent with the bank's desired credit rating.

To mitigate credit risk, banks use a wide range of techniques including collateral, guarantees and, increasingly, credit derivatives. The development of more systematic approaches to the measurement of credit risk through internal models has been a significant factor encouraging the greater risk use of credit risk transfer techniques and a more liquid market for instruments such as credit derivatives. Credit risk mitigation techniques used by banks for their market operations, especially in their trading books, are similar to those used by securities firms in that they rely heavily on collateral.

Securities firms expose themselves to credit risk through many of their activities such as making margin loans to customers, entering into derivatives contracts, borrowing or lending securities, executing repurchase/reverse repurchase agreements, and occasionally extending accommodation loans in connection with pending transactions. They address credit risk by holding highly liquid collateral on a fully secured basis in the case of margin loans, securities borrowing and lending, repurchase and reverse repurchase agreements and generally for over-the-counter derivative transactions involving poorly rated counter-parties. However, they also take on unsecured credit risk in connection with derivative transactions with certain counter-parties and with their accommodation loans.

As with banks, securities firms undertake significant credit analysis of the counterparties to which they bear credit exposure and attempt to monitor changes in credit quality closely. With respect to fully secured transactions, securities firms seek to mitigate credit risk by adjusting collateral requirements on a daily basis (daily re-margining).

For partially or unsecured transactions, they mitigate credit risk by increasing or imposing collateral requirements when the creditworthiness of the counterparty deteriorates, for instance, when its ratings are downgraded. In addition, securities firms enter into master netting and collateral arrangements with counterparties and develop internal credit rating systems to assess creditworthiness. They establish credit guidelines that limit current and potential credit exposure to any one counterparty or type of counterparty (for instance by

⁶ For instance in the EU, Directive 92/121 on large exposures, which also applies to securities firms. Similar rules exist in other jurisdictions. They generally incorporate best practices as outlined in Basel Committee publication Measuring and controlling large credit exposures (January 1991).

rating category), and they periodically review counterparty soundness. Securities firms also structure transactions such that the firm can terminate or reset a given transaction's terms after specified time periods or upon the occurrence of a credit-related event.

Insurance companies have also expended considerable efforts in managing credit risk. Credit risk is present mainly in the extensive bond portfolios typically held by the companies and in their reinsurance arrangements. Additionally, life insurance companies may underwrite mortgage assets, which requires high levels of expertise and loan management and administrative skills, especially for commercial mortgages. Credit risk arising from investment portfolios is covered at insurance companies by written policies and guidelines specifying authorised assets and limits, responsibility levels for contracting, process of control and segregation of duties between front and back-offices. Specialised teams of analysts review credit risk at insurance companies. Firms' guidelines and requirements allow for judgement in assessing the level of credit risk related to a specific asset, the adequacy of its pricing and its level of liquidity. For instance, investments in private placements are allowed although quantitative limits are more stringent than for publicly traded issues. Projected investments are generally checked against five elements: safety, adequacy of returns, liquidity, diversification and spreads. The differences in business lines being run also imply specific credit risk limits. For instance, guaranteed products, where the insurance company is obliged to meet the contractual return requirements generate specific credit limits on authorised investments.

As described in section III below, many jurisdictions, such as those in the European Union, prescribe investment rules that limit the types and amounts of assets that insurance firms may hold, thereby limiting their exposure to credit risk. Insurance firms may also face credit risk on reinsurance agreements. If the reinsurer is unable to make good under the terms of the agreement, then the insurance company will bear a loss. For this reason, insurance companies undertake significant due diligence with respect to the firms with which they have reinsurance agreements in place. Insurance companies seek to diversify reinsurance cover by using an appropriate number of such firms and in some cases also seek additional protections such as collateral or letters of credit.

Market and asset liquidity risks

Market risk refers to the potential for losses arising from changes in the value or price of an asset, such as those resulting from fluctuations in interest rates, currency exchange rates, stock prices and commodity prices. Asset liquidity risk is clearly allied with market risk and represents the risk that an entity will be unable to unwind a position in a particular financial instrument at or near its market value because of a lack of depth or disruption in the market for that instrument.

Market risks, together with liquidity risks, are the most important risks for securities firms, which typically operate on a fully mark-to-market basis. Securities firms, which engage in the business of underwriting, trading, and dealing in securities, must necessarily maintain proprietary positions in a wide range of financial instruments. Therefore, the aim of such firms is not to eliminate all market risk, but rather to manage it to a level at which acceptable returns, net of market losses, can be generated.

Market risks are also important for banks and their affiliates that hold significant positions that are marked to market. Banks typically manage market and liquidity risks associated with such positions in the same manner and with the same kinds of tools as their securities firm counterparts. The situation is somewhat different in regard to assets that the firms intend to hold to maturity and may be illiquid (e.g., loans). Insurance companies are also subject to market risks. Here, such risks are generally classified as asset or investment risks in

insurance activities. The investment of premiums must generate income and have a realisable liquidation value sufficient to meet the firms' liabilities. Shifts in market prices could affect achievement of this objective.

Most securities firms and banks, together with insurance companies running significant trading positions, use statistical models to calculate how the prices and values of assets are potentially impacted by the various market risk factors. These models generate a "value-at-risk" ("VAR") estimate of the largest potential loss the firm could incur, given its current portfolio of financial instruments. More precisely, the VAR number is an estimate of maximum potential loss to be expected over a given period a certain percentage of the time. For example, a firm may use a VAR model with a ten-day holding period and a 99-percentile criterion to calculate that its \$100 million portfolio of financial instruments has a potential loss of \$150,000. In other words, the VAR model has forecasted that with this portfolio the firm may lose more than \$150,000 during a ten-day period only once every 100 ten-day periods.

Most VAR models depend on statistical analyses of past price movements that determine returns on the assets. The VAR approach evaluates how prices and price volatility behaved in the past to determine the range of price movements or risks that might occur in the future. VAR models are commonly back-tested to evaluate the accuracy of the assumptions by comparing predictions with actual trading results. In practice, while VAR models provide a convenient methodology for quantifying market risks and are helpful in monitoring and limiting market risk, there are limitations to their ability to predict the size of potential losses. These particularly relate to the possibility for losses in the event of unique market disturbances and the potential for a reduction in overall liquidity.

Firms use stress tests and scenario analyses to supplement and to help validate VAR models. Stress tests measure the potential impact of various large market movements on the value of a firm's portfolio. These tests can identify market risk exposures that appear to be small in the current environment but grow disproportionately under certain circumstances. Scenario analysis focuses on the potential impact of particular market events on the value of the portfolio. Frequently, large and disruptive events from the past (e.g., the 1987 stock market crash) are used as potential scenarios.

The main way to mitigate market risk, once assumed, is by taking positions in securities and derivatives whose price behaviour is negatively correlated to the issue or instrument whose risk is to be mitigated.

Asset liquidity is increasingly taken into account in marking instruments and in interpreting VAR results based on short holding horizons. Securities firms take account of the difficulty in liquidating some assets at or near market value by discounting such market values, for instance when the securities are thinly traded or when the firm holds a large position in a specific security. Banks apply similar requirements and policies for their market operations. Insurance firms also focus on the liquidity of their assets, particularly those that are allocated to cover technical provisions. In many jurisdictions, insurance firms are obliged to limit market and liquidity risks in their investment portfolios via limitations on the types and amounts of assets that they may hold. A number of firms reportedly are currently exploring the use of market liquidity adjusted value-at-risk as an assessment of price risk when market liquidity is an issue.

Funding liquidity risk

Funding liquidity risk is the risk that a firm cannot obtain the necessary funds to meet its obligations as they fall due. The amount of liquidity required depends very much on the institution's ability to forecast demand and its access to outside sources, particularly in a

stressed situation. In all sectors, a common liquidity risk mitigation technique is to diversify over funding sources. Contingency plans and stress testing are important mechanisms to help prepare for the increased demands for liquidity that can arise during stressful periods.

Among the three sectors, securities firms have the greatest exposure to funding liquidity risk because a majority of their assets are financed by short-term borrowing from wholesale sources. The liquidation of assets is not viewed as a source of funding, other than as a last measure to avoid insolvency. Accordingly, the primary liquidity risk facing securities firms is the risk that sources of funding will become unavailable, thereby forcing a firm to wind down its operations. A lesser consequence is that a firm, while not becoming insolvent, will have to reduce its balance sheet and limit its business activities.

Banks are particularly vulnerable to funding liquidity risk because they finance many illiquid long-term assets, mainly loans, with shorter-term liabilities, largely customer and inter-bank funding deposits, that are vulnerable to a “run” in the event of a drop in confidence. To address this risk, banks seek to maintain the confidence of their depositors through policies to maintain a strong financial condition. They also tend to hold a buffer of highly liquid assets and maintain backup liquidity lines from other banks. Broadly speaking, the management of funding liquidity typically involves an assessment of potential demands for liquidity during a stressful period relative to the potential sources of liquidity. If the analysis reveals a shortfall in potential sources during the stress conditions, then the bank likely will seek to expand the size or number of available sources.

Unlike securities firms or banks, insurance companies are in a different situation because their activities are pre-funded by premiums and most companies therefore do not rely significantly on short-term market funding. In this sense, their funding risk is partly related to a pricing risk. Such a pricing risk arises from the exposure to financial loss from transacting insurance business where actual costs and liabilities in respect of a product line exceed the expectations when pricing the contract. It is also related to asset liquidity risk insofar that insufficiently liquid assets could imply that a firm might not obtain the necessary funds to meet its obligations as they fall due by selling off assets. Exposure of life and non-life insurance companies to funding risk increases significantly when their credit quality deteriorates because of policyholders’ withdrawals. The impact of such withdrawals is generally mitigated by the inclusion of specific charges on withdrawal on the insurance contracts or by making withdrawals subject to the discretion of the insurance company.

Funding liquidity risk cannot be measured as objectively as market or credit risk. Generally, firms establish liquidity goals, which they use as benchmarks to measure against their actual liquidity. The risk then is measured in terms of the ratio between actual liquidity and desired liquidity. The desired liquidity or liquidity goal of most securities firms is to have sufficient sources of funding to be able to meet current debt obligations for up to a 12 month period, without issuing new unsecured debt or liquidating assets. This goal recognises that in times of stress, such as a market disruption or credit rating downgrade, a firm may not be able to roll over unsecured debt. In such circumstances, it will need to use other sources of funding such as pledging assets. This process requires some judgement, and stress testing is again an important part of the process. Banks also typically try to assess potential daily demands on liquidity and sources of liquidity over near-term horizons.

Since insurance companies’ funding is mainly derived from current premiums and assets, (i.e., past premiums) allocated to technical provisions and invested into assets, their main focus for funding purposes will be on adequate pricing of insurance policies in addition to asset risks (liquidity and yield of the assets). However, funding risk is also managed through cash-flow projections.

Interest rate risk

Interest rate risk is the exposure of a bank's, a securities firm's or an insurance company's financial condition to adverse movements to interest rates. Interest rate risk arises through some specific products with fixed rates or, more generally, because the overall structures of the firms' balance sheets creates an interest rate exposure. Banks and life insurance companies are typically exposed to interest rate risks for both reasons.

Banks for instance have large portfolios of long-term fixed rates mortgage loans, often with pre-pay options such as in the United States. Even in jurisdictions where pre-payment of such loans carries a specific fee tied to outstanding principal, such as in France, the amount generally does not fully compensate the bank's risk, especially if the loan is pre-paid within a few years after it has been extended. Banks seek to mitigate such interest rate risk through pool selling and asset securitization in addition to marketing long-term loans with variable interest rates, frequently indexed on short-term funding rates.

Life insurance companies are also largely exposed to interest rate risks through long-term life insurance products with guaranteed interest rates. This type of risk is often interpreted as technical risk since it results from life-insurance contracts and influences the amount of technical provisions. Although some jurisdictions have limited the maximum guarantee that may be offered, such as in the EU where the guarantee is limited through regulation (in Germany, for example, the guarantee is capped at 3.25%), there may be no such regulatory limits in other jurisdictions, for instance in the United States. The industry's world-wide response to such risk has been to develop products offering variable rates of return ("with profit contracts") or unit-linked products with daily price setting where the interest rate risks but also the potential benefits are passed on to the policyholders.

Both banks and life insurance companies seek to manage their overall interest rate risk through asset-liability management techniques that help to limit the "gap" between the interest-rate sensitivity of the asset side with that of the liability side.⁷ Banks, for example, have often developed measurement techniques, such as duration, to assess to what extent and to what type of interest rate risk their balance sheet may be exposed. They also have implemented procedures and approaches to hedge the risk through structured products and internal hedges that are matched by offsetting positions taken by the bank's capital markets department with third-parties. Callable debt and derivative products can also be helpful in managing the contingent nature of interest rate risks linked to mortgages with prepayment options.

In many jurisdictions, insurance companies have expended significant efforts to understand the sensitivity of their investment portfolios to underlying market risks, especially interest rate risk. For example, many insurance companies also seek to actively measure the "duration" of their bond portfolios through asset-liability management techniques so that they can match the duration of such portfolios with similar measures of duration related to their liabilities. They will then seek, according to such measurements, to actively manage the duration of assets and liabilities, for instance by reducing or increasing the duration and sensitivity of their bond portfolios or by modifying the duration of their risks through reinsurance contracts.

⁷ For life insurance companies, this overall interest rate risk arises essentially through long-term insurance contracts offering guaranteed interest rates (i.e. fixed interest rates). This risk arises in part because of a maturity mismatch. The long-term insurance products offering guaranteed rates may have maturity exceeding, for instance, the longest fixed income issues available on financial markets. When such fixed income investments mature, the life insurance company has no assurance it will be able to find alternative investments with suitable maturity and yield to meet the interest rates guaranteed to policyholders years before.

Technical risk (insurance underwriting risk)

Technical risk is largely specific to insurance and is generally the most important risk run by insurance companies.⁸ It encompasses the risks related with the pricing of products (premiums) and the setting of adequate technical provisions to cover claims in both life and non-life insurance.⁹ It is therefore sometimes also defined as the underwriting risk of the insurance company. Supervisory rules have been developed to protect insurance firms from technical risks that might endanger their ability to fulfil their obligations resulting from insurance contracts. Supervisory requirements dealing with prudent technical provisions, adequate reinsurance, and actuarial calculations are particularly important.

Insurance companies accept insurance risks and pay the resulting claims with funding from premiums collected and investment income earned. Generally premium payments result in significant pre-funding for life insurance and some pre-funding for other lines of business. Such premiums related to insurance contracts are, however, essentially different from bank deposits, where the guarantee is limited to the amount of the deposit plus accrued interest. For insurance policies, the guarantees are specific, event-related, and often multiple. Policyholders might recover more or less than they have invested when the event occurs, depending on the clauses of their contract and the severity of the event. The management of such risks by the insurance company relies on the underlying actuarial calculations that will be used for pricing the risks, for calculating the necessary technical provisions and for mitigating the risks through reinsurance.¹⁰

Differences in risk profiles of insurance activities are made according to the duration of guarantees, long for some life insurance activities or short for P&C, but also according to the loss distribution of such activities. Such business lines, such as property insurance, are deemed to be “short-tail” activities, because claims will occur and therefore payments will be made in a short time frame. On the contrary, other insurance activities, such as employers and third-party liabilities, are deemed to be “long-tail” activities because payments occur in longer time frames with high volatility in amounts and are therefore much more difficult to simulate and assess. In addition, many claims with “long-tail” distributions are also subject to material delays in the reporting of the claim to the company. Therefore, in general the risk that the technical provisions prove to be insufficient is higher in insurance business with “long tail” distributions.

For life insurance, the technical provisions can be described as the portion of the premiums and investment income retained (plus any additional amounts considered necessary), which, together with any remaining premiums to be received in the future, will provide for all expected claims and the related expenses. For other lines, the technical provisions can be described as the sum of an estimate of incurred and unpaid claims and related expenses plus the unearned portion of the premiums received, plus an estimate of any perceived deficiencies in these premiums.

⁸ There may be some cases in which firms in other sectors take on risks (e.g., through guarantees or annuities) that for an insurance firm would be classified as technical risks.

⁹ It should be noted that for some types of insurance products, such as credit insurance, the technical risks would in fact be credit risks.

¹⁰ It should also be noted that risks related to pension fund commitments for staff tend to be addressed in the same way as for insurance risks. Depending on the jurisdiction, commitments can either appear on the firm's balance sheet or be segregated in a separate fund. In some jurisdictions, there is also a public fund scheme for some specific risks such as natural catastrophes.

The establishment of provisions in this fashion achieves two purposes. First, in the income statement the accumulation of these amounts over various accounting periods prevents revenue from prematurely falling through to profit and instead allows profits to be released only when the funds are no longer needed for future claims or expenses. Second, in the balance sheet the technical provisions provide a value for the liability represented by the company's promise to pay as stated in the policies in force. Thus, the establishment of technical provisions from which future policy benefits can be paid is a critical process in the core business activity of all insurance companies.

As noted previously, technical provisions are the major element of the liability side of an insurance firm's balance sheet and tend to be significantly larger than capital. The capital held by the insurance company provides an additional buffer to pay potential claims if the technical provisions prove insufficient. There are different types of technical provisions and different approaches on how to calculate them. The main elements of the different approaches to the calculation of technical provisions are summarised in Annex 3 of the report.

An adequate system of reinsurance contracts provides an additional risk management tool for insurance firms to share and limit technical risks. Such contracts provide an important mechanism for transferring technical risks from primary insurers to reinsurers.

The actuarial measurement of technical risks also plays a significant role in the management of these risks. All insurance firms and insurance supervisors accordingly have or have access to actuarial expertise to help evaluate the appropriate level of technical provisions. Within a life insurance firm, actuaries serve a critical role in calculating the necessary policy premiums and the technical provisions. Other risk management tasks that may involve actuaries or actuarial calculations include (a) testing the adequacy of technical provisions, (b) designing insurance products and drafting the policy provisions, (c) pricing the products according to certain experience assumptions, (d) developing underwriting and administrative guidelines to achieve the desired experience, (e) helping to design investment strategy and performing asset/liability matching studies, and (f) designing reinsurance programs.

Because of the increasing size and complexity of insurance company operations, the identification and measurement of risk exposures have become more complicated. In some jurisdictions, supervisors have responded by placing more responsibility on an individual presumed to be knowledgeable and informed regarding the company's risk. This is the "appointed actuary" who is named and compensated by the company and meets certain educational and experience qualifications. In those jurisdictions, the appointed actuary is charged with the responsibility of reviewing the technical provisions (and in some jurisdictions, reviewing capital as well) and formally stating whether they meet the minimum requirements of the jurisdiction and are adequate based on the company's obligations and operations.

In other jurisdictions, actuaries or staff with similar expertise calculate the amount of technical provisions established and reflected on the company's balance sheet but do not have the responsibility of formally stating that they are adequate. Some jurisdictions prescribe that external auditors check the sufficiency of technical provisions. As a result from this check, the external auditor has to state whether the regulatory requirements have been met and whether he believes that the technical provisions are sufficient. The report of the auditor includes these statements and must be sent to the supervisory authority. In all jurisdictions, the ultimate responsibility for ensuring that technical risks are appropriately managed lies with the firm's senior management and board of directors.

Operational risk

Operational risk can be defined in a variety of ways. For example, the Basel Committee has defined operational risk as the risk of loss resulting from inadequate or failed internal processes, people and system or from external events. This definition generally excludes such risks as the strategic risk associated with business decisions. However it does include some elements of reputational risk as well as legal and compliance-related risks. Most firms in all three sectors address legal and reputational risks by seeking to have well developed compliance programs and by focusing on the need for adequate legal documentation of transactions.

Other types of operational risks arise when a firm is exposed to loss because of employee error, the failure of an automated system, or the failure of a communications network. As firms in all three sectors have increased their reliance on technology and automated systems, the management of these operations-related risks has taken on higher priority. The increasing prevalence of outsourcing of technology-related services is another contributing factor to the emphasis on such risks. The following discussion relates primarily to the risk management efforts that firms have made with regard to this set of operational risks.

Banks, insurance companies and securities firms process large amounts of transactions on a daily basis across diverse markets and business divisions. They are therefore exposed to operational risks related to these record maintenance and settlement and custody activities. This makes these firms highly reliant on skilled employees, automated systems, communications networks, and internal controls to maintain transaction volume and to ensure that each transaction is authorised and correctly entered into the books. Operational risks can occur at any point in the processing of a transaction trade, from initial contact with the other side to the ultimate entry of the transaction on the firm's records. Some of the potential consequences of failing to manage this risk include theft of firm or customer assets, misplacement of firm or customer assets, loss of capacity to process transactions in a timely manner, execution of transactions that are not subsequently booked, and creation of discrepancies between the firm's books and those of its counterparties or clearing banks.

An increasing number of firms have undertaken comprehensive research on measurements and methodologies for operational risk, reflecting various degrees of sophistication. Some are considering innovative insurance products in addition to traditional risk mitigation techniques as a technique for transferring some of the operational risks to third parties. These efforts are generally still in the early stages of development, reflecting the numerous difficulties in devising quantitative approaches, including the uniqueness of the sources of operational risk and consequently of measures to control the risk from one firm to another. The lack of sufficient internal loss data is also a prominent problem.

The primary risk management response in all sectors has been to seek to improve the quality of procedures and controls and to increase accountability and awareness. For example, a number of firms have set up dedicated operational risk units, which supplement traditional internal control and audit procedures. These units not only orchestrate qualitative steps to manage the risk, but also nurture more quantitative methods along the lines of those found for other risk types. Further, the units' existence increases the prominence given to operational risk in the eyes of senior management, so that they focus greater attention on the policies, procedures, assessments, and other generic techniques to manage this type of risk. Other forms of operational risk may require particular risk management approaches, including that of managing information technology risk and agency risk arising from outsourcing of important functions.

Firms' efforts to improve their procedures and controls have been prompted in part by increased supervisory focus and scrutiny on internal processes. Supervisors and regulators in all sectors have promulgated requirements for capital, custody, record keeping and

reporting, all designed to lead firms to adopt sound controls for executing and completing transactions and maintaining adequate segregation and custody of customer assets.

Risk consolidation

Within each sector, many firms are increasingly seeking to take a consolidated, enterprise-wide view of risk management. Their motivation comes from competitive forces to increase risk-adjusted returns on equity, in part by making more efficient use and allocation of capital, as well as from other current trends, such as globalisation, expansion across sector lines, and increasing involvement with products that entail multiple types of risk. Further, financial firms are increasingly managing their risks in structurally complex ways. For example, many firms use inter-affiliate transactions to transfer risks from different legal entities into a common vehicle where the risk can be managed and hedged on a more aggregate basis.

The need to consolidate or aggregate measures of risk can arise at several different levels within an organisation.¹¹ Within a business line, individual risk types (e.g., market risk or credit risk) may be aggregated across the various activities and positions. Consolidation at this level typically makes use of the relevant risk measurement methodology for the particular risk under consideration. This allows offsetting exposures to identical risk factors to be fully netted out and allows for diversification benefits across similar risk factors to be considered.

Some firms take this approach a step further and attempt to perform firm-wide aggregation of particular risk types. For example, it is common for firms employing VAR techniques for market risk measurement to attempt to aggregate all market risks related to trading positions throughout the firm into a single aggregate VAR calculation for the entire firm. This produces a consolidated measure of market risk for the entire firm.

Consolidation becomes more difficult when efforts are made to develop measures that are intended to encompass multiple different types of risk. For example, many firms have developed quantitative approaches for the measurement of both market risk and credit risk. It is therefore natural to ask whether these two measures can be somehow combined into a single measure that includes both credit and market risk elements as well as a sense of the degree of diversification between the two.

In practice, efforts at consolidating multiple types of risk could take place either at the business line level, or at the firm-wide level, or both. However, regardless of the point in the organisation where the consolidation is attempted, there are significant practical and conceptual difficulties associated with such calculations. First, the underlying time horizon associated with the different measures of risk is often different. For example, most credit risk measurement models focus on a one-year time horizon for measuring potential credit losses. On the other hand, most VAR models for market risk focus on one-day or ten-day horizons while some insurance activities have multi-year time horizons, often extending to decades in the case of life insurers. This means that it is not clear how risks can be quantified and aggregated.

Many firms have adopted “economic capital” as the relevant currency for risk across risk types and across business units. Firms using economic capital models calculate the amount of economic capital needed to support a given risk at given level of confidence. Many firms

¹¹ The following discussion draws on “Study on the Risk Profile and Capital Adequacy of Financial Conglomerates”, February 2001 by Oliver Wyman & Company, a study commissioned by supervisory bodies in the Netherlands together with the representative organisations of the financial sector.

set the confidence level for the measurement of risk so that it matches the default probability associated with a particular external credit rating. In this way, firms are calculating the amount of economic capital required to obtain a given rating for a firm taking on the underlying amount of risk on a stand-alone basis. Economic capital calculations are often performed at the business line level for a given risk type, but can also be performed on a firm-wide level.

Firms that want to calculate a consolidated economic capital figure for a given business line need to determine how they will aggregate across different risk types. If a common time horizon for the measurement of the different risks is feasible, then it may be possible to measure the extent of correlation between the different risks and thus to compute an overall measure of risk within a common paradigm (e.g., a VAR paradigm). However, this approach faces another formidable obstacle since the correlations between different risk types may be very difficult to measure. That is, there may be little or no relevant data. This is particularly the case in considering how to incorporate operational risks or technical risks into such a framework.

Because of the difficulties associated with differing time horizons and the difficulty or impossibility of precisely measuring correlations, many firms calculate the amount of economic capital separately for each risk type. These calculations are done on the basis of the preferred measurement methodology for each risk. The firm must then aggregate these separate measures of economic capital if an aggregate measure of economic capital is desired. Obviously, one approach is simply to add up the separate measures. If these separate measures are individually calibrated to capture the necessary economic capital at a certain confidence level, then simple summation can achieve no less than such a confidence level overall. In practice, if there are diversification benefits across risk types, then simple summation is a conservative approach.

Due to the inherent conservatism of the simple summation approach, many firms are seeking ways to roughly estimate the inherent correlations between different categories of risk and to bring these to bear in their processes for aggregating measures of economic capital. Similar procedures may also be used when firms attempt to aggregate measures of economic capital across business lines, when each business line's measure already attempts to aggregate across risk types. Because of the inherent difficulties of developing precise estimates of the degree of diversification benefits, many of these approaches are still in their early stages and often reflect a number of simplifying assumptions.

It is not clear how large the underlying benefits of diversification are across the key risk types for firms active in the three sectors. A recent study suggested that market and credit risks tend to be quite highly correlated (i.e., correlation values around 0.8), while technical risks and operating risks may be less correlated with the other risks (i.e., correlation values of 0.4 or below). Thus, depending on the nature of the firm's activity, the diversification benefit could range from more than one-third to a more modest 15 percent.¹² These figures provide only a single data point, however. Many firms may be tempted to overemphasise potential diversification benefits and it is therefore important to supplement such measures with stress tests on economic capital designed to explore the potential for correlated stress events across the different risk categories.

¹² "Study on the Risk Profile and Capital Adequacy of Financial Conglomerates", February 2001, Oliver Wyman & Company. Study commissioned by the supervisory bodies in the Netherlands together with the representative organisations of the financial sector.

In addition to economic capital approaches, another technique to study risks used by insurance companies is dynamic financial analysis (“DFA”), also known as dynamic financial condition analysis. DFA is a technique in which a model of the entire company’s operations according to the current, or an alternative, business plan is developed. The complexity of the model will depend upon the complexity of the company’s operation. This model is then used with a set of scenarios of the future to project operating results. A scenario provides basic assumptions about a hypothetical future, which the model then uses to project future financial results based on the business plan and the starting situation. The process is dynamic in that the model should respond dynamically to changes occurring in the hypothetical future described by each specified scenario. The projected future operating results will show the effect of the scenario’s parameters (e.g., stock market prices, interest rates, mortality rates, claims inflation, inflation generally, lapse rates, claims rates, sales, catastrophic events, etc) on the company’s operations (i.e., sales, claims, expenses, profitability, surplus levels, etc.).

A basic objective is to quantify the effect of certain risks and to measure the ability of surplus to adequately support future operations according to the business plan represented by the model. Repeated use of the model with various scenarios can provide information on the adequacy of surplus to support company operations under the current business plan, quantify the effect of specific risks on future operations, and to investigate the performance of alternative business plans. The number of scenarios required depend upon the methodology, the number of risks which are to be tested and the questions for which answers are desired. A complete analysis of a company with multiple product lines could involve several hundred scenarios, and where scenarios are computer generated, the number could be very much greater.

The challenges (problems) with DFA include:

- The scenarios should be internally consistent (i.e., avoiding contradictory assumptions about the future) and should explore all areas which could produce effects related to the risk(s) being studied. Thus, the choice of scenarios must be limited to plausible ones and must include a sufficient number with sufficient variation in all the material and relevant parameters to provide enough information to reach the proper conclusion. Each of these requirements present challenges.
- The projection results are very assumption-driven so care must be taken in developing the model so that the dynamic relationships included are reasonable and appropriate. Difficult but important items include investment strategy and how it will change with changing future conditions, future new business sales levels relative to scenario variations, and policy owner reaction and behaviour to future events.
- The results produced can include considerable data regarding future financials. Analysis will have to be performed and interpretations made to reach conclusions.
- This approach does not avoid considering correlations between risks. The model used must dynamically respond to the changes prescribed in the scenario by properly projecting the incidence of certain risk-related events. In order for this to be done accurately, the correlations between risks must be defined in the model or else input implicitly through specified scenarios.

The ultimate goal of DFA is to enhance the understanding of the company’s exposure to various risks, the understanding of the company’s financial condition including surplus adequacy, and to aid in the search for an optimal risk management strategy in the company’s operations.

For all of the reasons mentioned concerning both economic capital and DFA analysis, efforts to develop a practical single measure that spans all types of risk across all business lines are still in their infancy. Nevertheless, it is clear that a number of firms are thinking about such measures as well as approximations that provide meaningful insight into firm-wide risks even when precise results are likely unobtainable.

Market assessments of risks and risk management

The working group interviewed market analysts and rating agencies to help understand how financial firm risk management is assessed by these entities.

Financial analysts and rating agencies play a prominent role among market participants through their assessments of institutions and their recommendations for investors. For such analysis, they rely on information disclosed by the assessed institutions, as well as on other publicly available quantitative and qualitative information. The major rating agencies do attempt to perform some assessments of the key internal risk measurement and management models used by firms in all three sectors. A distinct approach is applied to each of the three sectors and the risk management reviews tend to focus most heavily on the predominant risk of each sector.

Although breakdowns of performance by business line are increasingly made available to market participants, breakdowns of exposures among geographical areas and breakdowns of risks are much less common. In addition, such breakdowns prove difficult to compare between institutions, in part because methodologies and accounting standards used by firms tend to vary from one institution to another. In addition, firms are still in the process of developing integrated risk management systems, processes and controls that would allow managing all risks across the whole group. Such limitations are compounded in the case of international financial conglomerates that cut across jurisdictions, sectors and markets.

The need for market participants to compare firms across industry is growing with the emergence of financial conglomerates as firms seek to diversify their activities in response to changes in the marketplace and with the more general consolidation of financial services. Although most investors still generally invest by making comparisons within a sector peer group, cross-sector assessments are mentioned by credit rating agencies and analysts as becoming an increasing requirement, especially for assessing the largest financial conglomerates. This leads to the necessary cross-fertilisation of skills between bank, securities firms and insurance analysts.

In assessing financial firms, both rating agencies and market analysts' focus largely on earnings and other information that might help generate forecasts of future earnings. The equity analysts are primarily interested in estimating valuation from a discounted earnings model while the rating agencies are more interested in estimating the risk to the firm's debt issues and use earnings and forecasts on future earnings as an indicator of a firm's ability to repay its debts.

Given the critical importance of risk management to firms in each of the three sectors, steps that could be taken to support a robust emphasis on risk management by market analysts have been discussed. In several cases, analysts noted that their ability to evaluate the quality of risk management could be hindered by the lack of available information. Therefore efforts to strengthen market discipline by developing better, more comparable, and more meaningful disclosures related to risk and risk management could be highly beneficial. In this regard, efforts such as those of the Multi-Disciplinary Working Group on Enhanced Disclosure, that was sponsored in part by the parent committees of the Joint Forum, should be supported.

III. Supervisory Approaches and Capital Regulation

This section discusses supervisory approaches within each sector, with a particular emphasis on capital regulation. The relative role of capital regulation within each sector is best understood in the context both of the broader objectives that supervisors within each sector are attempting to achieve and of the various approaches that supervisors use. The context for evaluating sectoral capital regulations also includes differences in perspective across the three sectors that flow from differences in the nature of the underlying businesses, many of which were mentioned in the previous section.

Accordingly, this section begins by summarising some of the most fundamental of these distinctions, including how they relate to supervisory perspectives within each sector. It then considers the primary objectives and key elements of supervision for banks, securities firms and insurance companies. The discussion of key objectives draws heavily on the work that has been undertaken by the Joint Forum to compare the core principles of supervision across the three sectors. Additional emphasis is given to the role of capital regulation and the major capital regimes within each sector are outlined. The section then turns to the issues involved in drawing comparisons between these capital regimes and identifies the conceptual difficulties associated with making highly specific comparisons for specific risk types or instruments. The section concludes with a discussion of the potential interactions between the various capital regimes, in particular focusing on cross-sectoral risk transfers and cross-sectoral subsidiary investments.

Differences in perspective

Time frames

One difference in perspective relates to differences in the time frames associated with activities in the three financial sectors. Such differences are closely related to the maturity and liquidity of the risk exposures arising from the core businesses of each sector. These differences affect the extent to which firms and regulatory frameworks in each sector tend to rely on reserves and/or on capital to cover losses and payouts. Although such differences are far from absolute, they provide some of the underlying rationales for the particular supervisory approaches to capital regulation associated with each sector that are presented in the following sections.

The securities sector tends to reflect the shortest time horizon. The assets of a securities firm are primarily receivables fully collateralized by securities or cash and portfolios of proprietary securities and other financial instruments. The values of a firm's financial assets are determined by market price, which can change throughout a trading day. Therefore, the values of securities firm's assets are subject to continuous and frequent re-evaluation depending on the extent of its holdings in securities or other financial instruments. Market price also determines the current amount of certain liabilities of securities firms (e.g., obligations arising from the sale of securities that the firm does not own).

The market prices of these financial assets are subject to fluctuations caused by the reactions of market participants to a range of events, some specific to the issuer (e.g., quarterly earnings reports), and others general to the overall markets (e.g., changes in interest rates). Securities firms use statistical models based on historical data and correlations to anticipate potential future changes in the prices of the securities or financial instruments they hold. The measure of market risk derived from these models is helpful in analysing a firm's market risk exposure and setting risk limits. However, securities firms recognise that past changes may not necessarily predict future results. Accordingly, firms seek to mitigate market risk by diversifying their portfolios and taking offsetting positions or

hedged. Regulations focused on the financial condition of securities firms also typically take account of the effect of market fluctuations on firm value.

For banks, the time horizon tends to be somewhat longer. The value of market instruments held and traded by banks is constantly reflected in their market prices, just like those of securities firms. However, the majority of banks' assets still consist of loans that are less than fully liquid. Since loans are not as commonly tradable, there is frequently no instantaneous market value for these categories of items. The absence of available market prices for such items in turn implies a reliance on loss provisions, in order to adjust the asset values to expected losses, which is not the case with securities firms. Bank supervision also tends to focus on the approaches that banks use to protect against potential losses over time horizons of a year or longer.

The time horizon for a specific insurance company can vary widely. It will be heavily influenced by the average time to maturity of its liabilities, which will depend upon the types of coverage written. Some types of coverage (e.g., health insurance or hail, storm and fire insurance) may have short terms and the related assets would be short term and liquid. But many types of coverage are of longer duration (e.g., life, long-term disability, and immediate and deferred annuities, general and motor vehicle liability). Thus, maturities for insurance contracts tend to vary widely, from less than one year to many decades, depending on the type of insurance involved. Since many companies write more than one type of coverage, the management may have multiple time horizons in mind for the various blocks of liabilities, some of which may be longer than a year. Accordingly, an insurance company will often have a time horizon longer than a year as part of the management of its liabilities.

Insurance companies with long term liabilities tend to adopt a long-term perspective relative to the investment of assets. Assets related to a block of policies are structured so that asset cash flows (i.e., maturities, dividends, etc.) roughly occur when claims and expense cash flows exceed the premium revenue (asset/liability matching). Normally this matching is not exact and some mismatch is accepted to increase yield. Some companies actively manage their portfolios to increase the yield. But the matching is close enough so that unscheduled liquidations of assets at a loss are relatively rare. Thus, for those jurisdictions where book value accounting is used, it continues to be workable. So, with due regard for the expected incidence of future payouts and for current investment conditions, insurance companies with long term liabilities tend to adopt a long-term perspective relative to the investment of assets.

Relative importance of capital and provisions/reserves

A second key difference of perspective across the sectors concerns the relative emphasis placed on capital relative to provisions or reserves. As the discussion of stylised balance sheets in section II of the report indicated, technical provisions are typically much larger than capital amounts for insurance companies. For banks, on the other hand, capital tends to be a larger proportion of the balance sheet than loan loss reserves. Finally, securities firms generally do not maintain reserves, other than those for legal contingencies, and therefore capital is the cushion against losses from market risk for these firms.

The relative importance of capital and provisions or reserves in the three sectors is not simply an arbitrary choice or convention. Instead, these differences reflect fundamental features of the core business activities of the sectors. This can be seen by considering the statistical properties of these underlying businesses.

For insurance companies, the fundamental business activity is the collection of premiums and the payment of claims (policy benefits). It is important to emphasise that the payment of future claims on insurance policies is not the same as incurring a loss. Rather, all insurance companies anticipate the need to pay claims on the policies they underwrite, and therefore

the payment of future claims is a fully foreseeable event. From a statistical perspective, insurance companies attempt to develop models of the probability distribution of future claims. Any given probability distribution will provide information on the likely average claim experience that can be expected as well as information about the potential size of deviations from the estimated average claim experience.

On the basis of actuarial assessments of potential future claim experience, as well as supervisory guidelines, insurance companies set technical provisions. It is therefore not surprising that technical provisions are significant. In essence they reflect an estimate of the foreseeable claims. They are not necessarily equivalent to a pure mathematical estimate of expected claims (i.e., the mean of a particular probability distribution) because firms typically do not know the probability distribution of future claims with certainty. Rather, there may be a number of potentially relevant probability distributions from which the insurance company must draw a judgement about the appropriate prudent level of technical provisions.

It is not uncommon for large parts of the technical provisions, especially in non-life insurance, to be estimated on a case-to-case basis. The idea underlying this technique is that the information available for each claim is used to estimate the necessary amount of technical provisions. The potential role of actuarial judgement therefore remains critically important in the insurance sector, although it does imply that firms in different jurisdictions may reach different opinions about the size of necessary technical provisions, depending on the degree of conservatism that is typically factored into such assessments. For example, regulations may require the use of assumptions in the calculation of technical provisions that are implicitly conservative.

Capital within an insurance company helps to address situations where claims exceed the level that was anticipated by the technical provisions. For life insurance companies, the statistical properties of mortality and morbidity tend to be highly predictable so that the potential for deviations of claim experience far from that embedded in the technical provisions is low. For this reason, life insurance company capital tends to be quite smaller in magnitude than technical provisions.

For non-life insurance companies, the statistical properties of potential claims are much less easy to assess and are far less predictable than for life insurance companies. In practice, this has two implications. First, because of the inherent uncertainty in the nature of the probability distribution of potential claims, technical provisioning for non-life insurance companies may include additional prudential measures in an effort to take account of such uncertainties. Second, because of the greater potential for claim experience to deviate from that foreseen in the technical provisions, non-life insurance firm's capital makes up a larger share of the balance sheet than for life insurance firms. Even for non-life insurance companies, though, capital is still smaller than the technical provisions.

Turning to the securities sector, the key risks are market and liquidity risks. As noted, securities firms generally do not maintain reserves against such risks. This reflects the fact that the assets held by securities firms are revalued frequently and regularly through market prices. The marking-to-market process implies that the current price of a financial asset should typically reflect at least as large a likelihood of declining as of increasing. Thus, generally speaking, no losses should be anticipated for a portfolio of traded assets whose prices all reflect current market conditions.

Therefore, not surprisingly, securities firms do not rely on loss provisions (reserves) for revaluation of assets since all financial assets are recorded at fair value on a daily basis. Moreover, general reserves are not permitted in some jurisdictions, for example under US GAAP, although securities firms are allowed to record liabilities for probable losses due to pending litigation. Since losses related to financial asset holdings will predominantly be

recorded in a securities firm's income statement as they occur, securities firms and securities regulators look to capital to absorb market shocks and ensure the firms' survival and to protect investors. Accordingly, regulatory capital requirements for securities firms are designed to ensure that the firm has adequate capital to absorb market value changes during a period of liquidation, if necessary. Because of the key role of liquidity, regulatory calculations of a securities firm's net worth and Basel standardised market risk factors require discounts (haircuts) to be applied to the fair value of each instrument according to its perceived degree of liquidity.

The situation with respect to banks is somewhat intermediate between that of securities firms and insurance companies. The dominant risk of most banking firms is credit risk. From a statistical perspective, there is a likelihood that at least some loans will not be repaid so some amount of loan losses can be anticipated. In practice, banks tend to address the loan losses they anticipate through loan loss reserves. These reserves can be of several types and their treatment also differs across jurisdictions. As their name implies, specific loan loss reserves tend to relate to specific credit exposures and effectively provide a means for the bank to write down the value of particular assets.

In addition to specific loan loss reserves, different jurisdictions allow a variety of other types of reserves, including disclosed reserves, undisclosed reserves, revaluation reserves, and general loan-loss reserves. In regard to the coverage of credit losses on lending activities, general loan-loss reserves are held against potential losses that may be estimated due for example to changes in underlying economic conditions, but for which it is not possible to definitively ascribe the reserve to specific assets as in the case of specific reserves.

Loan loss reserves are therefore important for banks in providing a buffer for anticipated credit losses; for example those associated with non-performing and deteriorating loans. In theory, loan loss reserves could be seen as a bridge between market value accounting and book value accounting. When there is such equivalence between market values and book values less reserves, then capital is effectively available to absorb unexpected losses or the tails of the loss distribution only whereas loss reserves cover expected losses. Such equivalence relies on the key assumption that loan loss reserves accurately reflect expected losses. A related point is that in assessing capital adequacy, loss reserves and capital must be considered together. However, statistical experience suggests that credit losses can also deviate substantially from anticipated levels so there is a need for banks to build a capital cushion to absorb unexpected losses. The probability distribution of credit losses implies that unexpected losses can exceed anticipated losses by a significant margin. That is, the size of credit losses in bad periods significantly exceeds the level of losses that can be expected on average across all periods. Accordingly, for most banks, capital tends to be significantly larger in size than loan loss reserves.

In summary, the relative role of capital and provisions or reserves differs significantly across the three sectors. Technical provisions are most important in the insurance sector, where they provide an estimate of the level of an insurer's contractual obligations to customers (which, unlike other sectors, cannot be known with certainty) and thus provide the basis for paying claims. Capital provides an additional and ultimate buffer to cover losses instances where claims experience (actual payments) exceeds the level anticipated by the technical provisions (estimated payments). In the securities sector, frequent marking-to-market effectively eliminates expected losses and capital to cover unexpected losses is the dominant form of protection against potential losses. Finally, in the banking sector, anticipated credit losses can be significant and loan loss reserves therefore are an important cushion against potential losses. However, unanticipated credit losses can be even more significant, and thus bank capital tends to be larger than loan loss reserves. In spite of the differences across the three sectors, it is also important to emphasise that firms in each

sector account for all losses that can be reasonably be anticipated directly on the balance sheet, whether by technical provisions, marking-to-market, or loan loss reserves.

Relative emphasis on consumer protection and financial stability

Traditionally, the broad objective of supervisors and regulators of the three sectors has been to protect customers, whether these were depositors, investors or policyholders. Over time, as firms have become larger and more entwined with other market participants, supervisors have in some cases also been concerned to limit the potential implications of the sudden failure of a financial institution on the financial system and the economy. While these concerns probably have the longest history within the banking sector because of its traditional role in many jurisdictions, there are arguments both for and against assigning a greater concern to the potential failure of a banking firm relative to a securities or insurance firm. On the one hand, there are arguments that the structure of interbank liabilities and banks' role in the payments system as well as their role in providing credit could make the sudden failure of a large bank a particularly destabilising event. Concerns about the illiquidity of bank assets and the susceptibility of banks to "runs" can also be cited as potential reasons why bank supervisors might consider the broader implications of bank failures in developing supervisory policies.

On the other hand, it should be recognised that large securities and insurance firms could also create significant spillovers in case of failure. These could take the form of direct linkages with consumers (e.g., through pension fund holdings), linkages with other market participants (e.g., through derivative contracts) and through payment and settlement systems. More broadly, it is clear that larger firms give rise to more such concerns than smaller firms, regardless of sector.

The extent to which concerns over "systemic risk" currently do or should play a role in the development of supervisory policies in each sector is not completely clear. Supervisors in some jurisdictions place more emphasis on these concerns than others, even within the same sector, so it is hard to make generalisations across the sectors. Moreover, even in cases where supervisors are interested in minimising the possibility of substantial spillover effects from a failure, there is no general agreement about the implications for supervisory policies. In particular, it does not automatically translate into the desire for more stringent capital requirements. Nevertheless, the relative emphasis on "systemic risk" could be an important factor informing and motivating the approaches taken by individual supervisors within the three sectors.

Issues associated with resolving troubled firms

A final difference in perspective that can be useful in setting the context for supervisory and regulatory policies across the sectors relates to the issues that may arise in addressing a troubled firm. In all sectors, there is a preference to resolve such situations via private sector solutions (i.e., recapitalisation, and merger) rather than through a liquidation of the firm. This preference arises because of the desire to limit spillover effects on customers and other third parties and to limit the loss of value and administrative costs that can accompany closure. However, not all troubled firms can be resolved via market-based solutions and it is therefore useful to consider the approaches taken within each sector when firms must be closed. In all cases, these approaches can differ significantly across sectors and across jurisdictions as a result of the different bankruptcy or liquidation regimes that are in place.

Within the securities sector, if other avenues are not available, the focus of the regulator in a failure scenario will tend to be on prompt and orderly liquidation, primarily to prevent further deterioration of the firm's solvency resulting from additional adverse changes in market

prices or from operating expenses. The possibility to liquidate rapidly is enhanced because the majority of the assets for securities firms is marked to market and are generally readily marketable. Another key focus of regulators in such situations is the transfer of customer accounts to healthy firms as rapidly as possible. Clearly, the more complex and illiquid the positions held by a securities firm, the greater is the risk that it will be difficult for the firm to close out such positions without incurring additional losses. Thus, it is not surprising that securities firm capital requirements tend to reflect concerns over the liquidity and volatility of the underlying instruments.

For banks, winding down or liquidation can be a more involved and time-consuming process. For example, large loan portfolios typically cannot be liquidated rapidly on a piecemeal basis without incurring significant risk of additional loss. Therefore, supervisors may undertake initiatives to sell particular business lines or portfolios as a whole. In some jurisdictions, “bridge bank” authority exists to allow supervisors to continue operating the closed bank under specific authority with the objective of winding down remaining activities over a period of time. Such approaches are intended to help avoid the costs and the potential for “runs” that could be associated with attempting to rapidly liquidate a banking firm with a significant quantity of relatively illiquid assets.

The primary objective of insurance supervisors is to protect policyholders. Likewise, the insurance firm is obliged to fulfil its contractual obligations. For property and casualty insurance this means that the insurer has to bear technical risks according to the remaining duration and/or obligation of each individual contract. The contractual obligation may still exist even in cases where the premium for this obligation was received years ago. In life insurance, holders of insurance policies will typically not be in a position to demand an immediate withdrawal of funds. In addition, conditions related to policyholders (for instance age or health) are likely to have changed, often significantly, since contracts were initiated and replacements of such contracts may prove to be either very costly or impossible for the policyholder.

For these reasons, insurance companies cannot be liquidated as quickly as securities firms or even as banks. Accordingly, when its supervisor restricts the business of an insurance company, it is typically closed to new business (therefore “ring-fencing” its assets and liabilities) and maintained in a state of care. After the issues have been sorted through and managed so that continuing obligations under the contracts can be fulfilled over the long term, its policies are transferred to another company.

This process nevertheless needs in most cases to be completed over a relatively short time frame compared to the term of the liabilities. Otherwise, if an insurance company runs into financial difficulties, policyholders tend to exercise all available options to withdraw their funds (life insurance) or to not renew contracts (property and casualty insurance), therefore further reducing the firm’s ability to meet remaining policyholders claims as they mature progressively. However, because of this longer time horizon, the time pressures involved are generally less than those associated with a bank or securities firm wind-down.

Summary

This subsection has attempted to provide some discussion of underlying differences in perspective across the three sectors, particularly as it informs the development of supervisory approaches and capital regulation across the sectors. These differences are not always present and some may be more significant than others. Nevertheless, the issues associated with differing time frames, differential emphasis on provisions relative to capital, the objectives of financial stability, and differing approaches to firm closure merit particular mention. This section of the report now turns to a description of supervisory approaches within each sector, with a particular emphasis on capital regulation.

Bank supervision

Primary objectives of banking supervision

The task of bank supervision, as described in the Basel Committee's core principles, is "to ensure that banks operate in a safe and sound manner and that they hold capital and reserves sufficient to support the risks that arise in their business". This is consistent with the view that the prudential regulation of banks helps to limit the costs associated with potential bank failures. Such costs involve losses to bank depositors, but also, to some extent, losses to taxpayers and other third parties. Although the traditional focus of banking supervision is on deposits and the protection of depositors, the broader impacts resulting from unsound operation may also be important. Accordingly, bank supervisors typically attempt to balance the desire to protect a subset of depositors through safety net arrangements (i.e., deposit insurance) with the need to mitigate moral hazard. In practice, this generally results in a supervisory program that strongly emphasises the prevention of difficulties and promotes safe and sound practices.

Key elements of the supervision of banks.

Key elements of the bank supervisory program to achieve these objectives typically include (1) efforts to ensure that bank policies and procedures conform with established sound practices, (2) ongoing monitoring of bank financial condition including periodic reporting, (3) capital regulation, and (4) limitations on permitted activities.

(1) Efforts to ensure that bank policies and procedures conform to sound practices.

In recent years, bank supervisors in many countries, as well as through the Basel Committee, have focused on developing and codifying sets of sound practices relative to many specific risk management issues. Some of the most recent issues through the Basel Committee include codification of sound practices on bank's interactions with highly leveraged institutions, sound practices for managing liquidity in banking organisations, best practices for credit risk disclosures, principles for the management of credit risk and customer due diligence for banks. In this fashion, bank supervisors have sought to call attention to the importance of risk management and to increase the rate of adoption of improved approaches to risk management.

Within individual jurisdictions, supervisors frequently provide guidance to the banking industry through supervisory letters or other similar means. These efforts are intended to draw banks' attention to particular issues and to alert them to supervisory expectations. Given the prominent role of credit risk at banking organisations, it is common for these types of supervisory efforts to focus on particular types of lending practices. Supervisors typically gather information for such initiatives by engaging in a dialogue with a variety of banks and in some cases other market participants. The information gathered from these discussions is useful in establishing the basis for how market practices are evolving and how they differ across institutions. By issuing guidance based on this process, bank supervisors continually encourage improvements and hope to prevent problems.

(2) Ongoing monitoring of bank financial condition including periodic reporting.

Evaluating bank policies and assessing the quality and adequacy of a bank's risk management are major aspects of banking supervision that are carried out on an on-going basis through mandatory and periodic reporting, on-going contacts with the bank's management and on-site supervision for those jurisdictions that undertake such on-site reviews. Increasingly, many bank supervisors have been adopting a risk-focused approach that seeks to concentrate the focus of such reviews on key elements of a bank's risk management and internal controls environment. This also reflects an effort to rely more

heavily on the bank's own control and audit processes to identify key areas of focus for examination and improvement. In all instances, supervisors place significant emphasis on how banks follow up on supervisory recommendations. Where improvements in processes or controls have been identified through the supervisory process, banks are expected to develop a credible plan for implementing these changes in an appropriate time frame. Bank supervisors typically have the legal authority to force banks to make the relevant improvements if this becomes necessary.

Not surprisingly, it is in the area of credit risk that the supervisory monitoring of bank condition is most well developed. Banks are expected to have processes in place for identifying problem credits and determining the extent of necessary loan-loss provisions. Supervisors have traditionally focused heavily on such processes. In some jurisdictions, the categories for problem credits are defined by supervisors, so that a basis for comparison exists across institutions. Bank supervisors typically monitor the approaches that banks use to classify credits and in some jurisdictions independently review individual credits as a means of assessing the accuracy and consistency of the banks' processes.

Other forms of information on bank condition are also commonly reported to supervisors. These include detailed balance sheet and income statement information as well as more detailed reports on certain kinds of activities. Through these mechanisms, supervisors are kept informed of the current financial condition of the firm and are able to compare individual banks with one another. Ongoing supervisory monitoring typically increases in intensity as a bank's financial condition worsens. In particular, specific reports (e.g., regarding the bank's liquidity position) may be requested on a more frequent basis and there is usually an extensive dialogue between the bank and its supervisor on the appropriate course of action to address the bank's underlying problems.

(3) *Capital regulation in the banking sector.*

Most bank supervisors impose minimum capital requirements on banking organisations. These requirements typically specify a minimum ratio of capital to assets. The Basel Accord, discussed separately below, is by far the most important basis for such regulation in the banking sector. Under the Basel framework, assets are risk-weighted so that the denominator of the capital ratio is intended as a proxy for risk. In addition to the Basel ratios, some jurisdictions impose supplemental minimum requirements on the basis of ratios where the calculation of assets or liabilities are not risk-weighted (i.e., a leverage ratio).

Supervisors generally pay close attention to a bank's capital ratios as a means for assessing the financial condition of the bank. In most cases, supervisors have explicit authority to impose corrective measures or other supervisory processes on banks that fall below minimum capital guidelines. In some jurisdictions, supervisors impose additional thresholds above the minimum levels that may trigger greater supervisory intensity or other specific actions short of those that would come into play at the minimum levels.

(4) *Limitations on permitted activities and licensing requirements*

The definition of banking services varies considerably across jurisdictions, but is often comprised of some combination of deposit taking and/or lending activity. In many jurisdictions, only licensed institutions are allowed to offer the services or combination of services that have been defined as banking services. There are typically specific and in some cases stringent conditions attached to the granting of such a license. These licenses also frequently impose limitations on the ability to undertake other activities, although the scope and intensity of such limitations varies across jurisdictions.

The Basel Accord

As noted above, the Basel Accord provides the dominant framework for bank capital regulation. Developed in the mid 1980's, it was initially adopted in 1988 by the G-10 countries as an effort to harmonise differing national regulations and promote a level playing field for internationally active banks. The Accord is now the basis for bank capital regulations in more than 100 countries. The Basel Committee and bank supervisors generally have endorsed the need for capital regulations to apply at the consolidated level. This has been motivated by the view that bank and banking group problems are inevitably difficult to separate and by the need to prevent banking groups from artificially inflating their capital ratios through double leverage.

The initial Accord focused on credit risk as the predominant risk for banks. It is still based on the calculation of a ratio of capital to "risk weighted assets" and sets a minimum for this ratio at 8%. Capital under the Accord is divided into tier one elements (primarily equity and retained earnings) and tier two elements (e.g., general provisions and subordinated debt). Banks need to maintain at least half of their capital in tier one elements. In practice, this means that two separate Basel capital ratios are frequently reported. The first ratio, known as the total risk-based ratio, consists of total capital as defined here (i.e., tier one plus tier two elements) divided by risk-weighted assets. The second ratio, known as the tier one ratio, is calculated by dividing tier one capital elements by risk-weighted assets. Clearly, if the minimum total ratio is 8%, and tier one must make up at least half of total capital, the minimum tier one ratio is effectively 4%.

The original Accord defined risk weighted assets such that all corporate and most retail loans receive a 100% risk weight, so that the effective capital charge on such assets is 8%. Residential mortgage loans receive a 50% risk weight (4% capital charge). Loans to OECD-member sovereigns receive a 0% risk weight, so there is no capital charge on such assets. Interbank loans to banks incorporated in OECD-member countries generally receive a 20% risk weight (1.6% capital charge), while those from other countries receive a 100% risk weight (8% capital charge).

The Basel Committee incorporated capital charges for market risk into the Accord in the mid-1990's. This applied capital charges to net foreign exchange exposures in each currency, and to the various price risks associated with trading positions that are marked to market in the bank's "trading book". In addition to Tier 1 and Tier 2 capital, a third tier of eligible capital consisting of short-term subordinated debt can also be used to cover market risk exposures (see also Annex 4, Capital Adequacy Directive). Two approaches to the calculation of a market risk capital charge were developed.

Under the standard approach, the charges are based on supervisory parameters related to size of the bank's open positions. The standard approach sets out various methods for estimating offsets between positions in equity, interest rate, commodity and foreign exchange risks but without scope for incorporating the effects of diversification across these risk factors. The standard approach then specifies a series of haircuts/capital charges for the open or partially offset positions after offsetting within each risk type. The specific risk factors for equity and interest rate risk may take into account whether the borrower is rated investment grade or not, as well as its sector and/or a proxy for its liquidity.

The Basel Committee also developed a so-called "internal models" approach to the calculation of a market risk capital charge. For those banks that meet a series of qualifying criteria, this approach effectively relies on their own value-at-risk calculations of market risk based on a theoretical options pricing model. Banks (and securities firms in the EU) choosing to use an internally developed VAR model to calculate market risk capital charges must demonstrate to their supervisor that their model meets minimum qualitative and quantitative standards, including incorporation of VAR into the firm's daily risk management process,

back testing to determine the precision of the model and continuous adjustment of the model. The total market risk charge is three times the higher of either the previous day's VAR estimate or the average of the VAR estimates calculated on the previous 60 business days.

Both the standard and the internal models approach to market risk distinguish between "general market risk" (the broad credit/equity index or yield curve concerned) and "specific market risk"(the individual credit/equity risk).

During the last several years, the Basel Committee has been engaged in a fundamental review of the Accord and has recently released substantive proposals for its revision. Key elements of the proposed revision include an emphasis on supervisory review of capital adequacy and market discipline in addition to minimum capital requirements (three pillars approach), significantly more risk-sensitive requirements in regard to credit risk, and the introduction of a capital charge for operational risk. The principles motivating these revisions are that (1) regulatory capital requirements should be made substantially more risk-sensitive, (2) the framework should include incentives for banks to improve their risk management and measurement capabilities, and (3) national supervisory authorities and market discipline have important roles to play in ensuring capital adequacy.

Supervisory review of capital adequacy is described as the second pillar of the new framework. Under the approach outlined by the Committee, supervisors should expect banks to have a process for assessing their overall capital adequacy in relation to their risk profile and a strategy for maintaining their capital levels. Supervisors should review such assessments and strategies with the bank and take appropriate action if they are not satisfied with the results. Clearly, this implies that banks are expected to operate above the minimum capital ratios. Many international banks already operate with capital ratios well above supervisory minimums; more than 200% and 150% of the minimum requirements for the tier 1 and for the total ratio respectively.

The third pillar of the proposed framework is market discipline. This reflects the view of the Basel Committee that it is critical for market participants to have the ability to independently assess a bank's capital relative to its risks. For market forces to be effective there has to be an adequate amount of disclosure regarding the key elements of the bank's framework. Thus, the new framework includes a series of requirements and recommendations for disclosures related to a bank's capital structure, its risk exposures, and other relevant factors such as the accounting standards and conventions that it uses.

In proposing revisions to the framework for the treatment of credit risk, the Basel Committee has recognised that banks around the world differ very significantly, both in the nature and complexity of their activities and in their approach to risk management. Consequently, the proposed framework provides a range of regulatory capital approaches from which banks can choose, subject to review by their supervisors. In other words, the new Accord no longer attempts to address all banks in a single "one size fits all" framework.

The menu of available approaches for credit risk under the proposals includes a standardised approach (modestly different from the current Accord) and two types of internal ratings-based (IRB) approaches --- the foundation and the advanced. The inclusion of these latter approaches is probably the most far-reaching aspect of the proposals. Under the IRB approaches, banks meeting certain qualitative standards could apply their own assessments of borrower creditworthiness to the calculation of the capital requirements for credit risk. This possibility would allow banks to take into account the diversity of risk profiles and increase the risk-sensitivity of the requirements. It would also allow banking institutions to link their internal risk management frameworks to their regulatory capital requirements, helping to eliminate growing discrepancies between regulatory and economic capital.

In order to ensure that the information provided by banks' internal systems is reliable, banks would be required to meet an extensive list of qualitative and quantitative requirements to ensure the integrity and credibility of banks' rating systems, processes and estimation of risk components. Supervisors would be expected to carefully monitor banks to ensure that they are fulfilling the requirements on an ongoing basis. Moreover, use of the IRB approaches would also be contingent on specific quantitative and qualitative mandatory disclosures related to the banks' internal ratings processes.

Another novel feature of the Basel Committee's proposals is an explicit capital requirement for operational risk. Developing banking practices – such as the reliance on rapidly evolving technology and complex financial products – have led the Committee to conclude that these risks are increasingly important factors to be reflected in credible capital assessments by both supervisors and banks. The proposals offer a spectrum of three possible methodologies for operational risk that go from very simple to quite complex. The most complex versions would allow banks to calculate their regulatory capital requirements for operational risk based either on internally generated risk estimates or on a fully-fledged internal measurement approach. The Basel Committee's stated intention is to provide incentives for banks to develop their ability to measure and manage operational risk. As banks develop their capabilities, they would progress to the more sophisticated approaches.

The Basel Committee intends to finalise its new capital adequacy framework in time for implementation of the new framework in 2005.

Securities regulation

Primary objectives of securities regulation

According to the International Organisation of Securities Commissions' (IOSCO) core principles, "the three core objectives of securities regulation are (1) the protection of investors, (2) ensuring that markets are fair, efficient, and transparent, and (3) the reduction of systemic risk". As noted by IOSCO, there may be significant overlap in the policies that securities regulators adopt to achieve each of these objectives. For example, regulations designed to ensure that securities firms operate in a manner that protects the interests of investors should also help reduce systemic risk.

Key elements of the regulation of securities firms

When looking at securities firms, the key elements include (1) custody of customer assets, (2) books and records, (3) operational controls, (4) inspections and reporting, and (5) the subject firm's capital.

(1) Custody of customers assets and asset segregation

Investors typically leave their securities in accounts at securities firms. In addition, they place funds in these accounts to purchase securities, or have funds credited to the accounts upon the sale of securities. Securities regulators seek to ensure that securities firms are not misallocating or misusing those customer securities and funds. One particular concern is that securities firms will use customer assets to expand or otherwise further their own business operations. Therefore, in looking at the way securities firms perform their custodial function, regulators focus on how they maintain control over customer property and segregate it from proprietary assets. The goal is to ensure that, if a firm fails, the contents of its customer accounts can be immediately returned to the customers.

(2) *Books and records*

Securities firms process large amounts of transactions on a daily basis across diverse markets and business divisions. Each transaction generates several separate records, each an important link in reconstructing a given trade. In addition, securities firms hold a wide range of domestic and foreign securities in their customer and proprietary accounts. The amount of securities under a firm's control is constantly changing as the firm and its customers effect transactions. Moreover, the securities that a firm owns or for which it has custodial responsibility are frequently maintained in different locations throughout the world. This complexity of operations makes the accurate and comprehensive keeping of books and records crucial to the securities industry. Additionally, regulators rely on books and records to confirm that a firm is complying with applicable financial responsibility, antifraud, and anti-manipulation rules and regulations. For these reasons, securities regulators pay particular attention to the quality of a firm's books and records processes.

(3) *Operational controls*

The size and complexity of securities firm operations create risks that, if not properly managed, can lead to substantial losses. These risks include improper or unauthorised transactions by employees, and inaccurate documentation of transactions leading to errors in the books and records. The management of these risks entails adopting and enforcing prudent internal policies that (1) place well-defined limits on the activities of the firm's business units, (2) require confirmation of each transaction booked, and (3) separate front and back office operations in independent units. When looking at a securities firm, securities regulators seek to ascertain whether it has established and is following such policies. The concern is that, absent proper operational controls, a securities firm is vulnerable to catastrophic internal events that can lead to its demise, thereby threatening its customers and other securities firms with which it has open transactions. Similar to bank supervisors, IOSCO and national regulators have increasingly sought to highlight the elements of such prudent policies through the publication of reports and other guidance.

(4) *Inspections and reporting*

Securities regulators monitor the financial condition of securities firms through both reporting requirements and on-site examinations. For example, in the US, securities firms that clear transactions and carry customer accounts must file a monthly financial and operational report that provides detailed information about the status of the firm's financial condition, ownership, and compliance with the capital and custody rules, among other information. Other securities firms file a similar report on a quarterly basis. Firms are also required to give regulators notice when their net capital level falls below early warning levels (which are set above the minimum requirements) and when they withdraw capital above certain threshold amounts. Generally, all securities firms must undergo a yearly audit by an independent auditor to verify the information in the periodic reports. Securities regulators also conduct on-site exams to test the financial reports filed by the firms. These activities are designed to allow regulators to identify firms experiencing financial or operational difficulties at an early stage. This provides the opportunity to work with the firm to implement steps to increase its solvency or, if necessary, begin the process of an orderly liquidation.

(5) *Capital regulation for securities firms*

As discussed earlier in this section, capital is the primary cushion against potential loss for securities firms. There are two major capital frameworks in place in the securities sector.

Within the EU countries, the Capital Adequacy Directive applies to both banks and investment firms¹³ and is essentially equivalent to the Basel Accord, although some jurisdictions apply additional requirements. The other primary approach to capital regulation in the securities sector is the net capital approach.

Net Capital Approach

In the US, Canada, Japan, and other non-EU countries, capital requirements are based on liquidity or net capital. This approach requires securities firms to maintain minimum levels of highly liquid assets sufficient to satisfy all obligations to customers and other market participants promptly. Such requirements also ensure the existence of a cushion against potential losses arising from market, credit and operational risks. Generally, these requirements apply only to the securities firm (i.e., not to the consolidated entity that includes the securities firm).

Under the US net capital rule, securities firms determine their minimum liquid asset (or net capital) requirement by first calculating their net worth according to US generally accepted accounting principles. This includes valuing securities and other financial instruments at their market prices. The next step is to add certain subordinated liabilities to net worth and subtract illiquid assets, such as furniture, equipment, buildings, and the value of exchange seats. Generally, unsecured receivables are also deducted from net worth. The remaining assets consisting of cash, securities, foreign currencies, and other financial instruments comprise what is referred to as the firm's "tentative net capital." The final step is to deduct from the tentative net capital specified percentages of the market values of these financial assets, taking into account certain hedged positions. The amounts of these deductions known as "haircuts" are based on the liquidity of the given asset. The haircut-adjusted value of the tentative net capital constitutes a broker-dealer's actual net capital for purposes of the rule.

Once a firm has determined the amount of its actual net capital, it must compare that figure with its required minimum to determine whether it is in compliance with the rule. A firm's required minimum is the greater of two amounts. The first amount is specified in the rule based on the type of business a firm engages in. Generally, the second amount is 2% of the firm's secured customer receivables. This latter amount is usually the greater amount (and therefore the requirement) for the largest US firms, which includes most of those carrying customer securities and cash. Accordingly, the minimum net capital amount for these firms is 2% of customer receivables. However, they are required to give notice ("early warning") when their net capital drops to a level that is below 5% of customer receivables. This results in an effective higher minimum requirement.

Treatment for OTC derivatives dealers

The US has also established a specialised regulatory framework for entities that deal exclusively in over-the-counter ("OTC") derivative products, such as swaps and long-dated options. Under this framework, OTC derivative dealers need not deduct 100% of their unsecured receivables from net worth when calculating net capital. Instead, they may take a charge to their capital based on the net replacement value of all outstanding transactions

¹³ The concept of "investment firms" refers to EU terminology. It is broader than the concept of "securities firms" and includes for instance, in addition to securities firms, all firms receiving, transmitting and executing orders in financial instruments on behalf of customers or for their own account on a professional basis, asset management and the underwriting of financial instruments.

with each counterparty (taking into account netting arrangements and possession of liquid collateral) multiplied by a factor derived from the creditworthiness of the counterparty.

In addition, rather than applying the haircuts prescribed in the net capital rule, they may calculate their deductions to tentative net capital using statistical models. Specifically, they may use either internally developed VAR models or an alternative method based on a theoretical option-pricing model. Firms choosing to use an internally developed VAR model to calculate market risk capital charges must demonstrate to the Commission that their model meets minimum qualitative and quantitative standards, including incorporation of VAR into the firm's daily risk management process, back testing to determine the precision of the model and continuous adjustment of the model. The total market risk charge is three times the higher of either the previous day's VAR estimate or the average of the VAR estimates calculated on the previous 60 business days.

Consolidation and international harmonisation

Typically, regulators using net capital approaches apply them on a solo basis to the regulated securities firm rather than on a consolidated basis. Because the goals of many securities firm regulators are focused primarily on the successful liquidation of the regulated firm and the protection of its customers, efforts have typically not been made to extend this capital regulation to the consolidated firm. In some countries, such as Canada, many of the largest securities firms are themselves subsidiaries of banking organisations subject to the Basel Accord on a consolidated basis. In EU countries, with some exceptions, the Capital Adequacy Directive for market risk is also applied on a consolidated basis to investment firms.

While the subject of a harmonised approach to securities firm capital regulation has come up from time to time within the IOSCO, the existence of two significant frameworks (that are quite different in terms of the details) has practically limited the prospect of an agreement on a single framework. Accordingly, there are no current projects within the IOSCO targeted to achieve such an outcome.

Insurance supervision

Primary objectives of insurance supervision

According to the International Association of Insurance Supervisors' (IAIS) core principles, the main goal of insurance supervision is "to maintain efficient, fair, safe and stable insurance markets for the benefit and protection of policyholders". In practice, this implies that the main goal of insurance supervision is to ensure that the interests of the insured are adequately safeguarded and the laws applicable to the operation of insurance business are observed.

Key elements of the supervision of insurance firms

Supervisory regimes use different techniques and practices in order to minimise the technical as well as the non-technical risks that could threaten the interests of the insured. These include (1) rules obliging insurance firms to build prudent technical provisions, (2) rules governing reinsurance, (3) rules governing the investment of assets, (4) reporting and on-site inspections, and (5) capital regulation. The relative emphasis on particular techniques differs across jurisdictions, as do relevant regulations.

(1) Technical provisions

As noted in Section II above, technical provisions are a critical means of addressing the risks associated with insurance contracts. Accordingly, insurance supervisors focus particularly on the adequacy of the provisions. Sufficient technical provisions must reflect the technical risks in order to ensure that the obligations of an insurance company can be fulfilled at any time. These provisions can be built through statistical methods, using the firm's own historical loss data and supplementing it by industry-wide statistics or on a case-to-case basis, the sum of individual case reserves being then used as a basis for establishing the overall technical provisions. In both cases, margins may be included in the calculations and further protections are provided under certain regimes through equalisation and catastrophe provisioning.

The supervisor's interest in the provisions is manifested in various ways in different jurisdictions. It can include one or more of the following: (1) prescribing the types of provisions which must be held, (2) prescribing assumptions to use in the calculation of the provisions, (3) prescribing methods to use in the calculation of the provisions, (4) requiring that the company engage an actuary or staff with similar expertise to oversee the calculation of the provisions, (5) requiring that the company obtain and file a statement from a qualified actuary as to the adequacy of the provisions, (6) requiring that the technical provisions be checked by external auditors. It is not uncommon for companies to hold provisions in excess of the standard required by their supervisor.

In general, it is the responsibility of the supervisor to ensure that the technical provisions being held satisfy the requirements of the jurisdiction. The review of technical provisions seeks to identify all the technical risks present and to find out at an early stage whether, for example, additional technical provisions or changes in the underwriting procedures are necessary. Ratios such as payment ratios (the ratio of claims payments to premiums) as well as provision ratios (the ratio of provisions to premiums) are studied by means of time series analyses and comparisons across the individual industries. An analysis can also be carried out to see whether the claims provisions set up for a certain year of loss occurrence have been sufficient to cover payments in the following years. The supervisory process includes making sure that the calculation methods are used in accordance with the principles of prudence.

(2) Rules governing reinsurance

Insurance supervisors focus on the reinsurance agreements of the primary insurers. Reinsurance should be placed with an appropriate number of reinsurers in order to ensure proper risk diversification. Supervisors also monitor that the primary insurers meet their responsibility to adequately control their reinsurers and reinsurance policy as a means of avoiding a poor quality of reinsurance. In some cases, jurisdictions also impose conditions on the ability of insurance companies to reduce technical provisions for risks covered by reinsurance, for instance through measures such as requiring collateral or letters of credit. Some jurisdictions also limit the credit that companies can take for overdue reinsurance and limit reinsurance accounting treatment to those transactions that contain true insurance risk transfer. The IAIS is currently developing approaches and principles related to the supervision of reinsurers.

(3) Rules governing the safety, profitability and diversification of investments

One objective of investment regulation is to monitor investment risk, consisting mainly of credit risk, market risk, depreciation risk, asset-liability matching risk, interest rate risk and liquidity risk. Regarding the investments of insurance companies, supervisors monitor that, in particular, the insurers invest in safe, profitable and well-diversified assets. Such rules play a key role for insurance supervisors in ensuring that the policyholders' claims may be fulfilled in accordance with the technical provisions made for them.

Many jurisdictions have catalogues of allowed investments, including any limitations with regard to different categories of assets, for example real estate, equity or loans and limits that apply to investments on the same debtor. The supervisors also monitor that, in the case of foreign currency liabilities, the companies invest in relevant currency matching assets. Under EU rules, there is no explicit capital charge for investment risk, because such a risk is implicitly part of the risks that are covered by technical provisions and because of the existence of strict investment regulation. However, in the US, there is an explicit charge for investment risk (or assets risk) that is measured as the weighted sum of assets in various classes, with the weights reflecting risk, similar to the concept used in the Basel Accord for banks.

(4) Reporting and on-site supervision

Annual reports and other forms of public reporting from insurance companies are used to monitor the results of the different categories of insurance that a company offers. Public reporting is particularly useful to show up any risks of insufficient tariffs and risks of major losses. Insurance supervisory authorities usually set out regulations for the detailed internal reports required from the supervised insurance companies on their business results and policy. In addition, insurance supervisors are entitled to ask insurers for any information deemed important from a supervisory perspective. The objectives of internal reporting are to highlight all kinds of technical and non-technical risks.

On-site inspections are one of the most efficient supervisory tools of insurance supervisors. On-site inspections enable insurance supervisors to assess, at the company's premises, whether a company complies with the regulatory requirements and whether the management follows a prudent insurance policy and fulfils its duties. They also offer the possibility of verifying the content of public and internal reporting. As for internal reporting, the objectives of on-site inspections are to reveal all kinds of technical and non-technical risks.

Insurance supervisors also seek to employ market forces by requiring sufficient disclosure so as to identify companies as strong or weak financially. In some jurisdictions this motivates companies to maintain their financial condition well in excess of regulatory minimum levels.

(5) Capital regulation

Capital or solvency regulations are also an important element of insurance supervision. However, it is important to emphasise that technical provisions play a proportionately larger role relative to capital than in the banking or securities sectors. As described earlier, the establishment of technical provisions for future policy benefits is a critical process in the core business activity of all insurance companies. Because of this mechanism, insurance companies generally have large technical provisions relative to capital. Thus, technical provisions play a larger role in the management of insurance risks relative to capital than is the case in the banking and securities sectors.

Capital regulations in the insurance sector differ across jurisdictions, although there are two primary models. These include the US risk-based capital (RBC) model, which is also followed in a similar form in Canada as well as Japan and other Asian countries, and the EU model.

The RBC regulatory model

The US Risk Based Capital (RBC) framework was adopted during the last decade through the efforts of the National Association of Insurance Commissioners (NAIC) in the United States to improve the quality and consistency of state regulation of insurance. The NAIC proposed to "raise the safety net" for policyholders by establishing a uniform regulatory

capital requirement that provided the authority and incentives for early intervention and that was related to the risks of an individual insurer's operations. The capital standard that was adopted is a threshold level of capital that identifies companies in need of regulatory attention. It is therefore not a benchmark for adequate capitalisation and is not intended to provide for ranking of insurance companies that operate above the threshold levels or to predict insolvencies.

There are three RBC formulas, each one applicable to a different type of insurance company.

- Life formula: life and health companies,
- P & C formula: property & casualty companies, and
- Health formula: managed care organisations and other health entities.

Each formula attempts to produce a result that is sensitive to the operations and risk profile of the individual company. Each is composed of a series of worksheets, whereby values, largely taken from the company's statutory statement and pertaining to risk exposure, are multiplied by NAIC specified factors to produce a minimum capital level. Various risks are addressed in turn and in many cases, the resulting capital amounts are modified to adjust for individual company experience or operations. For example, the life formula contains adjustments to make the formulas sensitive to individual company circumstances in the areas of asset concentration, mortgage loan foreclosure experience, and bond portfolio diversification. Other such adjustments are contained in the life and the other formulas as well.

Another feature of these formulas is that they incorporate a diversification adjustment when the capital amounts for the separate risks are combined to produce a total. This adjustment recognises the fact that the capital needed for independent risks is less than the sum of the capital for each separate risk. Since independent risks are unlikely to produce maximum losses simultaneously, the total capital required to protect against losses from all risks is less than the sum of the individual amounts. Therefore the total amount produced by the formulas is not equal to the sum of the capital for the individual risk components, but is less.

Fifty percent of the minimum capital amount produced by the formula is known as the company's authorised control level (ACL). The total adjusted capital (TAC) corresponds to the firm's filed statutory annual statement capital with some adjustments. To apply the RBC test to check whether the company has the minimum amount of capital or needs regulatory attention, the TAC is compared with the ACL.

Insurance firms are expected to operate with a TAC of more than 200% of the ACL. When such is the case, they are not generally subject to regulatory action. Below 200%, a progressive series of steps are prescribed. They range from requiring the company to take remedial action, when the TAC is between 150% and 200% of ACL, to the possibility of regulatory take-over when TAC reaches 100% of the ACL and the near certainty of regulatory take over when it is below 70% of ACL. Highly rated insurance firms tend to operate with a TAC equal to several multiples of their ACL, often three to four times.

The RBC test is applied to each individual company, rather than on a group or consolidated basis. State insurance regulators in the US have very limited control over the assets of affiliated insurance companies that are not domiciled in their state. In general, the affiliated company is under no legal obligation to provide support. However, the RBC formulas do fully incorporate without diversification relief, investments in subsidiaries and affiliates. This avoids any incentives for insurance groups to move assets between subsidiaries for RBC formula advantage.

The EU insurance solvency regulations

EU regulations ensuring the adequacy of technical provisions and rules applicable to investments covering the technical provisions aim essentially at limiting technical and investment risks. In addition, the solvency regulations included in the relevant EU directives are intended to provide sufficient capital to cover the remaining risks (mainly non-technical risks). It should also be noted that the EU is currently in the early stages of a review of insurance company solvency requirements.

Within the EU regulations for capital, the amount of capital that must be held by the insurance firm (i.e., the solvency margin) is derived from objective criteria that are related to the overall volume of business (premiums and claims for non-life insurance, mainly mathematical provisions and capital at risk for life insurance). The central idea is that firms of the same size are placed on an equal competitive footing.

The basic approach of the EU solvency regulations is a comparison of the “solvency requirements” with “eligible solvency elements”. The regulations prescribe that the latter must equal or exceed the former. The relevant EU directives are designed as minimum regulations, therefore implying that Member states may apply more stringent regulations.

Under the EU regulations, the eligible solvency elements mainly consist of paid-in share capital and reserves (statutory reserves and free reserves) not corresponding to underwriting liabilities (or equivalent concepts for mutual or other companies).

The EU solvency margin for non-life insurers is in general based on either the annual amount of premiums or the average claim experience over the past three years. In each case, there is a specific calculation that translates the premium or claims data into a solvency margin. The relevant solvency margin is the higher of the two resulting numbers. In addition, the higher of the two calculations must not be lower than a certain minimum level. For most types of life insurance, the EU solvency requirement is computed as a fraction of the technical provisions plus a fraction of the capital at risk (in general computed as the total insured amount minus technical provisions). It must not be lower than a certain minimum level.

As mentioned above, EU regulations do not contain specific solvency requirements associated with investment risks. These risks are explicitly addressed by rules governing assets and covering technical provisions (eligibility, diversification, quantitative limits, and valuation principles) whose purpose is to limit the potential for investment losses.

The EU insurance solvency regulations are generally applied on a solo level. A separate supplementary EU regulation (“solo-plus”) will be applicable to primary insurers that are part of an insurance group, starting in 2002 for the financial year 2001. “Plus” in this context means that not only one insurance company, but also all other companies like insurance companies and reinsurance companies that are part of the same group must be taken into account in the calculation. The objective is to eliminate double leverage and intra-group creation of capital. Three methods (similar to the three approaches outlined in the Joint Forum’s “Capital Adequacy Principles” paper) are available to calculate the so-called adjusted solvency. The solo plus calculations are similar to the solo solvency calculations, but additional restrictions apply to the elements eligible for the solvency margin. Another element of this regulation is that intra-group transactions must be reported.

Treatment of reinsurers

In several jurisdictions such as the United States, Canada, Japan, and the UK, reinsurance companies are regulated essentially in the same way as primary insurers. In these

jurisdictions the same rules regarding technical provisions, investment regulation and capital requirements apply. In many jurisdictions however, reinsurance companies are supervised to a lesser degree. The rationale behind this approach is that insurance supervisors are concerned with protecting policyholders. In reinsurance arrangements, the contracting parties are primary insurers; they should be sufficiently knowledgeable and need no protection.

In these jurisdictions reinsurance companies are indirectly supervised with insurance supervisors focusing on the reinsurance agreements of the primary insurers. In particular, they seek to ensure that the primary insurers have diversified their risks by placing contracts with an appropriate number of reinsurers. Also, they expect primary insurers to constantly monitor their reinsurance policies and the quality of the reinsurers with whom they deal. This is done in part by ensuring the reinsurer has adequate technical provisions. In most jurisdictions, primary insurers report their technical provisions net of reinsurance and take credit for reinsurance when calculating their solvency requirements. At the same time, reinsurance companies are expected to establish sufficient technical provisions to cover the risks that have been transferred to them.

Developing principles and standards on reinsurance supervision is one of the highest priorities of the IAIS. The goal is to reach a more harmonised approach in reinsurance supervision. As a first step, the IAIS has developed a supervisory standard on indirect supervision of reinsurance, which should be ready for approval by the membership at the General Meeting in September 2001. In addition, the IAIS has begun developing a set of principles on direct supervision of reinsurance companies.

International harmonisation of insurance capital regulation

The IAIS is a relatively new organisation and has not yet established a common approach to insurance capital regulation. There are formidable obstacles to achieving such an objective, since insurance accounting standards and approaches to the calculation of technical provisions also differ significantly across jurisdictions. Nevertheless, the IAIS has been working on efforts to compare capital regulations across jurisdictions and foresees that its work might eventually form the basis for greater convergence.

Conglomerate regulation

Historically, jurisdictions have not applied specific regulations to financial conglomerates. However, as a result of recent financial market developments, the EU has undertaken to develop a set of minimum regulations applicable to firms within financial conglomerates. These regulations are intended to apply to all financial firms operating within the EU that meet various conditions and are spelled out in a proposed EU Directive (IP/01/609) issued on April 26, 2001. A main objective of the proposed Directive is to eliminate double leverage and intra-group creation of capital between firms that are part of the financial conglomerate. Additionally, intra-group transactions and risk concentrations must be monitored, measured, and reported to the supervisory authority. It also seeks to provide a group-wide assessment of risks. The primary approaches embodied in the Directive are the three variants of the so-called Joint Forum methods as outlined in the Joint Forum's "Capital Adequacy Principles" paper.

Comparing capital regulations across sectors

This subsection considers the issues that arise in attempting to compare capital regulations across the different sectors. There are significant barriers to making specific point-by-point

comparisons across the frameworks. Rather, there are sufficiently many differences between the different approaches that it becomes difficult to assess the particular importance of any single difference that may exist. The key difficulties in comparing the different frameworks can be grouped into several categories.

- (1) Differences in accounting rules between sectors and across jurisdictions.
- (2) Differences in the relative importance of capital and provisions across sectors.
- (3) Differences in the definition of capital across sectors.
- (4) Inherent and conceptual differences in calculation methodologies and risks
- (5) Differences in the scope of application of the capital requirements.
- (6) Differences in observed relationships between actual capital and minimum capital.

(1) *Differences in accounting rules between sectors and across jurisdictions*

Accounting conventions have different requirements across sectors that complicate comparisons across the various capital frameworks. For example, financial assets held by securities firms and in some cases by banks and insurance firms (e.g., equities in the US) must be marked-to-market. However, the majority of assets held by banks and insurance companies are not marked to market (although the situation for insurance companies varies across jurisdictions). Moreover, in some cases in both of these sectors it is possible to count a portion of the difference between current value and book value as eligible capital. It is not straightforward to weigh the benefits and costs that arise from mark to market accounting requirements against the differences that may exist in the capital treatment of various asset categories. On the one hand, marking to market implies that valuation gains are immediately reflected in full in equity capital. On the other hand, the same is true of valuation losses.

Clearly, the accounting requirements applied in the different sectors reflect to some extent the underlying time horizons associated with particular business lines, as discussed earlier in the section. In other words, the time horizons over which risk may be most relevant could differ across the sectors. Therefore, the question arises whether the need for capital could differ as well, given that the relationship between the volatility and expected return associated with particular risks is known to differ depending on the particular time horizon chosen for the comparison. To the extent that differences in accounting requirements reflect fundamental differences in the relevant time horizons for evaluating risk, it could be inappropriate to draw conclusions about the relative stringency of capital requirements across the sectors. That is, it would be necessary to evaluate the conservatism of the various capital requirements relative to the most relevant time horizon for evaluating the risks that they are attempting to cover before seeking to make such comparisons.

Naturally, other differences in accounting treatment also inhibit the ability to make highly specific comparisons. These include differences in the definitions of different classes of provisions, differences in the definition of various types of capital elements, and differences in how income is defined. Of course, differential tax treatment of some of these items could also affect the relative stringency of the different capital frameworks. In this regard, it would be impractical to carry out an analysis that sought to disentangle each of the specific differences in accounting and tax treatment and their implications for a relative comparison of the various capital approaches.

(2) *Differences in the relative importance of capital and provisions*

As described earlier in this section, there are significant differences across the three sectors in the role of capital and provisions or reserves. These differences can also arise in some

cases when comparing firms operating in the same sector but in various jurisdictions. Again, these differences make it difficult to perform overall comparisons of the relevant capital regimes because they imply that the capital frameworks form only a part, and in some cases a minor part, of the overall cushion that exists to protect against unexpected losses.

For securities firms, capital is the primary cushion against losses arising from market, operational and credit risks. Securities firms generally may not establish general reserves for “expected” losses, although they do record loss contingencies for probable losses due to pending litigation.¹⁴

The situation is different for banks where capital is supplemented by loan loss reserves that are also available to help cover potential credit losses. However, the extent to which capital represents the main cushion for banks against losses tends to vary across jurisdictions according to the accounting and tax requirements associated with loan loss reserves.

For example, banks from jurisdictions that allow loans to be written off completely have no need to hold reserves against loans that are removed from their balance sheet. In other words, such banks hold reserves only against loans with partial losses, so that the balance sheet shows the proper net value of these loans. However, other jurisdictions prevent banks from writing off loans from the balance sheet unless the loss is deemed certain. Banks from these jurisdictions are therefore obliged to hold loan loss reserves against these loans until all legal actions are extinguished. The balance sheets of such banks will therefore show a significantly higher proportion of loan loss reserves to capital when compared to banks that can write off such loans completely.

As discussed above, technical provisions make up the largest portion of the cushion for paying potential claims (policy benefits) for insurance firms, accounting for around 80% per cent of a life insurer’s liabilities and about half or more of a non-life insurer’s liabilities (see the stylised balance sheets in Annex 2). Technical provisions in life insurance consist primarily of active policy provisions/mathematical provisions (about 70 per cent of the liabilities), provisions for bonuses and rebates (about 9 per cent) and unearned premium provisions (about 1 per cent).

For non-life insurance firms in most jurisdictions, technical provisions (provisions for claims outstanding) are in general not made until an insured event has occurred. At the end of the fiscal year the amount of technical provisions must be estimated using statistical methods and/or the case-by-case method. Some supervisory regimes encompass the obligation for non-life insurance insurers to build additional technical provisions as buffers for catastrophe events and equalisation purposes. The idea of catastrophe provisions is to largely eliminate the effect of catastrophes (like natural disasters). The purpose of the equalisation provision is to equalise fluctuations in the loss pattern of future years. When having these types of provisions, the relative importance of capital is additionally reduced as shown in the stylised balance sheet provided as an example in Annex 2. In this example, drawn from a jurisdiction where such equalisation provisions are possible, technical provisions for non-life insurance firms consist primarily of provisions for claims outstanding (about 40 per cent), equalisation provisions and similar provisions (about 9 per cent) and unearned premium provisions (about 5 per cent).

¹⁴ Securities firms in the US and other jurisdictions may not establish general reserves. However, legislation in the EU explicitly provides for the possibility of establishing such general reserves at securities firms.

More broadly, the reliance on capital in insurance activities can vary significantly among companies, jurisdictions and insurance activities. During the accounting period, the premium revenue, investment income, and asset maturities provide funding while claims and expense payments require funding. Also, from the start of the period to the end of the period the various technical provisions will either increase or decrease. Overall a net decrease will provide funding while a net increase will require funding. Capital will be used if the total funding required for the various uses exceeds the total funding provided.

In summary, there are significant differences in regulatory capital requirements in the different sectors. These differences exist both between sectors as well as across jurisdictions. In many cases, these differences are related to variations in the requirements and practices concerning levels of provisions or reserves and in accounting standards more generally. The extent of such variations within a given sector is also linked to the degree of international harmonisation that has been reached on capital and provisioning or reserving practices. Finally, when considering the relative importance of provisions/reserves and capital for covering exposures, it is important to recognise that capital regulations and solvency requirements in the banking and securities sector tend to focus on the primary risks facing each sector. For example, capital regulations for the banking sector focus largely on credit risk. Capital regulations for securities firms emphasise market and liquidity risk (while also covering credit and operational risk). Solvency requirements in the insurance sector address primarily the remaining risks that may not be covered through prior risk limitation and risk mitigation techniques. In the insurance sector, capital therefore plays the role of an ultimate buffer against losses arising from all kinds of remaining risks.

(3) Differences in the definition of capital across sectors

Differences in the definition of capital across sectors can also make it difficult to make comparisons in regard to the regulations for capital. Such differences arise when comparing eligible elements for capital regulation purposes and required deductions from capital.

Eligible core capital for capital regulation is generally comprised of equity capital and disclosed reserves in all three sectors. However, the conditions providing for their eligibility tend to vary between sectors but also between jurisdictions in the same sector. This last set of differences is significant in the insurance sector but also, to a lesser extent, in the securities firms sector, where at least two conceptually different approaches are taken among the G-10 countries.

For banks, eligible core capital (tier one) elements are comprised primarily of equity capital and disclosed reserves but also include certain hybrid debt/equity instruments under strict conditions. Equity capital has to be issued and fully paid. Disclosed reserves are essentially comprised of retained profits and general and legal reserves. Eligible supplementary (tier two) capital elements include undisclosed reserves, reevaluation reserves, such as those arising from the revaluation of their own premises, a fraction of hidden reserves resulting of long-term holdings of equity securities valued at their cost of acquisition, general loan-loss provisions (up to a defined threshold), and subordinated debt instruments under specific conditions.

Eligible elements for core capital in insurance activities in the EU bear a number of differences when compared to those for banks. Equity capital is comprised of the paid-up share capital but can also include up to one-half of the unpaid share capital or initial funding once 25% of such capital or fund are paid up. Under certain conditions, eligible solvency elements will also include cumulative preferred shares and subordinated debt. The conditions for including cumulative preferred shares and subordinated debt are largely similar to those for banks under supplementary capital requirements. Another specificity, allowed for life-insurance companies only, is the possibility to include profit reserves appearing in the

balance sheet where they may be used to cover any losses which may arise and where they have not been made available for distribution to policy-holders.

Eligible capital elements under the US RBC framework for insurance activities (Total Adjusted Capital) are mainly based on a financial statutory statement that the company has to file with its supervisor. This statement is itself based on statutory accounting rules that differ from US GAAP (generally accepted accounting principles) and is oriented towards a more conservative balance sheet by generally understating assets (not admitting certain illiquid assets, for instance furniture and equipment) and overstating liabilities (for instance technical provisions will contain margins for adverse deviations). There are a number of adjustments made by adding or subtracting elements. For instance, in addition to equity and retained earnings, recognition is given to the conservatism in surplus that result from statutory accounting rules (e.g., the addition of the asset valuation reserve which is reported as a statutory liability but is actually a type of assigned surplus). Adjustments are also made for differences in the accounting treatment relating to the discounting of technical provisions and for recognising capital notes under certain conditions.

For securities firms subject to net capital rules, the list of eligible capital elements is generally much shorter than for banks and insurance firms. For example, under the net capital framework for US securities firms, capital consists of net worth (i.e., ownership equity and preferred stock that is not maturing within a year) plus certain subordinated liabilities. The balance sheets of these firms do not contain any hidden or undisclosed reserves that must be taken into consideration. Subordinated loans are added back to net worth only if certain conditions are met, including that the term of the loan exceeds one year and that the loan documentation clearly provides that the lender's claim against the firm is legally subordinated to those of other creditors.

In the EU framework for securities firms, eligible elements for regulatory capital purposes are the same as those allowed for banks in the Basel Accord.

(4) *Inherent and conceptual differences in calculation methodologies and risks*

There are also inherent conceptual differences in the calculation methodologies that increase the difficulties when trying to compare the impact of capital regulations on a specific class of assets. For example, for those approaches to insurance capital regulation that allow for a diversification benefit (i.e., RBC-based approaches), there is no constant marginal capital requirement for a particular asset. Instead, the marginal charge depends on the firm's portfolio as well as other components of the capital requirements. There may also be inherent differences in risk across jurisdictions, which influences the need for capital requirements. For example, the extent of potential catastrophic losses for non-life insurance firms (resulting from earthquakes for instance) likely differs across geographic locations.

Attempting to compare and assess the effects of regulatory capital frameworks for particular asset types is difficult because the capital basis for such comparisons are dissimilar across sectors and also within a given sector, especially for securities firms and insurance firms. For example, it is not clear how to balance a higher asset requirement in one sector versus a more stringent definition of eligible capital in another. In addition, requirements linked to specific classes of assets are difficult to compare because they do not have the same purposes. For instance, under US net capital rules for securities firms, factors applied to asset values are primarily designed to reflect potential changes in value from market and credit risks arising in a liquidation scenario. On the other hand, when applied to banks or securities firms in the EU, such factors are intended to reflect market risks and credit risk, but perhaps over a somewhat different time horizon.

A comparison of the treatment of bonds across the different frameworks illustrates some of these differences.

Under the Basel Accord, bonds are treated either as part of the trading book, assuming they are liquid, or as part of the banking book. If considered part of the trading book, the capital charge on the bond will be the sum of the general market risk of the position and of the specific counterparty risk of such a position, which is related to its sector and to whether it is rated investment grade or not. Such a treatment will also be applied to calculate regulatory capital charges for EU securities firms. When applied to positions in the banking book (i.e., not traded but held to maturity), the bond will not be marked to market and the capital charge will essentially be a credit risk charge based on the sector of the borrower.

However, when applying the US net capital rule, the factor applied to the bond position is based on the instrument's liquidity. The factor (or haircut) is intended to account for potential decreases in the bond's value during a liquidation scenario. The goal is to ensure that the firm maintains a level of liquidity sufficient to meet its obligations to customers and other market participants.

Insurance capital regulations are also different. Under the life formula of the RBC model, bonds are divided into 6 quality classes with a different factor for each reflecting the credit risk from fixed income investments. While such requirements are somewhat similar to Basel rules for banking book exposures, they bear significant differences. The quality classes are standardised according to risk whereas the current Basel Accord essentially distinguishes according to the category of the issuer (sovereign, bank or corporate). The proposed revisions to the Basel Accord will allow either for bank's own estimates using internal ratings based approaches or for risk-weighting the bond according to its external credit rating. In addition, the result for a bond portfolio under the RBC model will be modified by size factors reflecting concentration risk and will be subject to diversification offsets with other risk factors addressed by the RBC approach.

The EU capital regulation for insurance companies does not consider assets when defining capital requirements. Instead, the formulas are based on objective criteria that are related to the overall volume of business (premiums and claims for non-life insurers, mainly mathematical provisions and capital at risk for life insurers). As noted, the goal of this approach is to place firms of the same size on an equal competitive footing. The risk resulting from investments are directly limited through supervisory rules. Therefore there are no specific capital charges or even factors related directly to any given class of assets under such a framework.

(5) *Differences in the scope of application of the capital requirements*

The focus of banks' capital requirements is on consolidated supervision, in order to eliminate double gearing but also because banking groups have become increasingly international. The revised Basel Accord is expected to enlarge this focus, allowing for bank holding companies to be included in the consolidation but also providing for multiple levels of sub-consolidation and solo tests, if necessary. Capital regulation for insurance is generally applied on a solo level, both in the US and the EU models. However, recognition of risks arising from subsidiaries and affiliates is incorporated in the RBC model. In addition, methodologies allowing for capital aggregation while eliminating double gearing through the calculation of the firm's adjusted solvency is currently provided under the EU solo plus framework for insurance groups. Capital regulation for securities firms under the net capital approach is typically applied only on a solo basis, for example in the US. On the other hand, securities firms are generally subject to consolidation (with some exceptions) in the EU.

(6) Differences in the observed relationship between actual capital and minimum capital

The application of capital regulations, even when based on internationally agreed standards may differ between jurisdictions because such standards function solely as minimum requirements. That is, firms in different sectors may operate with different cushions of actual capital relative to the minimum requirements. In practice, the level of actual capital held by firms relative to their capital requirements reflects a set of expectations that exist in the marketplace regarding the relationship of financial condition to capital requirements in a particular sector.

For example, rating agencies and market analysts have a significant role in determining the degree to which a firm is considered financially strong and have developed their own capital formulas for assessing the relationship of a firm's actual capital relative to its minimum requirement. Given these constraints, firms make their own decisions about how much capital to hold at least partly in response to market expectations about how much capital would be required to achieve a certain credit rating or other measure of financial strength. In other words, while the structure of the capital framework in each sector is undoubtedly important, it does not by itself determine the level of capital that firms in each sector choose to hold.

In addition to market expectations, supervisors themselves in many cases encourage firms to hold capital above minimum levels. For example, some bank supervisors set well-capitalised thresholds above the minimum standards. That is, they expect banks to operate with capital ratios of at least 6% for tier one and 10% for the total capital ratio compared to minimum requirements of 4% and 8% respectively. In other jurisdictions, supervisors set specific customised capital requirements above the minimum level that are linked to the institutions' risk profile. Other instances for imposing requirements that exceed the minimum standards can be found in the net capital rules for securities firms and in the RBC approach for insurance capital. In both cases, trigger ratios above minimum requirements are set to allow for early intervention and, if necessary, prompt corrective action at an early stage.

There are however, some differences across sectors in the relationships of actual capital to minimum regulatory capital. Although an exhaustive study of this issue was not conducted, an attempt was made to compare the ratios of actual capital to required capital for a sample of US firms operating within the three sectors.¹⁵ Such a comparison is straightforward for banks where such a ratio is simply a rescaling of the Basel capital ratios. Similarly, for US insurance companies, it is possible to look at firms' adjusted capital levels relative to both the authorised control level (ACL) capital and to the company-action capital level (200% of ACL). For US securities firms, however, the nature of the net capital requirements makes such a ratio-based comparison more difficult.

Because the net capital of a US securities firm is calculated by starting with net worth and adding subordinated debt and subtracting illiquid assets and haircuts on other assets, it would not be appropriate to compare the ratio of actual net capital to required net capital with the ratios for banks and insurance companies. Doing so would ignore the fact that the bulk of the net capital requirements are in fact derived from the haircuts and deductions for illiquid assets. Therefore the comparisons for US securities firms shown here are based on calculations where actual capital is defined as equity capital plus subordinated debt and

¹⁵ The sample consists of 1,651 US domestic bank holding companies, 654 US broker-dealers, 484 US life insurers, and 1,748 P&C insurers.

required capital is defined as required net capital plus the value of haircuts and deductions for illiquid assets.

Focusing on large firms (i.e., those with assets exceeding \$1 billion), the results suggest that banks typically operate with capital levels between 1.3 and 1.8 times required capital. Similarly, securities firms operate with capital levels between 1.2 and 2.2 times required capital (defined as described in the previous paragraph), with the very largest firms concentrated in the range from 1.2 to 1.4. If warning level capital is used instead of required net capital, then the corresponding ratio range from 1.2 to 1.9 for securities firms, with the very largest firms concentrated in the range from 1.2 to 1.3. For the insurance companies, figures that define required capital as ACL capital imply that both life insurance and property and casualty insurance companies typically hold more than five times required capital. However, it may be more appropriate for the purpose of comparison to define required capital as 200% of the ACL, since this is the point at which insurance companies would be expected to take action to improve capital levels. On this basis, life insurance companies tend to hold capital of between two and three times the company-action level (200% of ACL), while P&C companies tend to hold capital between two and four times this level.

The ratios for insurance companies are consistent with the expectations of such firms in the EU as well. That is, it does appear more common for insurance companies generally to operate with actual capital levels that are a higher proportion of regulatory minimums than in the banking and securities sector. This is consistent with the fact that such requirements are clearly seen as minimum requirements and not as levels that are characteristic of well-capitalised firms.

While the results presented here are only suggestive and not definitive, they do indicate the need for caution in making direct comparisons of the specific capital requirements on different categories of risk. For example, it would be misleading to focus solely on the magnitude of capital requirements on similar assets across sectors if there are large and significant differences in the amounts of capital that firms tend to hold relative to their capital requirements.

Cross-sectoral risk transfer

For the reasons outlined above, it has not, for example, been developed a table setting out specific comparisons between the minimum regulatory capital charges for a range of particular products. A straightforward comparison of the specific charges likely would be misleading because it would fail to take into account some of the crucial differences in the frameworks that have just been outlined. On the other hand, attempting to make adjustments for each of these factors in order put the comparisons on an equivalent basis would entail a range of subjective judgements about the importance of particular factors. The Joint Forum does not believe that such an effort would produce a credible or worthwhile result.

The Joint Forum is aware of the substantial interest in considering the implications of differences in capital regulation on the incentives to undertake cross sectoral risk transfers. It is clear that there are a number of factors that have contributed to the growth of such transfers. For example, progressive integration of the financial services industry and the development of new financial instruments have encouraged a variety of risk transfers between sectors. It was not attempted to systematically collect data on the scale of such transfers or the underlying motivations. Nevertheless, the analysis of risk management and capital frameworks in the different sectors may be helpful in considering the issues associated with cross-sectoral risk transfers.

When looking at cross-sectoral risk transfers, it is important to separate the perspective of the transferor from the perspective of the transferee. Transferors typically seek to transfer risks that they take on as part or a consequence of their core business activities. Their incentives to transfer risks will depend on a variety of factors including the cost of transferring or hedging the risk relative to the cost of retaining the risk on their own balance sheet. The regulatory capital treatment of risk can obviously influence the cost of retaining risk, particularly if the regulatory capital cost is above what the firm believes is the appropriate amount of economic capital to hold against the risk. In this fashion, regulatory capital requirements can create incentives for well-managed firms to transfer risks outside their sector.

From the perspective of the transferee, the key factors in determining whether to accept a given risk will include an evaluation of the underlying risk-return trade-off, consistency with overall business strategies, and the existence of legal or regulatory barriers to taking on the risk. Clearly, if regulatory capital requirements on the risks are high relative to the firm's own calculations of risk, then the firm may choose not to accept various risks. However if the risk is not subject to regulatory capital requirements or such requirements are too lenient, it is not clear that such a firm will automatically have an incentive to take on the relevant risk. If the firm is well managed and evaluates risks prudently, then it will ensure that it has the appropriate risk management systems to adequately measure the risk and appropriate economic capital to support such risk, even if regulatory capital standards are low. On the other hand, if the firm's internal assessment underestimates the risk, then it may see the lack of robust capital requirements as an additional opportunity to boost return on equity.

This suggests there is a need to seek to ensure that firms in the various sectors are taking a prudent approach to the management of risks that they are taking on from other sectors. Consistent with this conclusion is the increasing need for supervisors in the different sectors to share information on risk management practices and techniques. Such arrangements can help alert supervisors to particular vulnerabilities related to risks with which they are less familiar and help supervisors to develop appropriate monitoring regimes as firms increase the degree of cross-sectoral risk transfer.

A particularly important instance of cross-sectoral risk transfer can occur when the transferor and the transferee are separate legal entities of the same conglomerate firm. It is natural for such firms to conduct an analysis of the costs and benefits of booking transactions in various legal entities. Key factors in such an analysis are legal and tax considerations, accounting conventions, and regulatory requirements. Since a firm in this position has already decided to take on the relevant risk, the potential for different regulatory capital treatment may create an incentive to book transactions in one vehicle over another. For this reason, incentives to engage in regulatory capital arbitrage may be more important in their effects within firms than across firms.

These general points about cross-sectoral risk transfer are illustrated in relation to the primary risk areas discussed in this report.

In the area of market risk, banks and securities firms have both been active participants in securities and derivatives markets. Traded market risks are therefore transferred quite extensively between these sectors, driven largely by the strategic business rationales that each type of firm has seen for participating in these markets. The active participation of both banks and securities firms in the OTC derivatives market has continued despite some significant differences in the regulatory capital treatments for such instruments in the Basel framework for banks relative to the net capital framework for securities firms.

That is not to say that these differences in capital treatment have had no impact. Many securities firms have elected to book OTC derivative activity through subsidiaries subject to

the Basel capital framework rather than the net capital framework. As noted above, the SEC has recently introduced a specialised capital framework for OTC derivative dealers. This example illustrates the point that regulatory capital rules can create incentives to shift activities among legal entities within firms. A second point to note in this example is that firms may react to differences in capital treatment without creating significant regulatory concerns. At heart, the critical issues are whether the firms engaged in these businesses are themselves applying appropriate risk management techniques and controls, and whether they are holding sufficient capital to support these risks. Multiple supervisory and capital frameworks may produce equally valid answers to both questions.

The same points are also applicable to the cross-sectoral transfer of credit and insurance risks. In this regard, the main mechanisms include securitization, credit derivatives, and alternative risk transfer (“ART”). Risks may also be taken on in more traditional ways, which change the composition of risks within sectors, such as insurance companies increasingly acquiring credit exposure through credit insurance.

Securitization and credit derivatives have generally been seen as mechanisms for risks originating within the banking sector to be transferred to other parties. In a securitization, bank exposure to credit risk is transferred into a vehicle that issues securities to a broad array of holders. Securities firms (as well as banks’ securities affiliates) underwrite and make markets in these instruments. Insurance companies are among the buyers of such securities either directly or as assets of funds under management, such as pension funds. They may also be involved through the provision of credit enhancements. Credit derivatives provide for the direct exchange of credit risk between counterparties without requiring the transfer of the assets (i.e., loans) that give rise to such exposure. Again, banks are the primary purchasers of credit protection, with both banks and securities firms acting as intermediaries. The sellers of credit protection include insurance companies as well as banks and other market participants.

The incentives for sellers of credit risk (protection buyers) include freeing up capital and funds for new business, taking advantage of pricing differentials, balance-sheet management, diversification of risk, and receivables management. Credit risk transfer mechanisms can reduce a bank’s need for both economic capital and for regulatory capital. Moreover, the increasing liquidity and sophistication of the available products allow for a highly flexible approach to modifying risk profiles. In particular, the increasing popularity of these tools is almost certainly linked to their capability to reduce risk concentrations.

Before the advent of credit risk transfer products, banks were largely unable to actively manage the credit risks embedded in their loan portfolios. Using these products, banks can now manage exposures per counterparty, per sector and per geographic area on a world-wide basis, regardless of the instruments being used (securities, loans or off-balance sheet items). Such risk-transfer instruments can also be used for risk arbitrage purposes and favour better capital allocations in the sense that they offer the possibility to sell off some risks, therefore freeing capital to take on other risks better suited to the institution’s objective.

From the perspective of the credit risk protection seller, the benefits of the transaction may include an attractive risk/return relationship, particularly when the benefits of risk diversification are incorporated. For example, for firms that do not currently hold significant amounts of credit risk, selling credit risk protection may increase their aggregate risk profile by less than it could decrease that of the protection buyer, who likely has a significant amount of existing credit exposure. Market participants also suggest that some firms have been encouraged to participate as sellers of credit protection because of a pattern of low returns in their traditional business lines and the need to deploy existing capital more productively.

Certain elements of the existing Basel Accord have been seen by many firms to require more regulatory capital than necessary for the relevant risk, leading such firms to transfer these risks to other market participants. For example, loans to very high quality corporate borrowers have been securitized or otherwise transferred by firms that believe the current capital treatment on such loans is too stringent. In this sense, regulatory requirements likely have contributed to cross-sectoral risk transfers. This is one of the reasons why the Basel Committee has been seeking to develop a more risk-sensitive capital framework for credit risk. To the extent that new capital requirements are more consistent with firms' internal views of risk, the incentive to transfer risks that are treated excessively under the regulatory framework should diminish.

It is important to note that a more risk-sensitive framework could substantially increase the capital requirement on high-risk assets. Whether this will create an incentive for firms to transfer such risks is not clear. If the requirements remain consistent with firms' internal assessments of such risks and the risks are priced to provide a reasonable return, then it is not obvious that firms will have a strong incentive to transfer such risks. On the other hand, if market participants from other sectors are willing to bear such risks while devoting less economic capital than is required under the new Basel Accord, then it is more likely that such risks will flow toward those market participants. This further underscores the need to ensure that all market participants take a sufficiently prudent view of the relevant risks.

There is also a growing market for the transfer of insurance risks although a survey was not conducted to identify precisely the size and the rate of growth of such a market. Alternative risk transfer is a broad term that includes the securitization of insurance risk and captive insurance companies. Primary examples include insurance products packaged as capital markets instruments, such as weather derivatives and catastrophe bonds or financial reinsurance contracts offering coverage for some elements of operational risk. Needless to say, the transfer of insurance risk by insurance companies in the form of reinsurance has long been an important element of the insurance sector. These new products provide additional means to transfer such risks using products that are somewhat more familiar to other capital markets participants. The motivation for non-insurers (such as banks and securities firms) to participate in these markets is again the prospect of an attractive risk/return relationship, potentially enhanced by the fact that their existing risk profile is largely uncorrelated with insurance risks.

The question of whether capital arbitrage plays a significant role in creating incentives for cross-sectoral risk transfers is not straightforward. On the one hand, there are clear differences in the capital frameworks between the three sectors, as discussed above. While precise comparisons between the frameworks are difficult, certain significant differences stand out in this context. The frameworks for banking and securities firms essentially ignore insurance risks, while the EU solvency regime for insurers treats investment risks through limitations on permitted investments rather than through capital requirements. Nevertheless, it is clear that capital arbitrage cannot be the only factor at work in encouraging cross-sectoral risk transfers.

For the "transferees" to take on new non-traditional risks, the risk/return trade off must be perceived to be attractive, regardless of the regulatory capital treatment. This can occur either because the firm is measuring the risk correctly and the trade off truly is attractive or because the firm is underestimating the true risk. In the former case, there is no reason for supervisory concern, while in the latter case, the regulatory capital framework is not itself the underlying problem.

Insurance companies that purchase securitizations and provide credit protection through credit derivatives do so at least in part because they see economic value to participating in the transaction. Even if their regulatory framework does not explicitly address the particular

risks involved to the same extent as the bank capital framework does, these firms are subject to the constraints of market discipline and typically need to justify significant new business directions to a variety of market analysts. Moreover, the fact that these activities are expanding now during a time of growing awareness of the importance of risk diversification, while the relevant capital frameworks have been in place for some time, suggests that cross-sectoral capital arbitrage is not the primary factor drawing firms to explore participation in a wider range of risk markets.

This suggests that to the degree that there are diversification benefits to holding multiple types of risks, then a further expansion in cross-sectoral risk transfer over time can be expected. To some extent, growth in the supply of willing “transferees” should be related to the development of analytically sound techniques for estimating the degree of diversification between different risk categories. In the meantime, it is possible that the most aggressive participants in these markets are those firms that internally estimate the largest benefits from such risk diversification.

From a supervisory perspective, it is worth emphasising again that the dominant concern associated with cross-sectoral risk transfers is whether the firms that are taking on the new risks, whether credit- or insurance-related, have in place the necessary and adequate risk management and measurement systems to support these activities. As these activities grow in size, this will become a more important question that individual supervisors will need to address carefully. The Joint Forum encourages further efforts, such as those now underway by the IAIS, to monitor the level of activity and the state of risk management practices in non-traditional areas within each sector. In addition, the Joint Forum strongly endorses the need to share information among supervisors in the different sectors to ensure that the supervision of non-traditional risks keeps pace with the level of such activity.

Cross-sectoral investments

This section now turns to another important issue concerns the interaction of the frameworks for capital regulation within the three sectors. This is the question of the implications for capital regulation of the ownership of a firm in one sector by a firm in another sector. This includes the possibilities both of complete ownership as well as the potentially more complex issue relating to partial ownership/investment. The analysis below builds on three components: (1) the work in understanding differences in the approaches to capital regulation within each sector, (2) prior work of the Joint Forum, in particular its “Capital Adequacy Principles” paper, and (3) information provided by working group members on current approaches to cross-sectoral investments employed in various countries. A summary of these current approaches is provided in Annex 5.

The goal of this section is not to recommend a single approach for addressing the capital implications of cross-ownership and cross-investment. In this regard, the principles outlined in the “Capital Adequacy Principles” paper provide the appropriate starting point for supervisors to consider in this area. Rather, the aim of the present section is to consider the potential implications of underlying differences in capital frameworks, as discussed above, for the treatment of cross-sectoral holdings. As already noted, the underlying frameworks for capital regulation in the three sectors are in many cases quite different. Therefore, as the scope of conglomeration and other forms of cross-sectoral investment increase, it is critical to consider the implications of different approaches to applying such frameworks to particular situations.

As background for this discussion, it is important to emphasise that firms seek to become conglomerates or otherwise engage in cross-sectoral investments primarily to realise their underlying business strategies. For example, firms may seek to engage in both banking and

insurance activities because of a view that there will be opportunities for synergies between the two businesses. Capital regulations likely play a very modest role in influencing strategic business decisions along these lines. However, once firms have made the decision to become a conglomerate or to undertake cross-sectoral investments, it is useful to consider what incentives capital regulations could create for how firms might choose to structure the resulting combination of activities.

To proceed with this analysis, it is helpful to have in mind a concrete, stylised example from which certain principles and insights may be drawn. The example here is deliberately simplified to better focus on the core issues. The implications of particular complicating factors are discussed following the main analysis.

Consider as an example a case where there are two firms, A and B, operating in two different sectors. Firm A is the sole owner of firm B, so that it holds all of B's equity capital. Further assume the following simplified (unconsolidated) balance sheets for firms A and B.

Firm A Balance Sheet (unconsolidated)

Assets	Liabilities
Investment in firm B (book value) = 20	Equity Capital = 50
Other Assets = 180	Other Liabilities (not capital) = 150

Firm B Balance Sheet

Assets	Liabilities
Assets = 100	Equity Capital = 20
	Other Liabilities (not capital) = 80

Finally, assume that the capital requirement on firm A holding aside its investment in firm B under the rules of its sector would be equal to 18 (10% of its other assets). This requirement will be referred to as the solo requirement on firm A's activities.

The analysis of this simple example will proceed by looking at the potential capital requirements for firms A and B under several different approaches. In each case, one should consider how the potential capital requirements for firm B's activities affect the analysis. The basic approaches will be referred to as (1) Full consolidation, (2) Joint Forum methods, as set out in the "Capital Adequacy Principles" paper, (3) Total deduction, and (4) Risk-weighting. While these are not fully exhaustive of all possible approaches, they do cover the majority of current methodologies.

Full consolidation

Under the full consolidation approach, firm A would apply the capital framework of its own sector to its fully consolidated balance sheet after netting out all transactions between A and B. This would produce the following fully consolidated balance sheet for firm A.

Firm A Balance Sheet (consolidated)

Assets	Liabilities
Assets = 280	Equity Capital = 50
	Other Liabilities (not capital) = 230

The capital requirement for firm A under this approach will be based on the capital requirement for firm A's own activities plus the requirement for firm B's activities under the sectoral requirements applicable to firm A. By assumption, the requirement for firm A's own activities are equal to 18. We now assume that the marginal requirement for firm B's activities under the rules of A's sector is 10. This implies that the total requirement for firm A under this approach is equal to 28 and its available capital to meet the requirement is 50.¹⁶ These figures will form the basis for comparisons with those produced under the other approaches discussed below.

It is important to note that the marginal requirement might or might not necessarily equal the stand-alone charge that would be levied on firm B if it were directly subject to the capital requirements of firm A's sector. This is because the capital framework for firm A's sector could include diversification benefits or other features that would reduce the total charge for a consolidated firm A below that which would result from simply summing the capital requirements for firm A and firm B as if each were separately subject to the requirements of firm A's sector.

Some banking regulators, particularly in dealing with securities subsidiaries apply the full consolidation approach. It is less frequently applied in conjunction with banking and insurance combinations. From the banking side, this reflects the fact that bank capital rules do not address technical risks associated with insurance activities. This raises a general point in regard to the full consolidation approach. Namely, a fully consolidated capital requirement can only deliver an appropriate treatment of the risks associated with a subsidiary's activities if the capital regulations of the parent firm address those risks directly.

It is interesting to note the implications of applying a full consolidation approach when the capital framework of the parent does not directly address the salient risks of the subsidiary. In this case, both the subsidiary and the parent might just be able to meet regulatory requirements on a solo basis, but the fully consolidated requirement would indicate an excess of available capital. For example, consider some modest changes to the example shown above. Assume that instead of 50, firm A's capital equals 38 and that the sectoral requirement for firm B equals 20. In this case, both firm A and firm B would just meet their stand-alone (solo) capital requirement. However, because the requirement for firm B's activities under the rules of firm A's sector is only half of that applied to B on a solo basis (10 vs. 20), the fully consolidated requirement for A suggests that available capital exceeds regulatory capital by a margin of 10 (38 vs. 28). Conversely, if firm B's sectoral capital requirement produced lower capital charges for its exposures than under A's sectoral rules, the outcome would be the opposite.

The key point here is that while a fully consolidated approach will naturally deal appropriately with issues such as multiple gearing and consolidation differences, it also needs to fully address all relevant risks to provide an effective picture of group-wide capital adequacy. In practice, this may be difficult to achieve because of the large number of different risks that would need to be addressed to cover the full range of risks currently addressed in the different sectoral frameworks discussed above. In particular, to cover all possible combinations of subsidiary investments, this implies the need for a framework that would include credit, market, technical, and perhaps operational risks. At present, no single sectoral framework fully incorporates all such risks.

¹⁶ We also assume that firm B must meet its sectoral capital requirement on a solo basis. Later, we discuss the implications associated with solo capital requirements in the context of cross-sectoral investments.

Joint Forum approaches

In its “Capital Adequacy Principles” paper, the Joint Forum set out three approaches to meeting the objective of a group-wide measure of capital adequacy that addresses the key risks within each legal entity and corrects for double leverage and other practices that can distort assessments of capital. These approaches differ in various details, such as whether the calculations are based on consolidated or unconsolidated data, but at root have the same basic concept. This concept is that a group-wide assessment of capital adequacy can be achieved by comparing the aggregate of the sectoral requirements (or their proxy) for all legal entities with the sum of group-wide capital, adjusted to eliminate any double counting.

Thus, returning to the original terms of the numerical example, the total capital available is 50. The solo capital requirement for firm A under the rules of its sector is assumed to be 18. Thus, under the Joint Forum method, the total capital requirement is equal to 18 plus the sectoral capital requirement for firm B under the rules applicable to firm B’s sector. Recall that under the full consolidation approach, available capital equals 50 and required capital equals 28. Thus, if the sectoral requirement for firm B’s activities is less than 10, the group-wide capital will look better under the Joint Forum approach. Conversely, if the sectoral requirement for firm B’s activities is greater than 10, then group-wide capital will look better on a fully consolidated approach than under the Joint Forum method.

Not surprisingly, therefore, a key issue in comparing the Joint Forum method with a fully consolidated approach is whether the capital requirement for the activities of a subsidiary is more or less stringent under the framework of the subsidiary’s sector or under the framework of the parent’s sector. To the extent that the framework of the parent firm does not directly treat the risks of the subsidiary’s activities, then the framework of the subsidiary’s sector is likely to be more stringent and the Joint Forum approach will show a more conservative view of group-wide capital adequacy.

On the other hand, it is possible that the capital framework of the subsidiary’s sector may not treat directly all of the activities of the subsidiary. In particular, if the subsidiary engages in activities that are more typical of the parent’s sector and less typical of the subsidiary’s sector, then it is possible that the parent’s capital framework would treat these activities more stringently than the subsidiary’s own framework. In this case, the Joint Forum methods would lead to assessments of capital adequacy that is less stringent than those that would arise from a full consolidation approach.

Use of the Joint Forum approaches does not by itself remove inherent differences in the capital frameworks of the different sectors. In some cases, these differences may create incentives to place certain activities in one type of firm rather than another. Because the Joint Forum approaches are built on the foundation of the individual sectoral approaches, these incentives may remain even when the Joint Forum methods are applied. Accordingly, supervisors may still need to be alert to the possibility that conglomerates could shift activities among legal entities within the organisation in order to reduce the resulting overall capital requirement.

Importantly, however, use of the Joint Forum methods creates no implications for the structural organisation of conglomerates. The assessment of group-wide capital adequacy under such an approach is essentially indifferent to which type of firm is the parent and which is the subsidiary. In the numerical example, it would not matter for the Joint Forum approach whether firm B is the subsidiary of firm A or vice-versa. The resulting group-wide capital assessment is the same regardless. Naturally, this is not true for the fully consolidated approach where – if it were widely used – there could be an incentive to have the parent firm be the one whose sectoral capital rules are the most lenient or the least complete in terms of risk coverage.

Another issue that this report highlights with respect to the use of the Joint Forum methods concerns the potential for varying relationships between actual and required capital in the different sectors. The fact that these relationships may vary suggests the need for some care in interpreting group-wide assessments of capital adequacy computed using the Joint Forum approach. For example, a conglomerate may contain substantial amounts of banking, securities, and insurance activities. A group-wide capital assessment for such an entity will compare required capital to available capital. Yet, the resulting ratio may not be strictly comparable to ratios for purely banking, or purely insurance, or purely securities companies. In other words, it will behave like a hybrid of individual sector ratios and therefore supervisors and market analysts will need to incorporate this into their use of conglomerate ratios.

Total deduction

The total deduction approach is also discussed in the Joint Forum's "Capital Adequacy Principles" paper. This method may be used whenever a supervisor believes that it may be difficult for excess capital in a subsidiary to be used to support group-wide risks. Essentially, the approach consists of the de-consolidation and removal of a subsidiary's assets and liabilities from the accounts of the parent. Moreover, the book value of the investment by the parent in the subsidiary is deducted from the parent's available capital. The subsidiary's capital would also continue to be evaluated on a solo basis, as is the case with both the full consolidation and the Joint Forum approaches.

In the context of the numerical example, the total deduction approach would require deducting the investment of 20 in firm B from firm A's available capital, so the total available capital for firm A would equal 30 under this approach. Required capital would be based solely on firm A's activities, excluding their investment in firm B. Thus the capital requirement for firm A, by assumption, would be equal to 18. It is not possible to do an exact comparison with the other approaches discussed thus far, since the available capital under these approaches is 50. However, it is possible to compare the ratio of available capital to required capital under the different approaches.

Using the total deduction method, the ratio of available capital to required capital for this example is 1.67 (30/18). Note that this is essentially a solo capital calculation for firm A, excluding the investment in firm B. For the full consolidation approach, the ratio of available to required capital is 1.79 (50/28). The ratio is higher under the full consolidation approach because the ratio of actual capital invested in firm B relative to its marginal requirement under the rules of firm A's sector is greater than the similar ratio derived from the solo requirement for firm A. As long as the ratio of the capital invested in a subsidiary to the requirement for the subsidiary under the rules of the parent's sector is greater than the similar ratio computed for the parent on a solo basis, then it will be advantageous for the firm to use a full consolidation approach.

Turning now to a comparison with the Joint Forum method, the available capital for the Joint Forum approach is 50 and the capital requirement is 18 plus the sectoral requirement on firm B. To achieve a ratio of available to required capital of 1.67 – the ratio under the total deduction approach -- therefore implies that the sectoral requirement on B would be equal to 12 ($[50/1.67]-18$). If the sectoral requirement on firm B is greater than 12, then the Joint Forum approach is more conservative than the total deduction approach. If it is less than 12, then the total deduction approach is more conservative. In this example, note that the value 12 is precisely the sectoral requirement for firm B that implies a ratio of available to required capital for firm B on a solo basis equal to 1.67 (20/12). In other words, the critical comparison ratio for the Joint Forum approach is the ratio of the capital investment in the subsidiary to the capital requirement on the subsidiary's activities under the rules of the subsidiary's sector.

It should be noted that there are variants to the total deduction approach that do not require deductions from equity capital, but allow deductions to be made from different elements of eligible capital. While more complex to analyse, such approaches are obviously conceptually quite similar to the basic total deduction approach. The key issue in most cases relates to whether the rules for deduction are more or less stringent than the actual form of the capital investment made by the parent in the subsidiary. Clearly, if the rules allow deductions that are less stringent than the economic substance of the investments, then such approaches may be somewhat less conservative than the total deduction approach would be otherwise.

Risk-weighting

The risk-weighting approach is the fourth and final approach discussed here for the capital treatment of subsidiary investments. Essentially, the risk weighting approach treats the parent's investment in the subsidiary just as any other equity investment would be treated under the parent firm's capital framework. Thus, if there were a 10% capital requirement on equity investments under those rules, the parent firm's capital requirement on the investment in the subsidiary would also be equal to 10%. The range of capital requirements on equity investments obviously could range from zero to 100% (dollar-for-dollar capital requirement).

In the numerical example, the capital requirement for firm A under the risk-weighting approach would equal 18 plus the capital requirement on the investment of 20 in firm B. Since the total capital available to firm A is 50, as long as the capital requirement on the investment in firm B was less than 12 (that is equivalent to 60% of the investment of 20), the ratio of available capital to required capital for firm A would be lower under the risk-weighting approach than under the total deduction approach. More generally, the key ratio to consider in evaluating the risk weighting approach versus the other approaches discussed above is the reciprocal of the per currency unit requirement on the investment. For example, if the capital requirement is 20%, the reciprocal is 5; if the requirement is 60%, the reciprocal is 1.67.¹⁷

For the risk weighting approach to be as stringent as the other approaches, this analysis implies that the reciprocal of the capital requirement likely will need to be in the same range as typical ratios of available to required capital for the different sectors. Since the amount of available capital is rarely more than a few times as large as required capital, this further implies that capital requirements on equity investments probably would need to exceed 25% or even more in order to be as stringent as the other approaches. This contrasts, for example, with the current Basel Accord for banks, where equity investments receive an 8% capital requirement.

Based on the preceding analysis, the criteria for evaluating when one approach will be more conservative than another can be summarised in the following table.

¹⁷ An interesting consequence of this approach to evaluation is that a 100% capital requirement on the investment in firm B appears to be a more stringent approach than the total deduction approach. Intuitively, both approaches seem equivalent since one requires removal of the full value of the investment from the calculation of available capital, while the other requires a 100% requirement on the value of the investment. Mathematically, however, the ratio of available to required capital is affected by whether the investment is treated in the numerator or the denominator of the ratio. In general, the resulting ratios of available to required capital will be higher if a deduction is made from the numerator as opposed to an increase in the denominator.

Approach	Key ratio to calculate
Full consolidation	Capital investment in subsidiary to required capital for subsidiary's activities under rules of the parent's sector
Joint Forum methods	Capital investment in subsidiary to required capital for subsidiary's activities under rules of the subsidiary's sector
Total deduction	Available capital to required capital for parent on a solo basis
Risk weighting	Reciprocal of the per dollar capital requirement on the investment

In comparing any two of the approaches listed in the table, it suffices to compare the listed ratios for those two approaches. The approach with the lower ratio will produce the more conservative capital adequacy calculation in a given situation (i.e., a lower ratio of available capital to required capital).¹⁸

Seen in this fashion, it is clear why comparisons involving the total deduction method depend critically on norms for the ratio of available capital to required capital across the sectors. For a sector where the solo ratio is typically higher than for the other sectors, the total deduction method likely would produce the highest parent ratio of available to required capital when there are cross-sectoral subsidiary holdings. Conversely, for a sector where the solo ratio of available to required capital is typically lower than for other sectors, then use of the Joint Forum or full consolidation methods likely would produce the highest parent ratio.

This analysis further implies that it is not possible to provide a general ranking of the degree of conservatism associated with the different approaches. Rather, the actual degree of conservatism depends on the facts and circumstances of the particular firms involved. In some cases, total deduction could produce the most conservative capital ratios for the parent firm, in the sense of having the smallest multiple of available capital to required capital. In other cases, however, either the full consolidation approach or the Joint Forum approaches could be the most conservative in this sense.

Other issues

As noted at the outset of this section, there are some other issues that should be considered in analysing the capital treatment of cross-sectoral investments. First, it is useful to consider the interaction of the approaches described above with solo capital requirements at the parent and the subsidiary level. The preceding discussion assumed that both the subsidiary and the parent are regulated firms, so that both are subject to capital requirements. Thus, a solo capital requirement would apply to the subsidiary firm under each of the four approaches. Moreover, this would be the same requirement under all four approaches, so that the only difference between the approaches is in their treatment of the parent firm.

¹⁸ Alternatively, one could seek to focus on the size of the difference between available capital and required capital, rather than the ratio between the two. In this case, for example, the total deduction approach is unequivocally more conservative than the Joint Forum approach. A ratio-based comparison seems superior, however, because it is invariant to the scale of the amounts involved and seems more closely tied to how supervisors and analysts would assess the capital adequacy of a firm.

With the exception of the Joint Forum approach, the other approaches would typically be the only capital requirement applied to the parent firm. The Joint Forum method could be applied in this fashion, but could also be applied as a supplement to a solo requirement on the parent firm. To the extent that these four approaches are intended to serve as the primary capital requirement on a parent firm that owns a subsidiary firm in another sector, it is important to consider whether each of the approaches meets the objectives of a group-wide capital assessment as described in the Joint Forum's "Capital Adequacy Principles" paper. In particular, do the approaches sufficiently protect against the possibility of double or multiple leverage?

Certainly, the Joint Forum methods ensure that the capital that is being used to meet the solo requirement at the subsidiary level is not deemed to be available to cover risks at the parent. The total deduction approach in principal goes somewhat further by ensuring that excess capital at the subsidiary level is not viewed as available to the parent¹⁹. Under the full consolidation approach, although no such assurance exists, this approach does ensure that all risks are evaluated relative to capital under a single standard. If that standard were sufficiently complete in terms of risk coverage, then the basic objectives of group-wide capital assessment likely would be met.

With the risk weighting approach, however, it is possible that capital that is being used to meet the solo capital requirement of the subsidiary is also being used to support the risks of the parent firm's activities. This will be the case if the capital requirement applied at the parent level to its equity investment in the subsidiary is less than the subsidiary's own solo capital requirement. In other words, even though this capital is required to be present in the subsidiary to absorb potential losses, some portion effectively is also being used to improve the stated capital position of the parent's other activities. Thus, there may be cases when the risk weighting approach does not meet the objectives of group-wide capital assessment as set out by the Joint Forum.

A second issue that can often complicate the analysis of cross-sectoral investments is the fact that many of these investments may not involve full ownership but may only reflect partial ownership. The nature of such investments may range from quite small, non-controlling stakes, to majority controlling positions that nevertheless fall short of 100% ownership. A key issue in dealing with partial investments is the importance of the accounting rules and conventions that govern whether the subsidiaries should be deemed to be controlled and/or whether they need to be consolidated for accounting and reporting purposes.

The Joint Forum's "Capital Adequacy Principles" distinguishes three categories of partial ownership, where national accounting rules typically provide the detailed rules for separating the different categories. The first category are holdings where the parent typically has a small stake in the subsidiary (i.e., less than 20%) and does not exercise control. In general, such ownership interests in financial firms are typically treated as are similar ownership stakes in other, unregulated firms. For example, for banks in most countries this would imply a risk weighting approach equivalent to that used for other forms of equity investments.

Where the size and nature of the ownership stake provide a measure of control, partial ownership introduces the issue of majority or minority interests. These terms refer to equity

¹⁹ However, the deduction method generally deducts the book value of the parent's investment that in most cases is at historical cost. The risks and the capital requirement of the subsidiary could be much higher than book value. Therefore deduction of the highest between the investment and the capital requirement of the subsidiary might better to the Joint Forum's objectives.

interests in subsidiaries held by third parties. The key questions are (1) whether and to what extent these interests may be available to support activities other than those of the subsidiary, and (2) to what extent these interests should be included as available capital for the parent firm.

In general, minority and majority interests are not included in the capital base of the parent if a total deduction or risk weighting approach is applied. Under these approaches, there is no attempt to include the risks associated with the subsidiary's activities in the capital calculation; the focus instead is on the risk that the parent's investment in the subsidiary will be impaired. It would therefore not be appropriate to include third party capital contributions to subsidiaries in the parent's capital base in conjunction with these approaches.

The second category of ownership stake discussed in the "Capital Adequacy Principles" paper is one where the parent has a majority stake and/or exercises control. For these kinds of ownership interests, if the full consolidation or Joint Forum methods are used, it may be appropriate to include minority interests in the parent firm's capital base. This would reflect the fact that in these cases the capital calculation is attempting to assess the overall risks of the parent and its subsidiary relative to the total capital available to support those risks. Thus, there is a clear reason to include minority interests that support meeting the capital requirement on the subsidiary's activities. More difficult is the question of whether full inclusion of minority interests implies that they are also freely available to absorb potential losses at the parent. The "Capital Adequacy Principles" paper recommends the use of several tests on the distribution of capital between the parent and the subsidiary, including an assessment of restrictions on transferability, to determine whether all minority interests should be included.

The third category of partial ownership interests falls between a majority controlling stake and a small non-controlling interest. In this category (i.e., between 20% and 50%), stakes may often be deemed to provide shared control over a subsidiary. In these instances, the Joint Forum paper recommends that only the pro rata share of any excess capital at the subsidiary relative to its capital requirement be included in a group-wide capital assessment. Moreover, this inclusion should also be subject to the same tests as described in the previous paragraph regarding transferability.

Such an approach is essentially a pro rata variation on the Joint Forum approach for wholly owned subsidiaries. There is also a pro rata variation on the full consolidation approach, known as pro rata consolidation. Under a pro rata consolidation approach, the marginal capital requirement on the subsidiary included in the parent's capital requirement is pro rated based on the ownership interest in the subsidiary. Under this approach, no minority interests are included in the parent's capital base.

Comparisons between the different approaches to the capital treatment of partially owned cross-sectoral investments are similar to those for the full ownership cases. Consider first the case of the total deduction and risk weighting approaches. For an investment of a given size, there is no difference in the capital treatment depending on whether the investment is a 100% stake in a small company or a partial stake in a larger company. For example, a 25% stake in a company with total capital of 400 and an 80% stake in a company with a total capital of 125 both imply the need to deduct 100 from the parent's capital under the total deduction approach and to base the capital requirement under the risk-weighting approach on the investment of 100.

However, for the full consolidation and Joint Forum approaches, there may be a difference in the capital effect of a given investment, depending on whether it is a small stake in a large company or a larger stake in a smaller company. This is because these approaches include both the risks and the capital available to the subsidiary, even if it is only partially owned.

Thus if the ratio of available capital to required capital in the subsidiary is higher than that of the parent on a solo basis, this difference will grow as the size of the subsidiary that is included within the calculation grows, even if the absolute size of the parent's stake remains constant. Clearly, however, there is a limit to this process, and it occurs when the pro rata methods are used. Both pro rata approaches essentially limit the extent to which the size of the subsidiary affects the resulting parent capital ratios, independent of the absolute size of the parent's stake.

Thus, while it may be more complex to analyse differences in capital approaches for partially owned stakes than for wholly owned stakes, the basic principles are the same. The major new wrinkle is that differences between the Joint Forum methods and the full consolidation approach, on the one hand, and the total deduction and risk weighting approaches, on the other, may be enhanced in the presence of larger subsidiaries, holding the absolute size of the ownership interest constant. This arises because in the former approaches all of the subsidiary's activities enter into the capital requirement calculation as well as all of its capital, including minority interests. This further implies that differences between the pro rata variations on the Joint Forum and full consolidation approaches and the total deduction and risk weighting approaches will be smaller because the pro rata variations do not take into account the full scale of the subsidiary's activities or capital.

A third and final issue to consider in analysing the capital treatment of cross-sectoral investments is the potential for differences in the rules covering eligibility of capital in the different sectors. As noted earlier in this section, the details of these rules differ somewhat across the different sectors. In practice, it is difficult to generalise about the precise implications of these differences although some observations can be made. Clearly, if the capital framework of the parent's sector has less stringent rules for recognising eligible capital than the capital framework of the subsidiary's sector, then the full consolidation approach could be advantaged relative to the Joint Forum approaches. That is, the full consolidation approach would produce a less stringent requirement than if the Joint Forum approach calculated excess capital according to the rules of the subsidiary's sector. Likewise, the full consolidation approach could be more stringent if the eligibility rules are stricter at the parent than at the subsidiary.

Obviously, the rules governing capital eligibility at the subsidiary are irrelevant to the calculation of the total deduction and risk weighting approaches. Thus, comparisons between these approaches and the full consolidation approach are similarly unaffected. However, comparisons of relative stringency between these approaches and the Joint Forum methods could be affected by the strictness of the capital eligibility rules at the subsidiary. The stricter are those rules, the more likely it is that the Joint Forum approaches will yield more stringent results overall.

In practice, different rules for the eligibility of capital could in some cases lead to different results for the individual variants of the Joint Forum methods.

To summarise the discussion on cross-sectoral investments, it is not a simple issue to assess the different capital treatments for these investments. No single approach is always more or less conservative. The relative stringency of the various approaches depends on the coverage and degree of conservatism of the individual sectoral frameworks in the context of the specific cross-sectoral investments. This section helps provide a framework for comparing the different approaches and how these comparisons are affected by issues such as partial ownership and different rules for the eligibility of capital.

IV. Conclusions and Future Developments

Conclusions

This section of the report summarises the key conclusions and recommendations that have emerged from analysis of the approaches to risk management and capital regulation in the banking, securities, and insurance sectors.

In the area of risk management, the Joint Forum is encouraged by the emphasis that firms in all three sectors are placing on risk management and risk measurement issues. This should result in stronger and better managed firms. Measurement approaches that provide firms with the ability to quantify risks provide important tools for assessing risk/return tradeoffs and encouraging sound risk management practices. However, firms need to understand the limitations of such methodologies and where necessary should supplement such approaches through stress testing.

As firms become active participants in new markets and take on new types of risks, it is important that they develop the capability to assess these risks and remain aware of relevant innovations in risk management practice. Importantly, their risk measurement and management practices for these risks should be appropriate for their level of activity. In particular, firms should focus on the need to hold capital to support these activities and should be able to support their judgements of the necessary capital on the basis of assessments of the relevant risks that are carried out independently from the operational business units. Clearly, senior levels of the firm should approve significant expansions of firm activity into new risk areas.

Fully consolidated risk measurement and risk management is the ultimate objective for many firms with activities that span multiple risk categories and business lines. The Joint Forum supports continued efforts by firms to further develop such methodologies in spite of the difficulties associated with both the potential need to reconcile differing time horizons for risk assessment and the measurement of diversification benefits. However, the potential for excessive optimism should be noted when making simplifying assumptions in the calculation of risk measures that span multiple categories of risk. In the absence of precise data, it may be tempting for firms to assume significant amounts of diversification benefits rather than take a conservative approach. Firms should therefore evaluate such simplifying assumptions carefully, particularly their potential validity during stressful scenarios.

The emphasis on risk management within firms should ideally be complemented by a focus on the quality of a firm's risk management by market analysts, rating agencies, and the firm's counterparties. Market discipline is a key tool for helping to ensure that firms devote appropriate resources to risk management issues and that emerging risk concerns are promptly identified. Accordingly, the Joint Forum supports initiatives to develop meaningful, comparable disclosures that allow market analysts and others an improved ability to evaluate the quality of a firm's risk management. In particular, the findings included in the report of the Multidisciplinary Working Group on Enhanced Disclosure, sponsored in part by the parent committees of the Joint Forum, should be endorsed.

Supervisory emphasis on the importance of risk management is also clearly beneficial. The efforts that individual supervisors and groupings of supervisors have made to highlight appropriate practices, policies, and procedures in regard to various risks is desirable and helps to increase the rate at which effective risk management approaches are adopted industry-wide. Looking forward, supervisors should place particular emphasis on two issues: (1) understanding the differences in types of risks and how firms may be assessing those risks that are traditionally non-existing or less common in their sector than in other sectors, and (2) understanding the methodologies that firms are developing to provide a consolidated

firm-wide view of risk that spans multiple risk categories. In this regard, cross-sectoral supervisory cooperation and information sharing is critical to ensuring that supervisors in the different sectors have a sound understanding of how risk management practices may differ and where improvements may be needed.

In regard to capital, there is a need for supervisors to evaluate sectoral capital regulations in light of the degree of convergence that is occurring between the sectors. Clearly, some convergence is occurring in the form of cross-sectoral risk transfer, cross-sectoral investments, and full-fledged conglomerates. However, it is not clear how fast such convergence is proceeding and there remain very significant differences in the business activities of firms in the different sectors.

The existing differences across the sectors support the desirability of sectoral capital regulations that have the flexibility to respond to the specific needs of each sector. Moreover, in the current environment, the existence of multiple frameworks allows greater opportunity for innovations in the approaches to capital regulation to be considered and tested.

This does not imply that supervisors can ignore convergence. As supervisors evaluate the extent of cross-sectoral activity, it may become important for the individual sectoral frameworks to be updated to better reflect the contemporary risk profiles of the firms subject to those frameworks. It would not be surprising, for example, for some jurisdictions in the near future to consider greater convergence in the frameworks applied to the different sectors.

When considering this issue, supervisors should consider the potential for existing capital regulations to provide incentives for capital arbitrage. To the extent that some firms are engaging in activities that are not addressed through capital requirements, supervisors need to ensure that other measures are in place to ensure that the associated risks are being appropriately managed and are supported by sufficient economic capital. In addition, supervisors should consider the implications of sectoral regulations on the incentives that firms have to place or move transactions across legal entities within the firm.

Finally, supervisors should continue to evaluate the approaches that can be taken to address cross-sectoral investments within the various capital frameworks. These approaches can have implications for the choices that firms make about how to structure their operations and how conglomerate capital market participants evaluate. Accordingly, supervisors from the different sectors should continue to cooperate and share views with respect to these approaches in an effort to ensure there is a common understanding of these implications.

Developments on the horizon

There are several emerging trends and developments that are likely to impact on the issues that have been the focus of this report. Going forward, the progression of these developments likely will have a significant influence on how long the preceding conclusions remain valid or whether sufficient changes will occur to require another look at the relative approaches to capital regulation.

The first set of potential developments relates to the ongoing changes in business strategies undertaken by firms in the different sectors. For example, for a variety of reasons, the financial services industry has been undergoing a significant amount of consolidation. As firms continue to seek to harness the advantages of greater scale, it is natural to consider whether this will contribute to greater levels of cross-sectoral risk-taking and/or cross-sectoral investments. The answer to this may depend on the degree to which synergies exist between the various core business activities of banking, securities, and insurance. Clearly, some of

the conglomerate mergers that have taken place in recent years reflect a belief that such synergies do exist and can be successfully exploited by firms that are committed to the cross-selling of the various types of financial products. However, the view that this is likely to be the most successful long-term strategy for financial services firms is not universal and therefore the next five years or so is likely to be critical in providing evidence that will influence the strategies taken by individual firms.

More broadly, the ongoing advances in information technology as well as financial technology suggest that caution is warranted in assuming that the core business activities of the three sectors will continue to remain as distinct as they have been traditionally. At this stage, the long range implications of the use of the Internet to interact with customers electronically remains unclear, but certainly some observers believe that such developments could lead to a blurring of the distinctions between the sectors. At the product level, some believe that the securities and banking sectors will continue to converge as corporate customers seek to obtain unsecured credit lines simultaneously with other forms of business finance and retail customers demand an integrated approach to banking and brokerage services. Similarly, recent changes in the annuities business suggest that the border between insurance products and those of the other sectors is also undergoing transformation.

As noted previously, another key factor that is likely to affect business strategies in the three sectors is the ongoing development of risk management methodologies. Because capital is a scarce resource and because the markets are imposing a significant discipline on all firms to generate strong risk-adjusted returns, firms in all three sectors are sure to continue looking at approaches to manage their risks more efficiently. Because of the significant potential for risk diversification in acquiring risks that are not highly correlated with existing risks, firms will increasingly be on the lookout for ways to acquire such risks as long as they also offer competitive returns. As noted above, it is currently quite difficult to evaluate the extent of diversification that cross-sectoral activities offer, but certainly the significant efforts that firms are undertaking in this area will influence the extent of such cross-sectoral activities in the years to come.

Related to this point is the likely development of more liquid and more transparent markets for the transfer of all forms of risk. In the last twenty years, the growth of the derivatives markets has transformed the available approaches for managing foreign exchange and interest rate risk, to name but two examples. Similar rapid growth is now underway in markets for the exchange of credit risk and insurance risk. Clearly, as it becomes possible to trade risks more easily and prices become more transparent, the task of risk measurement and risk management also becomes easier. These trends may also help to draw more non-traditional participants into the markets for these risks.

A second important set of developments that will influence the issues considered in this report relates to the potential for changes in the broader regulatory and supervisory environment. In most but not all countries, significant statutory barriers to the existence of banking, securities, and insurance firms within a single conglomerate have been largely eliminated. In line with these developments and the supervisory principles advocated by the Joint Forum, the extent of cooperation and information sharing between supervisors in the different sectors has been increasing. This has occurred both in jurisdictions where sectoral supervisory bodies remain distinct and in jurisdictions where these have been combined within a single entity. Looking forward, it is likely that the degree of cooperation and communication between sectoral supervisors will continue to increase, offering greater opportunities for shared insights and common perspectives to emerge.

Another important development that could affect the supervisory framework, as well as firms themselves, is the potential for changes in accounting requirements. As discussed at several

points in the report, the choice of mark-to-market or “fair value” accounting versus historical cost accounting requirements has significant implications. The choice of accounting regimes reflects views about the timeframe appropriate for evaluating risk and the potential for loss and is itself reflected in the capital frameworks of the various sectors. Similarly, the accounting rules governing provisions have a significant influence on the role of capital and the approach of the sectoral capital frameworks. For these reasons, changes in accounting standards or conventions could have a substantial impact on the perspectives toward capital regulation taken within each sector. This suggests that some of the initiatives now underway in connection with the various accounting standards-setting bodies may be particularly important in this context.

Over the next five years, there are also certain to be some significant developments with respect to the capital regulations imposed within individual sectors. Perhaps the most significant change currently on the horizon is the revision to the Basel Accord. Several aspects of this revision are worth highlighting. First is the substantial emphasis on supervisory review and market discipline under the revised Accord. Second is the significantly enhanced risk sensitivity of the minimum requirements. Both of these elements reflect an effort to bring the regulatory capital framework more in harmony with the economic capital frameworks that firms have been developing.

Importantly, the revised Basel Accord will allow banks to use their internal measures of borrower creditworthiness as a key input into the capital requirement for credit risk. This continues a trend toward internally generated measures of risk that was at the heart of the so-called “internal models” approach to market risk capital. There are also moves in this direction in the other sectors as well, although not on the same scale. For example, the US capital rules for registered OTC derivative dealers and the new proposals in Australia for insurance capital both contain elements that build on firms’ internally generated measures of risk.

The tendency to base capital regulations on firms’ own measures of risk has both benefits and costs for supervisors. On the one hand, in the long run, it holds out the promise of more risk-sensitive regulations that require less detailed prescriptive calculations. That is, the supervisor should be able to set the objective of the requirement without necessarily prescribing exactly how firms need to meet that objective. On the other hand, capital regulations based on firms’ own measures of risk raise issues of comparability across firms and almost certainly increase the burden on supervisors to better understand how firms are measuring risk and assess whether a given firm’s approach meets the appropriate standards. Moreover, the transition from requirements based on supervisory rules to those based on internal risk estimates may be costly, with the rules governing such a transitional period more complex than would be the case either before or after such a transition.

Clearly, the years following the implementation of the revised Basel Accord will provide additional evidence on the costs and benefits of capital regulations that are more closely tied to firms’ own estimates of risk and thus to their measures of economic capital as well. This evidence likely will have significant implications for the further development of the Basel Accord and for the future of similar approaches to capital regulation in other sectors. More broadly, the prospect for a common approach to capital regulation across the three sectors could be significantly affected by these developments. That is, a project to develop common prescriptive capital charges for all three sectors is quite different in concept from one aimed at setting standards and objectives for an approach built around firm’s internal risk estimates.

A final area where supervisory developments may have important influences is in regard to the approaches used within individual jurisdictions to assess consolidated capital. As the level and importance of cross-sectoral investments and activities grows, the particular approaches that have been adopted within individual sectors and jurisdictions will become

more important. The initiative of the EU countries to adopt a supplementary capital regulation that effectively produces a group-wide assessment of capital and risk at the conglomerate level is a particularly important development in this regard. The implementation of this directive and its use by supervisors and market analysts will be influential in assessing how best to cope with the need to take a group-wide perspective in the context of a world where sectoral capital requirements remain distinct.

This issue highlights the fundamental tension facing supervisors in the years ahead. Sectoral approaches to capital regulation well reflect the traditional business activities and perspectives within each sector and thus remain quite different from one another. Nevertheless, it is clear that some convergence between the sectors is currently occurring, which may or may not gather pace in the foreseeable future. To the extent that the degree of convergence increases, supervisors will increasingly need to reevaluate their sectoral regimes for capital and provisions to ensure that they provide an appropriate means of evaluating the capital held by firms in relation to their activities. In this context, the Joint Forum remains committed to providing a mechanism for enhancing the mutual understanding and cooperation among supervisors that will be necessary in addressing these challenges.

Annex 1

Glossary of key terms as they are used in the report

Banks

Credit derivatives – Credit derivatives are financial instruments that provide for the direct exchange of credit risk between counterparties without requiring the transfer of the assets that give rise to such exposure. They encompass a range of instruments that allow either full (e.g. total return swaps) or partial credit protection under specific circumstances (e.g. credit default options) for the protection buyer. The flexibility of such instruments currently allows banks to actively manage the credit risks per counterparty; per sector and per geographic area regardless of the instruments they are hedging (securities, loans or off-balance sheet items). Credit derivatives are one of the main categories of instruments allowing for risk transfers between banks and other financial institutions.

Expected losses – The term “expected losses” used in this Report as applied to banks is restricted to credit losses. Expected losses are the losses a bank anticipates because there is a likelihood that at least some of the credits that it has extended will not be repaid or will only be partially repaid as and when they come due. From a statistical perspective, they correspond to the mean of a loss distribution function and are assessed on the basis of the bank’s historical loss experience (see also Unexpected losses). Such losses, because they are expected, are provided for in the pricing of credits, with poorer credits attracting higher risk-spreads (and possibly other requirements to mitigate the credit risk such as collateral for instance) since their default probabilities and their potential for loss given default are higher. These risk spreads theoretically provide the basis for provisions for credit losses or loan loss reserves. However, largely because of accounting and tax rules, most banks can only set aside provisions/loss reserves on assets when the risk is clearly identified, only capturing part of the losses that can be expected over a loan portfolio’s time horizon.

General provisions/general loan loss reserves – These are loan-loss reserves held presently against unidentified losses (i.e. they are not assigned to any particular and individual exposure) and are freely available to meet losses which may subsequently materialise. Provisions ascribed to the deterioration of particular assets or known liabilities (whether individual or grouped) are therefore excluded. Because they are freely available, they can be included, subject to a maximum of 1.25% of total risk-weighted assets, in Tier 2 regulatory capital under the Basel Accord. One of the typical examples for such items is the possibility to include part of the general provisions for country risk in Tier 2.

Provisions for credit losses or loss reserves – Provisions or loss reserves, often specified as loan loss reserves are amounts deducted (i.e. reserved) from operating income to address expected (or anticipated) losses. As their name indicates, they are reserved against loans or, more generally, credit losses. They can be either specific, in the sense that they relate to specific credit exposures and provide a means for the bank to write down the value of particular assets, or general. General provisions or general loan-loss reserves are essentially made up of provisions for unidentified losses that relate to currently unknown conditions that could arise in the future. The typical example in banking activities refers to country risk. Although transferred to a separate reserve, they are freely available to meet unidentified losses as and when they occur and can therefore, under specific conditions, be included in part in the regulatory capital basis.

Revaluation reserves – Such revaluation reserves may be included in Tier 2 regulatory capital provided that they are prudently valued, fully reflecting the possibility of price fluctuation and forced sale and subject to a 55% supervisory discount applied to the difference between book value and market value. This discount is meant to reflect the potential volatility of unrealised capital gains and the notional tax charge that such gains carry. There are two main categories of revaluation reserves provided for in the Basel Accord:

- Revaluation of fixed assets, generally the bank's own premises, that may be permitted in some jurisdictions to reflect long-term changes in market value.
- "Hidden values" resulting from long-term equity holdings at historic cost.

Both categories of revaluation require prior supervisory approval and, although sometimes used in the past, are generally uncommon.

Securitisation – A risk transfer technique that appeared in the US at the beginning of the 80s. In a securitisation, a bank's exposure to credit risk is transferred into a Special Purpose Vehicle (SPV) that issues securities to a broad array of investors. These securities are typically rated by rating agencies although some asset securitisations are private placements involving non-rated securities. Such techniques are currently and increasingly used in many jurisdictions and encompass a wide range of credit exposures including for instance residential mortgages (mortgage-backed securities), corporate loans and credit card receivables. Although initially used to transfer credit risk, securitisation techniques are also used by large banks as an alternative way to raise funding.

Unexpected losses – The term "unexpected losses" used in this Report as applied to banks is restricted to credit losses. These losses correspond to the unpredictable/unforeseeable losses that have a low probability occurrence but may nevertheless occur. Statistically, for a given confidence interval, unexpected losses (UL) correspond to the difference between the maximum loss incurred and expected losses (EL). However, the probability distribution of credit losses implies that unexpected losses can exceed anticipated losses by a significant margin during bad periods since expected losses are basically a loss average over all periods. Capital requirements for banks are derived from and meant to cover such unexpected losses.

Insurance companies

Actuary - a person knowledgeable and experienced in quantitative sciences, such as mathematics, statistics, demography, probability theory and computational methods. Actuaries specialise in analysing the financial effects of contingent events and designing financial security systems to face them, such as insurance and pensions. Actuaries typically can be found in life insurance.

Alternative risk transfer (ART) – Non-traditional forms of risk transfer, including those that provide substantial amounts of risk transfer and do not fall into the conventional insurance market definition but include at least an element of insurance risk (as opposed to only pure financial risk). The main distinguishing features of the ART markets are:

- tailor made solutions
- multi-year policies

- often cover risks that the conventional market would regard as uninsurable
- often contains some form of risk transfer of non-insurance risk
- inter alia provide risk-funding solutions such as self-insurance.

The definition of ART includes but is not restricted to financial reinsurance and securitisation of insurance risks.

Captive insurance companies - An insurance company established by a parent firm for the purpose of insuring the parent's exposures.

Catastrophe bonds - a risk transfer function similar to that of insurance and reinsurance, whereby investors place cash into a safe account (e.g., special purpose vehicle or safe trust) from which they receive interest. The proceeds of the account are available to the cedent only if a catastrophic loss event occurs. In return for this benefit, the cedent pays a premium, which is transferred (in addition to interest), directly to investors. If there is no loss event, the safe account remains just that — safe. After interest and premium is paid to investors for a specified period of time (usually from one to three years), the full principal is returned to investors. However, should there be an event loss, the investor will receive only that portion of principal and interest that is left after paying the cedent's event losses. Catastrophe bonds are designed to protect insurance companies from events like hurricanes or earthquakes (i.e., events that happen rarely but cause enormous damage). The outstanding amount of catastrophe bonds is currently low but may rise.

On-site inspection – visit by member(s) of the supervisory authority to a company's premises to review its business, and assess its current and prospective solvency and its ability to meet policyholder obligations. An on-site inspection would generally include holding discussions with company officials and examining, as required, the company's books, records, accounts and other relevant documents.

Profit reserves (provision for bonuses and rebates) – explicit allowance in the technical provisions for future bonus and other form of profits on with profits policies.

Technical provisions - the amounts estimated to be appropriate to meet liabilities arising out of insurance contracts. The calculation must take into account not only the amount of the expected payout, but also any future premium payments and future investment income. For further detail see annex 3.

Underwriting risks – risk that the actuarial or statistical calculations used in estimating technical provisions and setting premiums are wrong. If these calculations are wrong (for example, if one or more of the assumptions on which they are based prove to be inaccurate), the consequences for the insurer can be significant. In particular, premiums charged could be inadequate to cover the risk and costs, insurers may pursue lines of business that are not profitable, and liabilities may be under- or over-stated, masking the true financial state of the company. Underwriting risks are part of the technical risks.

Unit-linked products – contracts with insurance and investment components, where the policyholder's return on the investment component is based directly on the performance of a group of assets. This is reflected by a variation in the unit price.

With profits contracts – life insurance for a fixed sum to which a bonus is added every year. The bonus is based on the insurer's experience – positive or negative – taking into account the actual mortality or morbidity experience, investment returns and expenses. The bonus rate can rise and fall but once a bonus has been added it is guaranteed. In some

countries the fixed sum insured plus bonuses are paid (plus with some companies a terminal bonus) upon death or whenever the policyholder chooses after 10 years. In others policyholders have the option of receiving the bonus in cash, putting the bonus into a specified fund that would accumulate interest or using the bonus to purchase a small face amount of paid-up life insurance.

Securities firms

Fair value – (financial assets) the amount at which the asset could be exchanged in a current transaction between willing parties, other than in a forced or liquidation sale. If a quoted market price is available for an instrument, the fair value to be disclosed for that instrument is the product of the number of trading units times that market price.

Haircut – a percentage deduction taken from the current market value of an unhedged financial asset held by a securities firm when calculating the amount of its regulatory capital pursuant to the U.S. net capital rule. For example, the haircut for an equity security traded on the New York Stock Exchange is 15%. Therefore, if a broker-dealer held \$1,000 worth of such securities, the haircut on this portfolio would be \$150. Thus, only \$850 of the \$1,000 worth of assets is counted towards the firm's regulatory (or net) capital amount. The uncounted \$150 serves as a buffer against potential market risk losses that the firm might incur should it be required to quickly liquidate the entire portfolio. The term is also used to describe the total capital deduction for all securities positions, which takes into account hedges.

Margin – (securities) the equity in a securities account where equity is defined as the total current market value of securities positions held in the account plus any credit balance and less any debit balance. Under U.S. regulations, a retail customer must initially have equity equal to 50% of the purchase price of an equity security when borrowing money to purchase it. For example, if a customer wanted to purchase \$1,000 worth of equity securities on credit, he or she would have to deposit equity into the account of \$500. The firm would then initially hold the \$1,000 worth of securities purchased on credit plus the additional \$500 equity as collateral against the \$1,000 loan.

Mark to Market – the process of adjusting the value of a security to reflect its fair value. For example, if a firm buys one share of common stock for \$50 on day 1, and on day 2 the price drops to \$45/share, the firm must re-value the security for financial reporting purposes as a \$45 asset. If on day 3, the price increases to \$55/share, the firm must again re-value it, now as a \$55 asset. This process will continue until the firm sells the security. Securities firms mark to market their proprietary securities, the securities they hold as collateral and the securities they have pledged as collateral. If the mark to market process indicates that the value of collateral held is less than the asset it is securing, they will request more collateral. Conversely, if it indicates that the value of collateral pledged is greater than the obligation it is securing, they will request a return of some of the collateral.

Securities repurchase agreement (repo) – an agreement between the seller and buyer of a security, whereby the seller agrees to repurchase the security in the future at an agreed upon price and, usually, at a stated time (generally within a short period such as in one to thirty days). Typically, repos are financing transactions in which the buyer is providing cash to the seller and holding the securities purchased as collateral. The price at which the seller will repurchase the securities in the future usually is the same price at which they were sold plus an interest component. For these reasons, the buyer generally is not concerned with purchasing a specific security, but rather with ensuring that the security purchased will

adequately secure the seller's obligation to repurchase it (i.e., return the purchase price plus interest). In the U.S., most repo transactions involve U.S. government securities.

Securities reverse repurchase agreement (reverse repo) – an agreement between the buyer and seller of a security, whereby the buyer agrees to resell the security back to the seller in the future at an agreed upon price, and, usually, at a stated time.

Securities borrowed – an agreement between the borrower and lender of securities, whereby the borrower receives a quantity of securities from the lender and agrees to return a like quantity of such securities in the future. The borrower can re-convey the borrowed securities to another party because the borrower is only obligated to return a like quantity of the securities (rather than the actual securities borrowed). The borrower pays a fee to the lender for the use of the securities, and also may have to provide collateral to secure the obligation to return them. Typically, securities firms borrow securities to meet delivery obligations arising from proprietary or customer short sales (i.e., securities sales where the seller does not currently own the securities sold). Securities borrowed positions are reflected on balance sheets as receivables when the borrower pledges cash as collateral.

Securities loaned – an agreement between the lender and borrower of securities, whereby the lender provides a quantity of securities to the borrower, which the latter can use for a period of time before having to return a like quantity of such securities. Typically, lenders loan their securities to receive a fee, which, in turn, increases the return they receive on their securities portfolios. Securities loans are reflected on balance sheets as liabilities when the lender receives cash as collateral.

Annex 2

Stylised balance sheets for Securities Firm Holding Companies, Banks and Insurance Companies

Schematic balance sheets of a securities firm, a bank, a life-insurance company and a non-life insurance company are presented below. The percentages for each class of assets and liabilities are offered to illustrate the main differences in balance sheet structures and activities only.

In some cases, the proportions reflected are specific to some jurisdictions, as indicated in the footnotes. However, the overall proportions in each example, although they may vary between jurisdictions and firms, clearly indicate the major characteristics of business activities in each sector, as mentioned in the main text of this Report.

Stylised balance sheet: US Securities Firm Holding Company

Assets		Liabilities	
Asset Class	%	Liability Class	%
Cash and cash equivalents	1.3	Securities sold under repos (8)	10.7
Cash and securities segregated (1)	5.9	Securities loaned (9)	3.2
Securities purchased under repos (2)	12.9	Short-term borrowings (10)	11.6
Securities borrowed (3)	28.4	Payables	32.2
		Customers (4)	27
		Broker dealers and clearers (5)	1.4
		Interest and other	3.8
Receivables	14.9	Financial instruments sold, but not yet purchased, at fair value (11)	25.9
Customers (4)	11.6		
Broker dealers and clearers (5)	2.1		
Interest and others	1.2		
Financial instruments owned at fair value (6)	32.9	Long-term borrowings	10.8
Other assets (7)	3.7	Total shareholder equity	5.6
		Common stock	1.6
		Paid-in capital	3.4
		Retained earnings	0.6
Total Assets	100	Total Liabilities	100

Notes to stylised balance sheet:

- (1) Represents amounts segregated pursuant to federal customer protection rules.
- (2) A reverse repurchase transaction (reverse repo) is the purchase of a security at a specific price with an agreement to sell the same or substantially the same security to the same counterparty at a fixed or determinable price at a future date.

- (3) Receivables for payment of cash to borrow securities from other broker-dealers or institutions.
- (4) Includes debits (receivables) arising from margin accounts and payables for free credit balances.
- (5) Includes receivables (payables) from pending transactions.
- (6) Includes receivables from derivative contracts representing 11.9% of total balance sheet.
- (7) Other assets may include goodwill derived from acquisitions
- (8) A repurchase transaction (repo) is the sale of a security coupled with an agreement by the seller to repurchase the same or substantially the same security from the same counterparty at a fixed or determinable price within a fixed or variable time period.
- (9) Payables for cash received to loan securities to other broker-dealers as a method of financing or in a finder or conduit business.
- (10) Includes commercial paper.
- (11) Includes payables from derivative contracts at fair value of approximately \$41 billion (12.9% of total balance sheet).

Additional notes on securities firms' activities:

(A) Off balance sheet commitments are disclosed in the notes to the financial statements. The gross notional (or contractual) amounts of derivative financial instruments represent the volume of these transactions and not the amounts potentially subject to market risk.

Gross notional (or contractual) amount of derivatives (as a percentage of total balance sheets):

Financial futures and forward settlement agreements	248%
Swap agreements	1246%
Written option contracts	229%

Other off balance sheet commitments include:

Letters of credit	3.5%
Loan commitments	3.8%

(B) The primary types of business that a securities firm undertakes are investment banking, capital markets, principal transactions (proprietary trading), asset management and commissions.

Stylised balance sheet: bank

Assets		Liabilities	
Asset Class	%	Liability Class	%
Cash and cash equivalents	0.8	Inter-bank borrowing (deposits) (1)	10.1
Inter-bank lending (1)	12.4	Customer deposits (5)	60.4
Securities (2)	8.5	Debt securities (6)	10.9
Loans and advances to customers		Other liabilities	4.6
Gross loan amounts	69.0		
Loan loss reserves	(0.8)		
Loans net of reserves (3)	68.2		
Prepayments and accrued income (4)	1.9	Accruals and deferred income (4)	2.8
Tangible and intangible fixed assets	3.4	Loss reserves (provisions) for liabilities and charges (7)	1.2
Other assets (5)	4.8	Subordinated debt (8)	4.5
		Total shareholder equity	5.5
Total Assets	100	Total Liabilities	100

Notes to stylised balance sheet

- (1) Inter-bank lending and borrowing generally occur through deposits and/or money market instruments. These are short-term securities issued or bought by the bank. In effect, when held to maturity, they are the equivalent of a traditional inter-bank time deposit.
- (2) Securities: this corresponds to securities bought and held by the bank either for trading purposes (market –making or proprietary trading) or for investment purposes (buy-and-hold). In the first case, they will be marked to market. In the second case, fixed income securities are held to maturity at cost value. Securities held by banks are in most cases essentially made up of fixed income instruments.
- (3) Loans and advances to customers are comprised of all types of credits extended to customers, including overdrafts. This item also presents loan loss reserves as a negative (contra) asset item, consistent with its presentation in a number of countries.
- (4) Prepayments and accrued/deferred income is related to all balance sheet items that are accounting for at cost and whose income is accrued. This is the case in particular for loans and advances to customers and customer deposits but can also be the case for a large proportion of inter-bank borrowing and lending.
- (5) Customer deposits are the aggregated total of all outstanding deposits and cash-balances of all customers' accounts.
- (6) Debt securities include all securities issued by the bank, regardless of maturity. In addition to bonds and medium-term notes, this might also include deposit certificates although, in some jurisdictions, such certificates are aggregates either with inter-bank borrowing or with customer deposits, depending on the nature of the investor.

- (7) Loss reserves for liabilities and charges: this can encompass, in some jurisdictions, loss reserves and/or provisions calculated on a statistical basis for specific events such as staff pensions. It also includes provisions for deferred tax. The proportion of such reserves for a bank is highly dependent on the taxation regime of its jurisdiction of incorporation.
- (8) Subordinated debt is made up of dated and undated subordinated securities qualifying for regulatory capital purposes (tier two capital) under the 1988 Basel Accord.

Additional notes on bank's activities:

Large banks from Continental Europe often tend to have a greater proportion of their respective assets and liabilities in inter-bank relationships and securities than banks incorporated in other jurisdictions. At least part of these differences in proportions can be explained by the following elements:

- Such banks generally belong to groups. A large part (if not all) of market activities conducted by such groups, including investment banking, is generally originated through the bank's specialised units. This is probably related to differences in the history of national banking systems.
- Another explanation of such differences may be the extent to which large banks use on-balance sheet netting agreements. This is rather more limited in Continental Europe because of tax and accounting issues.
- Accounting rules, categories of products and market structures differ across jurisdictions, making comparisons more difficult. For instance, a European Continental bank's balance sheet might not clearly identify repurchase-type transactions although these are included both on the asset and the liability side.

The comments below identify the main characteristics of a bank's balance sheet, while mentioning, where relevant, the main differences in structure across jurisdictions:

- Banks primarily engage in granting loans and extending credits, although market activities have become more important. Assets are mainly funded by deposits collected from customers and from other banks (inter-bank deposits). Hence, these two classes represent the bulk of respectively, assets and liabilities in the stylised balance sheet of a bank. Proportions can however be as low as 40% of assets for loans and 40% of liabilities for customer deposits, depending on the bank's reliance on market operations and inter-bank funding.
- The reliance on inter-bank funding and proportion of inter-bank lending varies widely between jurisdictions. It is, for instance, generally and significantly higher for banks in Continental Europe than for banks from the UK or North America and can represent as much as one-fifth to one-quarter of assets and liabilities. This is partly because a large part of inter-bank transactions are associated with derivatives transactions but also because, at least in some jurisdictions, equivalents to repurchase agreements may be booked as inter-bank transactions, depending on accounting rules.
- Customers range from retail customers to commercial and industrial entities to other financial institutions and governments.

- In some banks, especially in Continental Europe, a substantial part (around one-quarter) of a bank's assets can be made up of securities held for trading or investment purposes, although this is clearly not the case in the example referenced above.
- Likewise, part of a bank's liabilities can take the form of bonds or other securities. According to the bank's strategy to diversify sources of funding and the extent of its customer deposit basis, such debt securities can represent up to one-quarter of total liabilities in addition to subordinated debt.
- Off balance, traditional transactions are the undrawn credit facilities granted, and guarantees and collateral given or received.
- The bulk of off-balance sheet items, however, are made up of derivatives contracts booked at their nominal value. Their aggregated nominal amounts outstanding are often a multiple (five to eight times on average) of the balance sheet total. However, this does not in any way reflect the bank's exposure to market risks but only gives a feeling of its activity in these areas. Interest rate transactions and foreign exchange transactions account for the largest portions. These exchange traded or over-the-counter transactions can take the form of forwards, swaps or options, and can be entered into for trading or hedging purposes.
- The interest margin on the traditional banking activity still constitutes the bulk of many a bank's income, but diversification strategies have increased reliance on fees and commissions earned on all kinds of financial services provided by the banking sector (asset management, payment and settlement services, custody, proprietary trading, investment banking...).

Stylised balance sheets for insurance activities

The two stylised balance sheets below are based on aggregated figures of the German insurance sector for 1999. Proportions for insurance companies incorporated in other jurisdictions may differ and such differences are accordingly highlighted in the additional footnotes. However, the following main characteristics can be observed:

- Investments constitute an overwhelming part of the assets and technical provisions represent the largest proportion of liabilities and the main item for meeting claims.
- Life insurance companies rely more on technical provisions than non-life companies while non-life insurance companies, although primarily relying on technical provisions, tend to rely more on capital than life insurance companies to make up for higher unexpected losses.

Life insurance company

Assets		Liabilities	
Asset Class	%	Liability Class	%
Subscribed capital unpaid	0.1	Capital and Reserves	1.2
Investments	93.3	Special item with an equity portion (7)	0.2
- Real Estate (1)	2.8		
- Investments in affiliates and participating interests	3.9		
- Variable yield securities (equity) (2)	22		
- Bearer and other fixed income securities	7.1		
- Loans guaranteed by mortgages and land/rent charges	11.1		
- Listed bonds	27.9		
- Debentures and loans	15.5		
- Others	2		
- Deposits with credit institutions	0.8		
- Deposits with ceding undertakings (3)	0.2		
Deposits for life assurance policies/investment risk borne by policyholders	1.9	Technical provisions (net)	83.1
		Unearned premiums	1.3
		Mathematical provision	72.4
		Claims outstanding	0.3
		Provisions for bonuses and rebates	9.1
Debtors (4)	1.2	Technical provisions for life assurance policies/investment risk borne by policyholders (8)	1.8
Accruals (5)	1.7	Deposits retained on re-insurance ceded	4.5
Other assets (6)	1.8	Other liabilities	9.2
Total Assets	100	Total Liabilities	100

Non-life insurance company

Assets		Liabilities	
Asset Class	%	Liability Class	%
Subscribed capital unpaid	0.8	Capital and Reserves	19.9
		Subscribed capital	4.0
		Capital reserves	4.3
		Revenue reserves	10.5
		- Profit	1.1
Intangible assets	0.4	Participating certificates/subordinated liabilities	0.5
Investments	86.3	Special item with an equity portion (7)	0.7
- Real Estate (1)	4.2		
- Investments in affiliates and participating interests	11.8		
- Variable yield securities (equity) (2)	23.9		
- Bearer and other fixed income securities	11.9		
- Loans guaranteed by mortgages and land/rent charges	1.7		
- Listed bonds	17.3		
- Debentures and loans	11.5		
- Others	0.9		
- Deposits with credit institutions	1.9		
- Deposits with ceding undertakings (3)	1.2		
Debtors (4)	3.4	Technical provisions (net)	61.5
		- Unearned premiums	5.0
		- Mathematical provision	5.0
		- Claims outstanding	41.2
		- Provisions for bonuses and rebates	0.9
		- Equalisation provision and similar	8.5
		- Others	0.9
Accruals (5)	1.4	Deposits retained on re-insurance ceded	2.3
Other assets (6)	7.7	Other liabilities	15.1
Total Assets	100	Total Liabilities	100

Notes to stylised balance sheets

- (1) Real estate investments are comprised of land, land rights and buildings, including buildings on third-party land.
- (2) Variable yield securities (equity) are mainly comprised of shares and investments certificates.
- (3) Deposits with ceding undertakings: in a re-insurance context, these are amounts owed by the ceding undertakings that correspond to guarantees deposited with them or with third parties or are retained by these ceding undertakings.

- (4) Debtors mainly encompass outstanding premiums and commissions paid in advance. The two main categories of debtors are policyholders and intermediaries.
- (5) Accruals are mainly comprised of accrued interest and rent.
- (6) Other assets is comprised essentially of tangible assets and stocks, cash and checks at bank or in hand and debtors arising out of re-insurance operations.
- (7) Special item with an equity portion: This is essentially a tax-deferred accumulation of profits realised upon disposal of certain assets that is possible in certain jurisdictions (for instance in Germany).

Additional notes to insurance companies stylised balance sheets.

Insurance firms rely primarily on technical provisions to meet claims from policyholders and reliance on capital is generally considered as an additional and ultimate buffer if such technical provisions prove to be insufficient. The importance of technical provisions relative to capital is generally greater for life insurance companies, where claims are more predictable, than for non-life insurers, which rely more on capital because of a higher proportion of unforeseeable claims.

However, the extent to which insurance firms tend to rely on capital, whether for life or non-life insurance, can also vary across jurisdictions and is generally linked to the extent to which such firms are allowed to incorporate margins to address unforeseeable claims when determining technical provisions. In other words, the more margins are allowed, the smaller the size of the capital buffer will need to be.

As mentioned above, the purpose of the stylised balance sheets for insurance activities is to reflect and illustrate the relative importance of technical provisions for insurance undertakings. The stylised balance sheets are not useful for making cross-jurisdiction comparisons relative to the proportions of capital. Such proportions largely depend on accounting, tax rules and regulatory frameworks. In Germany for instance, investments are not marked to market and technical provisions encompass a high degree of conservatism. When less margins to address unforeseeable risks can be incorporated and other accounting rules apply, the proportion and amounts of capital would in many cases be multiples of the capital shown in the German stylised balance sheet.

Annex 3

Technical provisions in insurance

Definition

Technical provisions²⁰ are the amounts estimated to be appropriate to meet liabilities arising out of insurance contracts. Technical provisions constitute the majority of the liabilities on an insurance company's balance sheet, accounting for approximately 80 per cent of life insurer's liabilities and around or over half of a non-life insurer's liabilities²¹.

For all insurance, the premiums and technical provisions are calculated according to prudent actuarial principles and methods, although these may vary by jurisdiction. An actuary is a person knowledgeable and experienced in quantitative sciences, such as mathematics, statistics, demography, probability theory and computational methods. Actuaries specialise in analysing the financial effects of contingent events and designing financial security systems to face them, such as insurance and pensions.

For life and non-life insurance, provisions are established for known and unknown obligations resulting from insurance contracts. Many jurisdictions also require special provisions to be established for unpredictable or major risk events. These provisions can be specifically earmarked – for example, for earthquakes – or be more generally available – as in the case of equalisation provisions.

There are many factors that complicate the valuation of liabilities. For example,

- a policy might describe multiple amounts available at various times with the premium payments occurring throughout the term of the policy;
- the schedule of premium payments can be flexible and at the option of the premium payer;
- the benefit amount(s) and the time(s) of benefit payment may vary depending upon some outside index; or

The benefit payment in terms of amount(s) and time(s) may be subject to a particular contingent event and to the severity of that event.

In addition, all insurers in general, and non-life insurers in particular, are vulnerable to significant changes in social, economic and judicial circumstances. For example, in some jurisdictions the courts have imposed new liabilities on insurers by reinterpreting insurance contracts so as to extend the scope of coverage beyond that which was originally intended.

²⁰ Different jurisdictions use different terminology to describe insurance terms. In this paper, we have tried to use terminology that can be generally understood by most readers.

²¹ All percentages used are approximates and provided to give the reader a relative feel for the importance of the various provisions. In practice, proportions will vary between jurisdiction, depending on the accounting and regulatory frameworks, and between companies, depending on their risk profiles and provisioning policies. The proportion mentioned are derived from the stylised balance sheets for a life and a non-life insurer presented in annex 2 as examples.

Similarly courts sometimes retrospectively impose new liabilities on insured persons thereby causing them to claim on their liability insurance contracts. Other examples include changing weather patterns, changes in employment levels or even unexpected single large events such as an earthquake or offshore rig explosion. Insurers are typically exposed to such changes in circumstances through a large number of otherwise unrelated insurance contracts and sometimes fail fully to appreciate the extent to which the risk of loss on such contracts are positively correlated.

Life insurers are less vulnerable to unforeseen risk but examples do occur. They did not anticipate the spread of AIDS in the 1980s and some insurers had to increase their technical provisions to accommodate this change in mortality and morbidity risk.

While consistent principles underpin the calculation of technical provisions, the methodology used varies by jurisdiction. There are several reasons for this, including

- There are no internationally accepted actuarial standards. In some jurisdictions, the actuarial methods and/or assumptions are mandated by the supervisory authority;
- Policy provisions differ. For instance, the level of statutory compensation required in the event of injury caused by motor accidents will vary from jurisdiction to jurisdiction;
- The accounting rules differ across jurisdictions. This is particularly significant because the valuation of the assets affects the assumptions used in determining the amount of the associated liability;
- Tax laws differ by jurisdiction. This can be significant because provisions often factor in determining companies' tax liabilities; and
- The incidence of contingent events varies by geographic location. As a result, provisions for, say, earthquake or windstorm damage will be higher in some jurisdictions.

Technical provisions vary by type of insurance coverage. The actuarial techniques used for life insurance are quite different from those used for non-life insurance and there is considerable variation among lines within each of these categories. Factors – such as, mortality, morbidity, fire, theft, auto accidents, health conditions, etc. – on which assumptions are based are quite distinct; the availability and quality of the supporting data is mixed.

Description of some of the most significant technical provisions

Active Policy Provisions (mathematical provisions): The largest component of the technical provisions of a life insurer is the active policy provisions (often accounting for about 70 per cent of a life insurer's liabilities and about 85 per cent of the technical provisions). This reflects the long time horizon of the business. Most claims do not occur until sometime – generally ten years or more – in the future. The amount and timing of these future claims must be estimated using mathematical or statistical methods. The term used for this type of provisions may differ from jurisdiction to jurisdiction. For example, some jurisdictions use the term "mathematical provisions" instead.

Typically, in long term policies, such as life, long term disability, and long term care, fixed premiums are paid in a level fashion (or sometimes they are front-end loaded) while the likelihood of claims is skewed toward the end of the coverage period. This results in

prefunding. A few life policy designs make use of increasing premium scales, which reduce or eliminate prefunding. Prefunding is not an issue for non-life insurance since these policies are generally short term policies and companies can increase premiums upon renewal.

At the inception of each policy, the expected future premiums and investment income is actuarially equivalent to the expected future expenses, benefits and profits. That is, the expected future income equals on an actuarial present value basis, the expected future expenditures plus profit.

To the extent that pre-funding is present, in the early years of a policy, the premiums received will exceed the actual cost of the risk. Consequently, at later points in the life of the policy, the value of the remaining expected premiums and investment income will be less than the remaining expected expenditures and profits. The amount required to cover this deficit is the active policy provisions. Because life insurance typically involves fixed premium policies with some degree of pre-funding, active policy provisions are very significant. In contrast, non-life insurance does not hold active policy provisions.

The calculation of these provisions is highly technical, making use of the theory of probability and statistics, the time value of money, etc. Methods vary greatly depending upon the contingencies involved and the requirements of the different jurisdictions. Where a single policy provides benefits for a number of contingencies, the calculations must address them all and take into account any interrelationships. In addition, the assets backing these provisions need to be reviewed to assess the level of credit, market, interest rate, reinvestment, and liquidity risks, as well as the matching of asset and liability cash flows.

Many companies offer life insurance policies that offer policyholders some type of bonus or rebate. Provisions must be established for these amounts.

Claims Provisions: The largest component of the technical provisions for a non-life insurer is the provision for outstanding claims (making up about 40 per cent of the liabilities and about 70 per cent of the technical provisions). Again this reflects the time horizon of the business which in the case of non-life insurance is usually much shorter. Generally, the bulk of claims are reported and settled within a few years of a policy's inception, although some types of business is considered to be long-tailed – meaning that it can take many years to settle and the settlement period can last many years (for example, Workers Compensation, Compulsory Third Party Liability for Motor Vehicles, Product and Public Liability) – and can result in high amounts of claims.

Although relatively much smaller, claims provisions are also held by life insurers. Because life insurance claims are settled soon after being reported (often within a few weeks), the total outstanding claims does not build up over time as happens for claims that are not settled for years. Thus, the claim provisions are not nearly as significant for life companies, but they are still required for the liability that does exist.

All policies require provisions for incurred claims that have not been paid in full. These are usually divided into two categories:

- unpaid incurred claims which have been reported to the company
- Incurred claims, which have not yet been reported.

Different techniques are required for each category and different methods are used depending upon the characteristics of each type of claim. Some jurisdictions require that companies use the case-by-case method. Under this method, an estimate is made for each known claim based on the available facts.

In other jurisdictions either the case-by-case method or statistical methods can be used, as long as the supervisor deems it appropriate for the particular type of business. For example, statistical methods might be used to estimate claims in short-tail classes of business where the claim amount can be easily determined because it involves a reimbursement of expenses or is closely linked to specific contract terms.

Alternatively, the case-by-case method would be used where it is difficult to assess the degree of liability and the amount payable (e.g., in the case of biological damage). These classes of insurance are often characterised by a great deal of litigation. For claims payments stretching over time, the estimate is revised with each subsequent statement as more facts are learned and the remaining future payments are reduced in number.

At all times, there will be some incurred but not reported claims. Technical provisions must be established for these claims. The amount of such unreported claims will vary greatly by company, type of insurance, type of policy servicing, etc. Companies keep extensive claims records, including historical data on when claims were incurred and when they were reported. Companies apply statistical techniques to this data to estimate the current amount outstanding. For example, the amount established for claims incurred but not reported this year will be based on historical patterns.

For both reported and unreported claims incurred, provisions also have to be established for the anticipated claim administrative expenses. This can also be done using statistical methods or by individual estimates.

Equalisation provisions and similar provisions (e.g. catastrophe provisions):

Equalisation provisions are particularly common in European jurisdictions where it has been a long-standing part of the accounting regime. Equalisation provisions and similar provisions make up about 9 per cent of the liabilities of a property and casualty insurer and about 14 per cent of the technical provisions. The aim of the equalisation provision is to equalise fluctuations in the loss pattern if, in particular

- according to experience, substantial fluctuations in the annual costs of insured events are to be expected;
- the fluctuations cannot be equalised through current premiums; and
- the fluctuations are not covered by reinsurance.

In Germany, for example, equalisation provisions must be set up for each class of non-life insurance. The maximum amount is determined using a statistical method stipulated by the supervisory authority.

If below-average claims have been incurred during a financial year, an amount (being the difference between the average amount and the amount incurred) is transferred to the equalisation provision. Where the opposite happens, an amount is withdrawn from the provision. The calculation of average claims is based on an observation period of several (e.g., 15) years.

A similar provision is used in the U.S. for group life and health policies. The mechanism employed is to develop a fund over several years, which is used to absorb fluctuating experience, thus allowing premiums to remain stable. This premium stabilisation provision is not required by supervisors but is part of the group pricing mechanism and permits less fluctuations in group premiums from year to year.

In addition, in some jurisdictions explicit provisions are established for the risk of major events ("catastrophes") occurring. These provisions may be arrived at by modelling a

particular event or set of events, or by more stochastic analysis of the policy portfolio and the exposures to events.

In some countries, similar provisions are prescribed for other risks where the liability is difficult to estimate using actuarial methods (because of the high individual risk of loss). Examples are product liability in the pharmaceutical industry or property and liability risks associated with atomic incidences. Often, in these cases, the supervisory authority mandates the valuation techniques.

Unearned Premium Provisions: Most jurisdictions require insurance companies to reimburse policyholders if the policy is terminated before the end of the period for which premiums have been paid. In many cases, the amount to be refunded is the pro-rata portion of the full premium. Sometimes this amount is reduced to reflect expenses that the company incurred.

Even in jurisdictions where there is no requirement for reimbursement, there is a need to establish an unearned premium provision. Although the premium has been collected, it has not been "earned".

Unearned premium provisions are required for both life and non-life policies making up about 1 per cent of the liabilities of a life insurance company and about 5 per cent of a property and casualty insurer's liabilities. For life policies, they are sometimes included in the active policy provisions and not separately identified. When this is the case, the active policy provision for each individual policy cannot be less than the unearned premium provision for that policy.

This amount is straightforward to calculate. It is usually done policy by policy based on the period of time that the policy has to run until the next renewal date; these amounts are then aggregated. Sometimes, simplifying assumptions are made (e.g., each policy is assumed to be halfway through the current premium period so one-half the premium is held). In certain circumstances, this amount will be nil, for instance, if all policies renew on the same date and this is the valuation date.

The unearned premium provisions are a function of the actual premiums charged to customers. In some circumstances, these premiums may, even in the short period since the rates were determined, be known to be less than is required to meet the actual cost of the risk and the administration expenses. In these cases, an additional provision equal to the shortfall can be established known as the Unexpired Risk Provision or Premium Deficiency Provision.

Technical Provisions and Accounting

Technical provisions are established to ensure that the company provides for known liabilities with respect to the insurance business that it conducts. Changes in the provisions from period to period are reflected in the profit and loss account of the company.

In the event that a policy was written, for example, just prior to the balance sheet date, the provisions ensure that premium income is spread over the life of the policy and not taken as profit immediately.

The result is that, for each policy, provisions are established on the presumption that there is a possibility of claims. This is similar to the paradigm of dynamic provisioning for loan losses in a banking environment.

The Effect of Reinsurance

Provisions may be established considering both the risk that the company has taken on as a result of the policies that it has written, as well as the risk that the company may have passed on to others through reinsurance arrangements. The extent to which companies are allowed to reduce the technical provisions to take account of reinsurance varies from jurisdiction to jurisdiction and depends on:

- the accounting rules;
- the statutory solvency requirements; and
- past practices.

Where there is some reduction allowed for reinsurance, the actual nature of the reinsurance contracts and the credit risk that might be associated with the reinsurance counterparty, among other factors, must be taken into consideration.

Annex 4

Capital frameworks in the three sectors and further references.

1. Capital Framework in the Banking Sector and further references.

1.1 The Basel Accord

The minimum capital requirements of the Basel Accord issued in July 1988 and enforceable since the end of 1992 are composed of three fundamental elements:

- A definition of regulatory capital
- Risk weighted assets
- The minimum ratio of regulatory capital to risk-weighted assets.

Definition of eligible regulatory capital

Eligible capital is made up of Tier 1 (or core capital) and Tier 2 (or supplementary capital) elements. In addition, Tier 3 capital is eligible for market risks only.

- Tier one capital consists of permanent shareholders' equity and disclosed reserves. Permanent shareholders' equity includes issued and fully paid common stock and innovative capital instruments under specific conditions. The inclusion of such instruments is limited at issuance to 15% of the bank's or Bank Holding Company's consolidated Tier 1 capital. Disclosed reserves include share premiums, retained profits and general and legal reserves.
- Tier two capital is comprised of undisclosed reserves, provided these are accepted by the supervisor and revaluation reserves including hidden values of latent revaluation reserves, subject to a discount of 55% applied to the difference between historic cost book value and market value. Tier two capital can also include general provisions/general loan loss reserves, hybrid capital instruments and subordinated term debt, subject to specific conditions.
- Tier three capital is eligible for market risks only. It consists of short-term subordinated debt issues with a minimum maturity of 2 years.

The total of Tier 2 capital is limited to a maximum of 100% of the total of tier 1 elements. Subordinated term debt is limited to a maximum of 50% of tier one elements. Goodwill is deducted from Tier 1 capital, whereas investments in unconsolidated banking and financial subsidiary companies and investments in the capital of other banks and financial institutions is deducted from total capital. The inclusion of Tier 3 capital is limited to 250% of the institution's Tier 1 capital that is allocated to support market risks.

Risk weighted assets

In calculating the capital ratio, the denominator, or total risk weighted assets, is currently determined by multiplying the capital requirements for market risks by 12.5 and adding the resulting figure to the sum of risk-weighted assets compiled for credit risk.

Risk weighted assets for credit risk is determined through the following basic formula:

$$\text{Net Exposure} \times \text{Risk weight} = \text{Risk weighted asset for credit risk.}$$

There are currently 4 risk weight categories applicable to credit risk exposures according to the degree of risk carried by such claims: 0%, 20%, 50% and 100%:

- A 0% risk weight is for instance applied to OECD central governments and banks provided they have not rescheduled their debt during the last five years.
- A 20% risk weight is applied for instance to claims on specific multilateral development banks and claims on banks incorporated in the OECD.
- A 50% risk weight is applied to loans fully secured by mortgage on residential property.
- A 100% risk weight is generally applied to all other assets.

Market risk exposure is determined either by:

Using basic and standardised formulas for determining interest rate risk, equity position risk, foreign exchange risk and commodity

$$\Sigma \text{ Capital charges of market risk components} = \text{aggregated exposure for market risks}$$

- Using internal estimates calculated from proprietary models, duly validated by supervisory authorities. Components are then aggregated and the result multiplied by 3 (supervisory add-on) for interest rate risk, equity position risk and foreign exchange risk.

$$\Sigma \text{ Capital charges of market risk components} \times 3 = \text{aggregated charge for market risks}$$

The total risk weighted assets is the following:

$$\text{Risk weighted amounts} = \text{credit risk weighted amounts} + (\text{market risk components} \times 12.5)$$

Minimum ratio of regulatory capital to risk-weighted assets:

$$\text{Minimum ratio: Regulatory Capital} / \Sigma \text{ of risk weighted assets} \geq 8\%$$

1.2 Further references

Further references can be found on the web site of the Bank of International Settlements (BIS) (<http://www.bis.org>) among the Basel Committee on Banking Supervision's publications. These include in particular the following Basel Committee publications:

- No 4: International convergence of capital measurements and capital standards (July 1988). This document is the original text of the so-called Basel Capital Accord.
- No 9: Amendment of the Basel Accord in respect to the inclusion of general provisions/general loan-loss reserves in capital (November 1991).
- No 12 b: Amendment to the Basel Capital Accord: redefinition of criteria for sovereigns to qualify for a 0% risk weight (July 1994).

- No 24: Amendment to the Capital Accord to incorporate market risks (January 1996).
- No 36: Amendment to the Basel Accord to reduce risk weights applied to regulated securities firms (April 1998).

References on the New Basel Capital Accord can also be found on the BIS's web site including the latest proposals from the Basel Committee on Banking supervision released on 16 January 2001 and comments received on these proposals.

2. Capital Frameworks in the securities firms sector and further references

2.1. The Net Capital Framework for securities firms

Apart from the US, where the Net Capital framework was developed, there are a number of jurisdictions that apply largely comparable rules based on the same principles, including Australia, Canada and Japan.

The US Net Capital Rule (Rule 15c3-1)

Rule 15c3-1 (17 CFR 240.15c3-1) prescribes minimum liquidity standards for broker-dealers. Its purpose is to ensure that each broker-dealer maintains sufficient liquid assets in excess of liabilities to satisfy promptly the claims of customers in the event a broker-dealer fails.

The rule requires broker-dealers to maintain certain specified levels of net capital. Broker-dealers that engage in a general securities business are required to maintain a minimum net capital of the greater of \$250,000, or an amount determined by employing a financial ratio. There are two methods of calculating the financial ratio. The first, known as the basic method, requires firms to not allow their aggregate indebtedness (most money liabilities) to exceed 1500% of their net capital. The second, known as the alternative method, requires broker-dealers to maintain net capital equal to at least 2% of their aggregate debit items (monies owed the broker-dealer by its customers) computed in accordance with a formula contained in Rule 15c3-3 (17 CFR 240.15c3-3). However, these firms undergo heightened supervision if their net capital falls below 5% (the early warning level) of the debit items.

Rule 15c3-1 also describes how to compute "net capital." In determining net capital, a broker-dealer first computes its net worth in accordance with U.S. generally accepted accounting principles. From that amount the broker-dealer subtracts assets not readily convertible into cash such as fixed assets, exchange seats, and most unsecured receivables. Certain approved subordinated liabilities are added back to net worth. The amount remaining after these subtractions and additions is known as the broker-dealer's "tentative net capital." The broker-dealer then subtracts from the tentative net capital prescribed percentages of the market value (otherwise known as "haircuts") of the securities owned by the broker-dealer. These deductions are intended to discount for potential adverse market movements in the securities. The resulting figure is the broker-dealer's net capital, a figure that reflects the current liquidity status of the broker-dealer, that is, its ability to pay promptly all liabilities. At this point, the broker-dealer should have one dollar of liquid capital for each dollar of liabilities.

References

- Jamroz: The Net Capital Rule, The Business Lawyer, 47 Bus. Law. 863 (May 1992).*
- Molinari, Kibler: Broker-Dealer's Financial Responsibility Under The Uniform Net Capital Rule – A Case For Liquidity, Georgetown Law Journal, 72 Geo. L.J. 1, (October 1983).*
- Macchiaroli: Who's Watching Wall Street? Secondary Mortgage Markets, (Fall 1990).*

*Article predates amendments to the net capital rule, which, among other things, substantially raised the minimum net capital requirements.

2.2 The Capital Adequacy Directive (CAD) of the EU

The CAD framework

The Capital Adequacy Directive (93/6/EEC) and its further amendments are essentially derived from the so-called Market Risks Amendment to the Basel Accord that incorporates capital charges on such risks into the Basel Accord and are applicable to large international banks since the end of 1997. The CAD applies both to banks and investment firms in the European Union. The objective was to provide for an explicit capital cushion for the price risks to which such institutions are exposed, particularly those arising from their trading activities. Market risks include interest rate risk, equity position risk, commodities price risk, foreign exchange risk, and settlement risk.

Two methods are proposed for calculating capital charges for market risks:

- (a) A standardised measurement method that introduces specific capital charges to be applied to:
 - The current market value of open positions (including derivatives) in fixed income instruments and equities in bank's and investment firms. These are based on a "building block approach" that differentiates requirements for *specific risk* resulting in adverse price movements and related to the issuer of the security were and *general market risk* related to the risk of loss arising from adverse changes in overall market prices.
 - The total currency and commodities positions in respect to foreign exchange and commodities risk respectively.
- (b) An internal models method that allows firms to use proprietary in-house models for measuring market risks and calculating their associated capital charges.

Conditions for using such models, in addition to supervisory validation, include that value-at-risk (VAR) measurements be computed at least daily, using a 99th percentile and a 10-day holding period.

The resulting capital charge is the higher of:

- The previous day's VAR
- Three times the average of the daily VAR of the preceding 60 business days

The definition of eligible capital against market exposures is also slightly modified. In addition to Tier 1 and Tier 2 elements as set out in the 1998 Basel Capital Accord, banks and

investments firms can also issue short-term subordinated debt (Tier 3 capital) with a minimum maturity of 2 years. The inclusion of such issues is limited to 250% of the institution's tier 1 capital that is allocated to support market risk.

Further references

Capital Adequacy Directive (93/6/EEC)

Basel Committee publications (available at <http://www.bis.org>):

- No 22 Supervisory framework for the use of backtesting in conjunction with the internal models approach to market risk capital requirements (January 1996).
- No 23 Overview of the amendment to the Capital Accord to incorporate market risks (January 1996).
- No 24 Amendment to the Capital Accord to incorporate market risks (January 1996).

3. Capital frameworks in the insurance sector and further references

3.1. The Risk-Based Capital Model (RBC)

The US RBC capital framework (as of 2001)

In 1990, as part of a broad agenda to improve the quality of state regulation of insurance, the National Association of Insurance Commissioners (NAIC) in the United States adopted RBC reporting requirements for U.S. Life and Property & Casualty insurers effective in 1993 and 1994, respectively. RBC reporting requirements for Health Organisations were adopted in 1998. The goal was to establish a regulatory capital requirement that was uniform throughout the states, provided the authority and incentives for early intervention, was related to risk, and to the extent practical, related to an individual insurer's operations. The capital standard adopted by the NAIC is a threshold level of capital that identifies companies needing regulatory attention. The formulas were not designed, and lack the necessary precision, to rank companies that fall above the threshold and/or to predict insolvencies. They are viewed by supervisors as an additional tool for use in solvency regulation.

There are three versions of the RBC formula, addressing life and health insurers (life formula), property & casualty insurers (P&C formula) and managed care organisations (health formula). Each formula is composed of components that address a specific risk. The formulas are similar in that each addresses almost the same set of risks. They differ in ways that reflect the levels of importance of the different risks for the types of insurers and the different ways these risks are measured. The table below shows the various components for each formula grouped according to the risks addressed.

RBC Components and Adjustment for Covariance

Life Formula (life and health insurers)	P&C Formula (property & casualty)	Health Formula (managed care org.'s)
Affiliates and Off-Balance Sheet Risks:		
C0: Affiliate Insurers & Other Off-Balance Sheet (non- derivative) Risk	R0: Affiliate Insurers & Other Off-Balance Sheet (non- derivative) Risk	H0: Affiliate Insurers & Other Off-Balance Sheet (non-derivative) Risk
Asset Risks (Market and Credit):		
C1o: Other than Equity Risk (Incl. Reinsurance Credit Risk) C1cs: Common Stock Risk C3b: Health Prepaid Provider Credit Risk	R1: Asset Risk: Fixed Income R2: Asset Risk: Equity R3: Credit Risk, and 1/2 Reinsurance Credit Risk)	H1: Asset Risks (Incl. Fixed Income and Equity) H3: Credit Risk (Includes Reinsurance and Health)

Technical Risks:		
C2: Insurance Risk	R4: Reserves Risk, 1/2 Rein. Credit Risk, Growth Risk R5: Prem. Risk, Growth Risk	H2: Insurance Risk
Interest Rate Risks:		
C3a: Interest Rate Risk		
Operational Risks:		
C4a: Business Risk C4b: Health Administrative Expenses.		H4: Business Risk
Total RBC After Covariance:		
$C0 + C4a + \sqrt{(C1b + C3a)^2 + C1c^2 + C2^2 + C3b^2 + C4b^2}$	$R0 + \sqrt{R1^2 + R2^2 + R3^2 + R4^2 + R5^2}$	$H0 + \sqrt{H1^2 + H2^2 + H3^2 + H4^2}$

The RBC amount for each component is calculated according to published formula instructions. These instructions provide one or more worksheets where “base amounts” are multiplied by “factors”. The base amounts are quantities reflecting the company’s exposure to the specified risk; the associated factor provides an amount of capital to absorb the risk. The factors were based on considerable research and reflect industry loss experience. Then, in many instances, this result is further modified to reflect individual company experience.

As an example, for asset risk, each bond in a company’s bond portfolio is assigned to a quality class (by the NAIC) with a specified factor for credit and market risk applied to each class. Then adjustments are made for the number of bond issuers (small portfolios are riskier) by increasing the result for small portfolios and reducing it for large ones. Mortgage loans in the life formula are classed as “in good standing”, “90 days overdue – not in foreclosure”, and “in process of foreclosure.” Specified factors are applied to the amount in each class. Then an adjustment is developed by comparing the individual company’s mortgage loan experience for the last three years to industry experience for this period. Other types of assets are handled similarly. Finally, asset concentration risk is addressed by identifying the ten largest counterparties among all assets, and applying the previously applied factor to each, effectively doubling the minimum capital required for each of these assets. The total of these various calculations and adjustments is the minimum capital required for the asset risk based on the individual characteristics of the company’s asset portfolio.

For the technical risks, various quantities are used to represent the exposure level depending upon the type of company. The life formula uses net amount at risk (which is the policy face amount minus the technical provisions held), the P&C formula uses technical provisions and premiums, while the health formula uses premiums as a measure of the exposure level. In each formula, these exposures are determined separately for each major business line and are multiplied by prescribed factors based upon industry experience. Among the three formulas, there appear adjustments to reflect individual company experience and operations. These include adjustments for reinsurance, excessive growth rates, past adequacy/inadequacy of provisions, time value of money, and diversification among business lines.

The calculated amounts for the various components in the formula are combined to determine the total RBC amount. A capital amount equal to the sum of the components would be required if losses from all risks occurred simultaneously. Because this would be

unlikely, this level of capital is not required. Instead, the process of combining the components “adjusts for covariance” (i.e. adjusts because most of the risks are independent). This total is less than the straight sum of the components and is referred to as the *Total Risk Based Capital after Covariance*. For the three RBC formulas, the *adjustment for covariance* assumes some of the terms are independent while others are dependent or partially dependent. Thus for all three, the *Total Risk Based Capital after Covariance* is less than the sum of the individual amounts. The adjustment formula for each is given in the table above.

Note that the terms C0, R0 and H0 are included at their full value with no reduction (i.e., these risks are treated as fully dependent). As shown in the table, these risks are for investments in affiliates and for off balance sheet risks. If a company experiences problems, then often affiliates will also experience problems, thus the dependency. Also, by including them at full value with no reduction for dependency, it becomes immaterial in the calculation of a company’s RBC amount as to where an asset is held (i.e., in a subsidiary or in the company itself). This is considered a desirable characteristic of the RBC formula.

The *Authorised Control Level RBC (ACL)*, can then be calculated as 50% of the *Total RBC after Covariance*. The ACL is the amount used in applying the RBC test. It is compared with the *Total Adjusted Capital (TAC)* which is the company’s filed statutory annual statement capital with adjustments.

Implementing the RBC requirements is the RBC Model Law, which has been adopted by almost all states. This law requires each insurance company, on a solo basis, to annually perform and report the RBC calculations as per the instructions published by the NAIC. The RBC Model Law describes four regulatory action levels. If an insurer is not in one of these action levels, no action is required (other than filing the RBC report). If a company falls into one of the action levels, then actions involving progressively more supervisory intervention are required.

Company Action Level: 150% ACL <= TAC < 200% ACL

- Insurer required to **submit a plan** to the supervisor containing a proposal for corrective actions.

Regulatory Action Level: 100% ACL <= TAC < 150% ACL

- Insurer required to submit a plan containing a proposal for corrective actions
- Supervisor shall **perform an examination** or analysis of the insurer’s operations as the supervisor **deems necessary** and issue a “Corrective Order” specifying corrective actions as the supervisor shall determine are required.

Authorised Control Level: 70% ACL <= TAC < 100% ACL

- Supervisor shall perform an examination of the insurer’s operations as the supervisor deems necessary and issue a “Corrective Order” specifying corrective actions; or
- **If the Supervisor deems it to be in the best interests of the policyholders, creditors, and the public, place the insurer under regulatory control** (e.g. rehabilitation, liquidation).

Mandatory Control Level: TAC < 70% ACL

- Supervisor shall place insurer under regulatory control.
- Law allows supervisor to delay 90 days if he believes there is a reasonable chance that the mandatory control condition can be eliminated.

Over time, the RBC formulas have been modified as new studies provided information on better measures of exposure, updated loss factor values, etc. There is a trend towards more complexity so as to more closely recognise individual company experience. One of the recent changes to the Life RBC formula (effective in 2000) was a major step towards focusing on future viability as well as more individual company precision. This change introduced cash flow projections by the appointed actuary in determining the minimum capital necessary for the interest rate risk. As all parties gain more comfort with this new technique, it is likely that its use will be expanded. Other techniques will likely find their way into the various RBC formulas that will continue this trend.

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3.2 The solvency regulations applicable to primary insurers on the basis of EEC directives

I Introduction

The essential figures needed for calculating the solvency are directly or indirectly related to the accounts made under commercial law. This paper focuses on the requirements of the various EEC directives, which are expressed as minimum requirements. In practice member states may also be applying their own additional supervisory requirements.

II Calculation of solo solvency of primary insurers

1. Non-life insurers

Directive 73/239/EEC, amended by directives 88/357/EEC and 92/49/EEC, co-ordinates and harmonises the methods for calculating the solvency of non-life insurers (property and casualty) within the EEC.

1.1 Determination of solvency requirements

1.1.1 Periods

The solvency requirement is to be determined on the basis of either the annual amount of premiums or contributions, or the average burden of claims for the past three financial years. In the case of undertakings, however, which essentially underwrite only one or several of the risks of storm, hail, frost, the last seven years are to be taken as the period of reference for the average burden of claims.

Subject to a minimum guarantee fund (see II 1.1.4), the amount of the solvency requirement has to be equal to the higher of the following two results:

1.1.2 First result (premium basis):

- The premiums or contributions (inclusive of charges ancillary to premiums or contributions) due in respect of all direct business in the last financial year for all financial years, are aggregated,
- To this aggregate, the amount of premiums accepted for all reinsurance in the last financial year is added,
- From this sum, the total amount of premiums or contributions cancelled in the last financial year is then deducted, as well as the total amount of taxes and levies pertaining to the premiums or contributions entering into the aggregate.

The amount so obtained is to be divided into two portions, the first portion extending up to 10 million units of account (one unit of account used to be equal to one ECU (European Currency Unit), on 1 Jan. 1999 the Euro was introduced substituting the ECU), the second comprising the excess; 18 % and 16 % of these portions respectively are calculated and added together.

The first result is obtained by multiplying the sum so calculated by the ratio existing in respect of the last financial year between the amount of claims remaining to be borne by the undertaking after deduction of transfers for reinsurance and the gross amount of claims; this ratio may in no case be less than 50 %.

In the case of Lloyd's, the calculation of the first result in respect of premiums has to be made on the basis of net premiums, which are multiplied by a certain flat-rate percentage fixed annually by the internal auditor.

1.1.3 Second result (claims basis):

- The amounts of claims paid in respect of direct business (without any deduction of claims borne by reinsurers and retrocessionaires) in the periods specified in II.1.1.1 are aggregated,

- To this aggregate, the amount of claims paid in respect of reinsurances or retrocessions accepted during the same periods are added,
- To this sum, the amount of provisions or reserves for outstanding claims established at the end of the last financial year is added, both for direct business and for reinsurance acceptances,
- From this sum, the amount of claims paid during the periods specified in II.1.1.1 is deducted,
- From the sum then remaining, the amount of provisions or reserves for outstanding claims established at the commencement of the second financial year preceding the last financial year for which there are accounts is deducted, both for direct business and for reinsurance acceptances.

One-third, or one-seventh, of the amount so obtained, according to the period of reference established in II.1.1.1, is divided into two portions, the first extending up to seven million units of account and the second comprising the excess; 26 % and 23 % of these portions respectively are calculated and added together.

The second result is obtained by multiplying the sum so obtained by the ratio existing in respect of the last financial year between the amount of claims remaining to be borne by the business after transfers for reinsurance and the gross amount of claims; this ratio may in no case be less than 50 %. Under certain conditions, the fractions applicable to the portions mentioned above are each reduced to a third in the case of health insurance practised on a similar technical basis to that of life assurance.

1.1.4 Guarantee fund

It must be ensured that the solvency requirements reach a certain minimum amount. One third of the calculated solvency requirements constitutes the guarantee fund, which may never fall below specified minimum levels. The amount of the Guaranteed Minimum Fund depends on the classes of insurance operated, for instance in liability insurance, credit insurance and suretyship insurance, this amount is 400.000 units of account, see Article 17 of directive 73/239/EEC.

1.2 Eligible solvency elements

- (a) The solvency margin shall correspond to the assets of the undertaking free of any foreseeable liabilities less any intangible items. In particular the following eligible solvency elements shall be included: the paid-up share capital or, in the case of a mutual insurance undertaking, the effective initial fund plus any members' accounts which meet certain criteria,
- (b) One-half of the unpaid share capital or initial fund, once the paid-up part amounts to 25 % of that share capital or fund (although in practice this is not allowable by all member states),
- (c) Reserves (statutory reserves and free reserves) not corresponding to underwriting liabilities,
- (d) Any profits brought forward,
- (e) In the case of mutual or mutual-type association with variable contributions, any claim which it has against its members by way of a call for supplementary

contribution, within the financial year, up to one-half of the difference between the maximum contributions and the contributions actually called in, and subject to a limit of 50 % of the margin,

- (f) At the request of and on the production of proof by the insurance undertaking, any hidden reserves arising out of the undervaluation of assets, insofar as those hidden reserves are not of an exceptional nature,
- (g) In a limited amount and under certain conditions cumulative preferential share capital and subordinated loan capital (for example: in the event of the bankruptcy or liquidation of the insurance undertaking, binding agreements must exist under which the subordinated loan capital or preferential share capital ranks after the claims of all other creditors and is not to be repaid until all other debts outstanding at the time have been settled).
- (h) In a limited amount and under certain conditions securities with no specified maturity date and other instruments (for example: the lender's claims on the insurance undertaking must rank entirely after those of all non-subordinated creditors).

1.3 Comparison of the sum of eligible solvency elements with the solvency requirements

The eligible solvency elements have to be added up to a sum (= solvency margin). If this sum is at least as high as the determined solvency requirements, then the insurer meets the minimum Directive requirements in this respect, but individual member states can require members to hold higher amounts.

2. **Life insurers**

2.1 Determination of solvency requirements

Directive 79/267/EEC, amended by directives 90/619/EEC and 92/96/EEC, coordinates and harmonises the methods for calculating the solvency for life insurers within the EEC.

2.1.1 Calculation

Subject to a guarantee fund and a minimum guarantee fund (see II.2.1.2), the solvency requirement must be determined as shown below according to the classes of insurance underwritten:

- (a) For certain kinds of insurance (life assurance, annuities) other than assurances linked to investment funds and other than certain transaction referred to in social insurance law, it must be equal to the sum of the following two results:

First result:

A 4% fraction of the mathematical reserves, relating to direct business gross of reinsurance cessions and to reinsurance acceptances multiplied by the ratio, for the last financial year, of the total mathematical reserves net of reinsurance cessions to the gross total mathematical reserves as specified above; that ratio may in no case be less than 85 %;

Second result:

For policies on which the capital at risk is not a negative figure, a 0,3 % fraction of such capital underwritten by the undertaking shall be multiplied by the ratio, for the

last financial year, of the total capital at risk retained as the undertaking's liability after re-insurance cessions and retrocessions to the total capital at risk gross of re-insurance; that ratio may in no case be less than 50 %.

For temporary assurance on death of a maximum term of three years the above fraction is 0,1 %; for such assurance of a term of more than three years but not more than five years the above fraction is 0,15 %.

- (b) For certain supplementary insurance, it is equal to the result of a calculation according to II.1.1.2.
- (c) For certain permanent health insurance not subject to cancellation, and for certain capital redemption operations, it is equal to a 4 % fraction of the mathematical reserves calculated in compliance with the conditions set out in the first result in (a).
- (d) For certain tontines it is equal to 1 % of their assets.
- (e) For certain kinds of assurance (life assurance and annuities) linked to investment funds and for certain operations (for example transactions associated with the administration of pension funds) it is equal to:
 - A 4 % fraction of the mathematical reserves, calculated in compliance with the conditions set out in the first result in (a) in so far as the undertaking bears an investment risk, and a 1 % fraction of the reserves calculated in the fashion, in so far as the undertaking bears no investment risk provided that the term of the contract exceeds five years and the allocation to cover management expenses set out in the contract is fixed for a period exceeding five years

Plus

- A 0,3 % fraction of the capital at risk calculated in compliance with the conditions set out in the first subparagraph of the second result of (a) in so far as the undertaking covers a death risk.

2.1.2 Guarantee fund

It must be ensured that the solvency requirements reach a certain minimum amount. One third of the calculated solvency requirements constitutes the guarantee fund. At least 50 % of this fund must be made up of the eligible solvency elements according to II.2.2 first and second indent. The guarantee fund may not, however, in general be lower than a minimum of 800.000 units of account (see Article 20 of directive 79/267/EEC). The minimum guarantee fund must then consist of the items listed in II.2.2 first and second indent.

2.2. Eligible solvency elements

The solvency margin shall correspond to the assets of the undertaking free of any foreseeable liabilities, less any intangible items. In particular the following eligible solvency elements shall be included:

- The elements mentioned under II.1.2 a, b, c, d, g, h,
- In so far as authorised under national law, profit reserves appearing in the balance sheet where they may be used to cover any losses which may arise and where they have not been made available for distribution to policy-holders;

- Upon application, with supporting evidence, by the undertaking to the supervisory authority of the member state in the territory of which its head office is situated and with the agreement of that authority:
 - (a) An amount equal to 50 % of the undertaking's future profits; the amount of the future profits is obtained by multiplying the estimated annual profit by a factor which represents the average period left to run on policies; the factor used may not exceed 10; the estimated annual profit is the arithmetical average of the profits made over the last five years in life insurance-related activities;
 - (b) Under certain conditions and restrictions the difference between a non-zillmerized or partially zillmerized mathematical reserve and a mathematical reserve zillmerized at a rate equal to the loading for acquisition costs included in the premium;
 - (c) Where approval is given by the supervisory authorities of the member states concerned in which the undertaking is carrying on its activities any hidden reserves resulting from the under-estimation of assets and over-estimation of liabilities other than mathematical reserves in so far as such hidden reserves are not of an exceptional nature.

2.3 Comparison of the sum of eligible solvency elements with the solvency requirements

The explanations under II.1.3 above apply correspondingly.

3. *Intervention powers of the supervisory authority*

For the purposes of restoring the financial situation of an undertaking the solvency margin which has fallen below the minimum required (solvency requirements), the supervisory authority shall require that a plan for the restoration of a sound financial position be submitted for its approval.

In exceptional circumstances, if the supervisory authority is of the opinion that the financial situation of the undertaking will further deteriorate, it may also restrict or prohibit the free disposal of the undertaking's assets.

If the solvency margin falls below the guarantee fund, the supervisory authority shall require the undertaking to submit a short-term finance scheme for its approval. It may also restrict or prohibit the free disposal of the undertaking's assets.

The supervisory authority may further take all measures necessary to safeguard the interests of the assured persons in the cases provided above.

4. *Outlook*

As regards non-life insurers, there is a proposal for a directive amending directive 73/239/EEC. The key points of this proposal are to raise the respective amounts of the minimum guarantee fund and the threshold amounts, and adjusting these amounts in future to the European price index, to restrict the extent to which certain solvency elements are eligible, to raise the solvency requirements in liability insurance classes where the risk profile is particularly prone to fluctuations, and to improve the intervention powers of the supervisory authorities.

As regards life insurers, a proposal for a directive has been made to amend directive 79/267/EEC. The proposed directive aims in particular at raising the amount of the minimum

guarantee fund and adjusting it in future to the European price index, at restricting the extent to which certain solvency elements are eligible, and at improving the intervention powers of the supervisory authorities.

In the long term, the solvency rules should be revised entirely.

III Calculation of solo-plus solvency for certain primary insurers that belong to an insurance group

In addition to calculating their solo solvency, primary insurers have, on certain conditions, to calculate their solo-plus (adjusted) solvency. 'Plus' in this context means that not only the insurance company, but also other companies that are part of the same group must be taken into account in the calculation. The calculation of the solo-plus solvency is coordinated and harmonised in Directive 98/78/EEC. This calculation is based on figures from the individual accounts or from the consolidated accounts drawn up under commercial law, or indirectly related to those accounts. Article 11 (2) of the directive 98/78/EEC provides that this calculation must be made for the first time in 2002 for the financial year 2001.

1. The primary insurer is a participating undertaking

If the insurance undertaking is a participating undertaking in at least one insurance undertaking, reinsurance undertaking, or third-country insurance undertaking, the solo-plus solvency must be calculated. Any related undertaking, participating undertaking or related undertaking of a participating undertaking is to be included in the calculation. Indirectly held participations must be taken account of in the calculation.

1.1 Calculation principles

It has to be made sure that the use of elements eligible for the solvency margin among different insurance undertakings taken into account in the calculation must be eliminated (elimination of double gearing). Elements eligible for the solvency margin arising out of reciprocal financing between the insurance undertaking and a related undertaking, a participating undertaking, another related undertaking of any of its participating undertakings are also not taken into account (elimination of the intra-group creation of capital). The elements eligible for the solvency margin and the solvency requirements are in principle calculated in compliance with the solo solvency calculation methods before entering the calculation method of the solo-plus solvency. Please note, however, that further restrictions apply to the elements eligible for the solvency margin in the calculation of the solo-plus-solvency, compared with the elements eligible for the solvency margin in the calculation of solo-solvency. Basically, each member state of the European Communities must provide one of the three methods outlined below as the calculation method to be applied. The calculation principles must be complied with irrespective of the method used. The adjusted solvency is sufficient when the amount resulting from the calculation as per method 1, 2 or 3 (see below) is equal to or above zero.

1.2 Method No. 1: Deduction and aggregation method

The adjusted solvency situation of the participating insurance undertaking is the difference between:

- (i) The sum of:
 - (a) The elements eligible for the solvency margin of the participating insurance undertaking, and

- (b) The proportional share of the participating insurance undertaking in the elements eligible for the solvency margin of the related insurance undertaking and

(ii) The sum of:

- (a) The book value in the participating insurance undertaking of the related insurance undertaking, and
- (b) The solvency requirement of the participating insurance undertaking, and
- (c) The proportional share of the solvency requirement of the related insurance undertaking.

1.3 Method No. 2: Requirement deduction method

The adjusted solvency of the participating insurance undertaking is the difference between:

- the sum of the elements eligible for the solvency margin of the participating insurance undertaking
- and the sum of:
 - (a) The solvency requirement of the participating insurance undertaking, and
 - (b) The proportional share of the solvency requirement of the related insurance undertaking.

Participations are valued by the equity method.

1.4 Method No. 3: Accounting consolidation-based method

The calculation of the adjusted solvency of the participating insurance undertaking has to be carried out on the basis of the consolidated accounts. The adjusted solvency of the participating insurance undertaking is the difference between:

The elements eligible for the solvency margin calculated on the basis of consolidated data, and

- (a) Either the sum of the solvency requirement of the participating insurance undertaking and of the proportional shares of the solvency requirements of the related insurance undertakings, based on the percentages used for the establishment of the consolidated accounts,
- (b) Or the solvency requirement calculated on the basis of consolidated data.

2. *The primary insurer is a subsidiary of an insurance holding company, reinsurance undertaking or third-country insurance undertaking*

In the case of an insurance undertaking the parent undertaking of which is an insurance holding company, a reinsurance undertaking or a third-country insurance undertaking, the calculation principles and methods described under III.1 above are to be applied at holding-company level. The calculation has to take into account all related undertakings of the

insurance holding company, the reinsurance undertaking or the third-country insurance undertaking.

3. *Intervention powers of the supervisory authority*

If the calculation referred to in III.1 demonstrates that the adjusted solvency is negative, the supervisory authority shall take appropriate measures at the level of the insurance undertaking in question. If the supervisory authority concludes that the solvency of a subsidiary insurance undertaking of the insurance holding company, the reinsurance undertaking or the third-country insurance undertaking (see III.2) is, or may be, jeopardised, it shall take appropriate measures at the level of that insurance undertaking.

Annex 5

Comparison of capital treatments for cross-sector investments

Purpose of the Survey

Joint Forum members expressed interest in a comparison of current capital treatments between jurisdictions of cross-sector investments. The purpose of the Survey was to identify significant differences of treatment between jurisdictions and sectors that could raise potential level playing field issues and offer, where possible, some tentative explanations of such differences.

Methodology

Group members were asked to present briefly for each jurisdiction capital treatment for cross-sector investments under the six following cases:

- A bank with a holding in a securities firm
- A securities firm with a holding in a bank
- A bank with a holding in an insurance company
- An insurance company with a holding in a bank
- A securities firm with a holding in an insurance company
- An insurance company with a holding in a securities firm

These six cases and the answers provided by nine jurisdictions are summarised in the tables below. The tables are laid out so as to compare capital treatment of holdings two by two. For instance, the capital treatment of a bank's holding in an insurance company will be compared with the reverse case in order to identify and, if possible, explain the possible differences.

A majority of jurisdictions identify the following three different cases:

- Dominant holdings, when the investing entity is in a position of exercising control over the entity he has invested in that is then considered to be a subsidiary.
- Influential holdings, when the investing entity exercises significant influence over the entity he has invested in although being a minority shareholder and not having full control. Such an entity is, at least in some jurisdictions, deemed to be an affiliate of the parent company.
- Other holding where the investing entity is not in a position to exercise through its voting rights either control or significant influence.

This is largely a consequence of the adoption of the EU Directive on Financial Services by EU Member Countries that make up seven out of the twelve jurisdictions that answered the Survey. However, some jurisdictions, for instance Japan or the United States of America,

use instead a binary approach, either the holding allows for control or it is non-controlling, and accordingly apply a capital treatment based on this distinction.

In addition, levels for assuming control vary between jurisdictions. One jurisdiction considers a holding to be dominant only when it represents at least 50% of voting rights while other participants in the Survey indicate that control can also be presumed even if the parent company does not have an outright majority of voting rights. EU Members can presume dominant influence when the holding exceeds 20% of the companies voting rights but is below an outright majority (less than half of the voting rights plus one). However, in the US for instance, control can be presumed when the holding represents at least 10% of the voting rights.

1. Banks with a holding in a securities firm and securities firm with a holding in a bank

Banks' holdings in a securities firm

Banks' holdings in securities firms are currently fully consolidated in most jurisdictions (eleven out of twelve respondents) when it is a dominant holding.

There may be several explanations to such a situation. Consolidated supervision is a long-standing feature of banking supervision of groups and was introduced at the beginning of the 1980s following the publication of the Basel principles covering consolidated supervision in the late 1970s. In addition, assets and liabilities of securities firms is essentially marked-to market, which allows for relatively easy valuations. At least in some EU countries, banks are not prevented by regulation from being "universal banks" that can offer broker-dealer services as well as banking services, and this is a common structure in continental Europe. Finally, in EU countries, the EU directive on investment services allowing for full consolidation of holdings in banks and securities firms when the holder has a dominant holding applies both to banks and securities firms.

One jurisdiction (Japan), does not allow banks to consolidate dominant holdings in securities firms but instead require such holdings to be deducted from the bank's regulatory capital. Banking supervisors in the US are also considering a similar treatment although dominant holdings in a securities firm are currently fully consolidated. The rationales for such deductions generally lie in the need to protect investors at securities firms. Regulatory capital requirements of securities firms' are set to make the firm's capital basis primarily available for compensating investors if the liquidation of its assets fails to make them whole. There is therefore an uncertainty as to what extent even part of a securities firm capital may be available to cover the group's overall exposures.

The definition of influential holdings in a securities firm tends to vary between jurisdictions with lower limits fixed at 5%, 10% or 20% and upper-limits varying between 20% and less than 50%.

In most jurisdictions, such holdings are either deducted from the bank's regulatory capital when calculated on a solo basis or consolidated pro-rata. However, treatment when considering the bank's consolidated accounts varies and can include the following range of rules:

- Deduction from bank's consolidated capital when holding less than 50% or between 5%-20% or between 10% and 20%.
- Pro-rata consolidation when holding exceeds 20%, is less than 50% and dominant holding cannot be presumed.

- In some jurisdictions, such as Japan for instance, pro-rata consolidation is restricted to joint enterprises only.

Other holdings are generally defined as holdings representing either less than 10% or less than 5% of voting rights in the securities firm. For such holdings, the rule most frequently applied is to risk-weight such holdings at 100%. However, in EU member countries, if the aggregated total of holdings of less than 10% exceeds 10% of the bank's regulatory capital, the amount in excess is deducted from the bank's regulatory capital.

Securities firms' holdings in banks

Securities firms' dominant holdings in banks are less common in practice and may even not exist in some jurisdictions, such as in The Netherlands or in Spain.

In EU countries, the treatment of such holdings mirrors the case of banks' dominant holdings in securities firms with consolidation of dominant holdings into the accounts of the mother-company. However, on a solo basis, the dominant holdings in banks are deducted from the securities firms' regulatory capital in all jurisdictions because they are equated to non-liquid assets that are therefore not available to compensate securities firms' customers.

Outside the EU, and on a solo basis, a securities firm's dominant holding in a bank is deducted from its regulatory capital. Deducted elements include hybrid capital instruments and subordinated debt since such instruments are non-liquid assets. In one case however, there is no specific treatment to such holdings that are subject to haircuts as for all investments in stocks and shares.

2. Bank with holding in an insurance company and insurance company with holding in a bank.

Bank with holding in an insurance company

Dominant holdings in an insurance company are currently deducted from a bank's capital in six jurisdictions out of twelve reviewed. However, for one jurisdiction, the deducted amount is limited to the solvency margin of the insurer, implying that capital held by the insurance company in excess of the minimum capital requirements for insurance firms under EU rules can be recognised as excess capital available at the bank's level. In another jurisdiction, a similar rule is applied to calculate a conglomerate's economic capital for regulatory purposes.

Two other jurisdictions currently apply full consolidation but one of these may in future apply deduction of holding from the bank's capital and de-consolidation. Four jurisdictions currently risk weight such holdings at 100% on a consolidated basis to address level playing field issues between banks with dominant holdings in insurance companies and the reverse case.

There is also a split regarding influential holdings that are deducted from a bank's capital in five jurisdictions but risk-weighted in seven other jurisdictions. Other holdings are generally treated as other portfolio investments and therefore risk-weighted in ten jurisdictions. Only two jurisdictions currently deduct from the bank's capital holdings representing only a fraction of the insurance company's equity.

Insurance Company with a holding in a bank

In most jurisdictions (nine out of twelve), there is no deduction from the insurance firm's capital on a consolidated basis for dominant holdings in banks. In two jurisdictions however,

the holding in a bank has to be deducted when it is a dominant holding. One jurisdiction currently requires its insurance companies to deduct from the insurer's capital requirement the regulatory capital requirement for the bank while another jurisdiction applies a similar rule for conglomerates. This implies that equity held in excess of the bank's minimum regulatory requirement is presumed to be available at the insurance company's or, more generally, at the holding company's level.

3. Securities firm with a holding in an insurance company and insurance company with a holding in a securities firm.

Securities firm with a holding in an insurance company

Rules applicable to such a case predominantly provide for deduction when such a holding is a dominant holding or an influential holding (six jurisdictions). One jurisdiction mentioned that although such a case does not currently exist in practice in its jurisdiction, the deduction would likely to be limited to the insurance firm's solvency margin to mirror the existing treatment of dominant holdings of insurance companies in securities firms. Four jurisdictions risk-weighted such holdings at 100% on a consolidated basis consistent with the treatment applied to bank's dominant holdings in insurance companies in order to address domestic level playing field issues. One jurisdiction mentioned that such a case did not currently exist but that treatment might be similar to that for banks (full consolidation). In another jurisdiction, such holdings are subject to haircuts as for all investments in stocks and shares.

For the treatment of other holdings, one of two kinds of treatments is generally applied. Eight jurisdictions treat such holdings as portfolio investments and either risk-weight them at 100% (6 EU jurisdictions) or apply normal margin requirements to the securities firm capital (Canada and Singapore). Three other jurisdictions deduct such holdings from the securities firm's capital and therefore treat them as non-liquid assets while another jurisdiction would deduct from the securities firm's equity the insurance company's solvency margin although such a case is currently theoretical. One jurisdiction had no specific rules applied to such holdings for the time being.

Insurance Company with a holding in a securities firm

Five jurisdictions do not have any specific treatment for such holdings currently in place (i.e. they do not consolidate and do not deduct the holding from capital). One EU Member State currently deducts the securities firm's minimal capital requirement from the insurance company's solvency margin when the holding exceeds 20% of the voting rights in a securities firm. Such holdings lead to pro-rata deduction of the capital requirement of the securities firm from the insurance company's solvency margin. Another EU Member State includes the net assets of such holdings in the parent's assets on a prorata basis, but does not apply any deduction for the capital requirement of the lower entity.

Two jurisdictions (Canada and Japan) currently fully deduct dominant or influential holdings in a securities firm from the insurance company's capital.

In jurisdictions that have a specific treatment for an insurance company's holdings in a securities firm, such holdings are either deducted or treated as other portfolio investments.

Comparison of rules for cross-sector investments

Table 1: Bank with holding in a securities firm and securities firm with holding in a bank

	Bank with holding in a securities firm			Securities firm with holding in a bank		
	Dominant holding	Influential holding	Other holdings	Dominant holding	Influential holding	Other holdings
Belgium	Solo basis: Deduction from capital Consolidated basis: Full consolidation	Solo basis: Deduction from capital Consolidated basis: Deduction from capital	Solo and consolidated basis: if total of other holdings in securities firms and banks exceeds 10% of bank's regulatory capital, excess is deducted. If not, other holdings are treated as 100% risk weighted assets	Solo basis: Deduction from capital Consolidated basis: Full consolidation	Solo basis: Deduction from capital Consolidated basis: Deduction from capital	Solo and consolidated basis: if total of other holdings in banks and securities firms exceeds 10% of securities firm's regulatory capital, excess is deducted. If not, other holdings are treated as 100% risk weighted assets
Canada	Consolidated basis: Full consolidation (generally, must have control. With regulatory approval can have "influential holding" subject to limits as set out in next box)	Consolidated basis: Deduction from capital (aggregate limits for "influential holdings" – 50% of regulatory capital)	Consolidated basis: Treated as other portfolio investments; 100% risk-weighted	Solo basis: Control is 50%+1 of the voting securities Deduction from capital	Solo basis: Deduction from capital when 10% of voting rights or above	Solo basis : Treated as portfolio investments when under 10% and normal margin requirements apply
France	Solo basis : Deduction from capital Consolidated basis : full consolidation	Same as Belgium (EU Directive on Investment services) Pro-rata consolidation when joint control although holding less than 50% of voting rights	Same as Belgium (EU Directive on Investment services)	Same as Belgium (EU Directive on Investment services)	Same as Belgium (EU Directive on Investment services)	Same as Belgium (EU Directive on Investment services)
Germany	Consolidated basis: full consolidation. If the holding is not consolidated, its book value is deducted from the solo as well as from the group's consolidated capital basis	Holdings exceeding 10% of securities firm's capital Solo basis and consolidated basis: Deduction from capital unless consolidated by the holding credit institution or by ultimate parent	Same as Belgium (EU Directive on investment services)	Consolidated basis: full consolidation. If the holding is not consolidated, its book value is deducted from the solo as well as from the group's consolidated capital basis	Holdings exceeding 10% of bank's capital: Solo basis and consolidated basis: Deduction from capital unless consolidated by the holding institution or by ultimate parent Qualified minority holdings (20% or more and co-managed): mandatory pro rata consolidation	Same as Belgium (EU Directive on investment services)

	Bank with holding in a securities firm			Securities firm with holding in a bank		
	Dominant holding	Influential holding	Other holdings	Dominant holding	Influential holding	Other holdings
Italy	Full consolidation	Consolidation if at least 20% of capital is held by bank	Deductions of investments (equity and hybrids) exceeding 10% of participated entities' regulatory capital. If total of other holdings including hybrids and subordinated claims exceeds 10% of bank's regulatory capital, excess deducted.	Solo basis: Deduction from capital Consolidated basis: Full consolidation	Solo basis: Deduction from capital Consolidated basis: Full consolidation	Solo and consolidated basis: if total of other holdings in banks or securities firms exceeds 10% of securities firm's regulatory capital, excess deducted. If not, other holdings are treated as 100% risk weighted assets.
Japan	Deduction from capital	Pro-rata consolidated only if joint enterprise. Otherwise deducted from capital		Solo basis. Deduction of holdings, hybrid capital instruments (non-liquid assets) from capital requirements	Solo basis. Deduction of holdings, hybrid capital instruments(non-liquid assets) from capital requirements	Solo basis. Deduction of holdings, hybrid capital instruments (non-liquid assets) from capital requirements
Netherlands	Consolidated basis: full consolidation (EU directive on financial services)	Pro rata consolidation if joint venture. Otherwise deduction from capital if holding exceeds 10% of securities firm's capital	Same as Belgium (EU directive on financial services)	Case does not currently exist. Would be similar to treatment when parent is a bank.	Case does not currently exist. Would be similar to treatment when parent is a bank	Case does not currently exist. Would be similar to treatment when parent is a bank
Singapore	Solo basis: deduction from capital Consolidated basis: full consolidation	Solo basis: deduction from capital Consolidated basis: 100% risk weighted after equity accounting and subject to 12% capital charge	Solo basis: 100% risk weighted and subject to 12% capital charge Consolidated basis: 100% risk weighted and subject to 12% capital charge	Solo basis: no specific treatment Such holdings are subject to haircuts applicable to investments in stocks and shares	Solo basis: no specific treatment Such holdings are subject to haircuts applicable to investments in stocks and shares	Solo basis: no specific treatment Such holdings are subject to haircuts applicable to investments in stocks and shares
Spain	Solo basis: N/A when the bank is the parent. If not the parent, 100% risk weighting of holding Consolidated basis: Full consolidation Conglomerate level: No specific treatment	Solo basis: N/A when the bank is the parent. If not the parent, 100% risk weighting of holding Consolidated basis: If controlled, same as "dominant holdings", if not controlled, same as "other holdings" Conglomerate level: N/A	Solo basis: N/A when the bank is the parent. If not, same treatment as consolidated level Consolidated basis: If total of other holdings exceeds 10% of bank's regulatory capital, excess deducted Conglomerate level: N/A	Case does not exist but regulation establishes the following: Solo basis: 100% risk weighting of holding Consolidated basis: Full consolidation Conglomerate level: No specific treatment	Case does not exist but regulation establishes the following: Solo basis: 100% risk weighting of holding Consolidated basis: Full consolidation if controlled, if not see "other holdings" Conglomerate level: N/A	Solo basis and Consolidated basis: If total of other holdings exceeds 10% of securities firm's regulatory capital, excess deducted Conglomerate level: N/A

	Bank with holding in a securities firm			Securities firm with holding in a bank		
	Dominant holding	Influential holding	Other holdings	Dominant holding	Influential holding	Other holdings
Sweden	Full consolidation	Deduction if holding between 5-20% Otherwise, holding risk-weighted at 100%	Less than 5%: holding risk-weighted at 100%	Full consolidation	Deduction if holding between 5-20% Otherwise, holding risk-weighted at 100%	Less than 5%: holding risk-weighted at 100%
United Kingdom	Solo basis: deduction from capital Full consolidation	Solo basis: deduction from capital Full consolidation or pro-rata: holdings over 20% if other investors have means + inclination to support lower level entity	Solo basis: deduction from capital Treatment dictated by size of investment relative to both the parent and the lower entity	Solo basis: deduction from capital Full consolidation	Solo basis: deduction from capital All holdings are pro-rata consolidated	Solo basis: deduction from capital Treatment dictated by size of investment relative to both the parent and the lower entity.
United States of America	Currently: full consolidation In future may include deduction of holding from capital and de-consolidation	Deduction if subsidiary not consolidated but nevertheless controlled Holdings in joint ventures and partially owned-companies 100% risk-weighted	Holdings in joint ventures and partially owned-companies risk-weighted at 100%	Solo basis Deduction of holdings, hybrid capital instruments and subordinated debt (non-liquid assets) from capital requirements	Solo basis Deduction of holdings, hybrid capital instruments and subordinated debt (non-liquid assets) from capital requirements	Solo basis Deduction of holdings, hybrid capital instruments and subordinated debt (non-liquid assets) from capital requirements

Table 2: bank with holding in an insurance company and insurance company with holding in a bank

	Bank with holding in insurance company			Insurance company with holding in bank		
	Dominant holding	Influential holding	Other holdings	Dominant holding	Influential holding	Other holdings
Belgium	Solo basis: Deduction from capital Consolidated basis: Deduction from capital	Solo basis: Deduction from capital Consolidated basis: Deduction from capital	Solo basis: 100% risk weighted assets Consolidated basis: 100% risk weighted assets	Solo basis: no specific treatment Consolidated basis: "solo+" treatment, capital requirement of the bank taken into account	Solo basis: no specific treatment Consolidated basis: "solo+" treatment, capital requirement of the bank taken into account	Solo basis: no specific treatment Consolidated basis: "solo+" treatment, capital requirement of the bank taken into account
Canada	Consolidated basis: Full deduction (generally, must have control...with regulatory approval can have "influential holdings" subject to limit as set out in next box)	Consolidated basis: Full deduction from capital (aggregate limits for "influential holdings" – 50% of regulatory capital)	Consolidated basis: Treated as other portfolio investments; 100% risk-weighted	Consolidated basis: Full deduction (generally, must have control...with regulatory approval can have "influential holdings" subject to limits as set out in next box)	Consolidated basis: Full deduction from capital (aggregate limits for "influential holdings" –50% of regulatory capital)	Consolidated basis: Treated as other portfolio investments; 100% risk-weighted
France	Solo basis: 100% risk weighted assets Consolidated basis: 100% risk weighted assets	Solo basis: 100% risk weighted assets Consolidated basis: 100% risk weighted assets	Solo basis: 100% risk weighted assets Consolidated basis: 100% risk weighted assets	Same as Belgium Directive for Solo + treatment to be incorporated by September 2001	Same as Belgium Directive for Solo + treatment to be incorporated by September 2001	Same as Belgium Directive for Solo + treatment to be incorporated by September 2001
Germany	No deduction Solo and consolidated basis: 100% risk-weighted assets	No deduction Solo and consolidated basis: 100% risk-weighted assets	No deduction Solo and consolidated basis: 100% risk-weighted assets	No deduction (application of investment rules to investments that are equivalent to technical provisions)	No deduction (application of investment rules to investments that are equivalent to technical provisions)	No deduction (application of investment rules to investments that are equivalent to technical provisions)
Italy	No deduction/100% risk-weighted assets Solo basis: holdings must not exceed 60% of bank's regulatory capital Consolidated basis: holdings must not exceed 40% of group's regulatory capital	Solo basis: 100% risk-weighted assets Consolidated basis: 100% risk-weighted assets	Solo basis: 100% risk-weighted assets Consolidated basis: 100% risk-weighted assets	No deductions but acquisition of controlling interests in companies not connected to insurance activities is prohibited	No deductions but acquisition of controlling interests in companies not connected to insurance activities is prohibited	No deductions but acquisition of controlling interests in companies not connected to insurance activities is prohibited
Japan	No consolidation Deduction from capital	No consolidation Deduction from capital	N/A	No consolidation Deduction from capital	No consolidation Deduction from capital	N/A

	Bank with holding in insurance company			Insurance company with holding in bank		
	Dominant holding	Influential holding	Other holdings	Dominant holding	Influential holding	Other holdings
Netherlands	Deduction of the required solvency margin of the insurer from bank's capital	100% risk weighting of book value of the holding	100% risk weighting of book value of the holding	If holding more than 20%, pro rata deduction of the capital requirement for the bank from the solvency margin of the insurer	If holding less than 20%, no deduction	If holding less than 20%, no deduction
Singapore	Solo basis: deduction from capital Consolidated basis: full consolidation	Solo basis: deduction from capital Consolidated basis: 100% risk weighted after equity accounting and subject to 12% capital charge	Solo basis: 100% risk weighted and subject to 12% capital charge Consolidated basis: 100% risk weighted and subject to 12% capital charge	Solo basis: no specific treatment Holdings subject to single-party admissibility rules applicable to investments in stocks and shares	Solo basis: no specific treatment Holdings subject to single-party admissibility rules applicable to investments in stocks and shares	Solo basis: no specific treatment Holdings subject to single-party admissibility rules applicable to investments in stocks and shares
Spain	Solo basis: N/A when the bank is the parent. If not the parent, 100% risk weighting of holding Consolidated basis: Holding risk weighted at 100% Conglomerate level: Deduction of intra-conglomerate holding from group's economic capital and of sectoral capital requirements of the lower entities	Solo basis: N/A when the bank is the parent. If not the parent, 100% risk weighting of holding Consolidated basis: Holding risk weighted at 100% Conglomerate level: If controlled, same as "dominant holdings", if not controlled, same as "other holdings"	Solo basis: N/A when the bank is the parent. If not the parent, 100% risk weighting of holding Consolidated basis: 100% of risk weighted assets Conglomerate level: Holding risk weighted at 100%	Solo basis: N/A Consolidated basis: N/A Conglomerate level: Deduction of intra-conglomerate holding from group's economic capital as well as cross-sectoral capital requirements of the lower entities	Solo basis: N/A Consolidated basis: N/A Conglomerate level: If controlled, same as "dominant holdings", if not controlled, same as "other holdings"	Solo basis: N/A Consolidated basis: N/A Conglomerate level: N/A
Sweden	Deduction from capital	Deduction when holding exceeds 5% of bank's equity or 10% of regulatory capital	100% risk weighting of book value of the holding	Currently not covered by Swedish rules	Currently not covered by Swedish rules	Currently not covered by Swedish rules
United Kingdom	Solo and consolidated basis: Deduction from capital	Solo and consolidated basis: Deduction from capital	Solo and consolidated basis: Deduction from capital	Net assets of holding included in parent's net assets on a pro rata basis No deduction for the capital requirement of the lower entity	Net assets of holding included in parent's net assets on a pro rata basis No deduction for the capital requirement of the lower entity	Investments of less than 20% subject to diversification criteria
United States of America	Currently: full consolidation In future may include deduction of holding from capital and de-consolidation	Deduction if subsidiary not consolidated in bank" accounts but nevertheless controlled Holdings in joint ventures and partially owned-companies risk-weighted at 100%	Holdings in joint ventures and partially owned-companies risk-weighted at 100%	Controlling ownership assumed if holding at least 10% of voting securities Value of holding based on US GAAP equity (non-insurance subsidiary)	Controlling ownership assumed if holding at least 10% of voting securities Value of holding based on US GAAP equity (non-insurance subsidiary)	Non-controlling ownership (less than 10%) value is market price if publicly traded other wise US GAAP equity (non-insurance subsidiary)

Table 3: securities firm with holding in an insurance company and insurance company with holding in a securities firm

	Securities firm with holding in an insurance company			Insurance company with holding in securities firm		
	Dominant holding	Influential holding	Other holdings	Dominant holding	Influential holding	Other holdings
Belgium	Solo basis: Deduction from capital Consolidated basis: Deduction from capital	Solo basis: Deduction from capital Consolidated basis: Deduction from capital	Solo basis: 100% risk weighted assets Consolidated basis: 100% risk weighted assets	Solo basis: no specific treatment Consolidated basis: No specific treatment	Solo basis: no specific treatment Consolidated basis: No specific treatment	Solo basis: no specific treatment Consolidated basis: No specific treatment
Canada	Solo basis: Full deduction from capital Control is 50% of voting rights +1	Solo basis: Full deduction from capital when 10% of voting rights or more	Solo basis : Treated as portfolio investments when less than 10% of voting rights and normal margin requirements apply	Consolidated basis: Full deduction (generally, must have control...with regulatory approval can have "influential holdings" subject to limits as set out in next box)	Consolidated basis: Full deduction (aggregate limits for "influential holdings" – 50% of regulatory capital)	Consolidated basis: Treated as other portfolio investments; 100% risk-weighted
France	Solo basis: 100% risk weighted assets Consolidated basis: 100% risk weighted assets	Solo basis: 100% risk weighted assets Consolidated basis: 100% risk weighted assets	Solo basis: 100% risk weighted assets Consolidated basis: 100% risk weighted assets	Same as Belgium Directive for Solo+ treatment to be incorporated by September 2001	Same as Belgium Directive for Solo+ treatment to be incorporated by September 2001	Same as Belgium Directive for Solo+ treatment to be incorporated by September 2001
Germany	No deduction Solo basis: 100% risk-weighted assets Consolidated basis: 100% risk-weighted assets	No deduction Solo basis: 100% risk-weighted assets Consolidated basis: 100% risk-weighted assets	No deduction Solo basis: 100% risk-weighted assets Consolidated basis: 100% risk-weighted assets	No deduction (application of investment rules to investments that are equivalent to technical provisions)	No deduction (application of investment rules to investments that are equivalent to technical provisions)	No deduction (application of investment rules to investments that are equivalent to technical provisions)
Italy	Solo basis: Deduction from capital Consolidated basis: 100% risk weighted assets	Solo basis: Deduction from capital Consolidated basis: 100% risk weighted assets	Solo basis: Deduction from capital Consolidated basis: 100% risk weighted assets	No deductions but prior authorisation required for any holding above 5% in other undertakings	No deductions but prior authorisation required for any holding above 5% in other undertakings	No deductions but prior authorisation required for any holding above 5% in other undertakings
Japan	Solo basis. Deduction of holdings, hybrid capital instruments and subordinated debt (non-liquid assets) from capital requirements	Solo basis. Deduction of holdings, hybrid capital instruments and subordinated debt (non-liquid assets) from capital requirements	Solo basis. Deduction of holdings, hybrid capital instruments and subordinated debt (non-liquid assets) from capital requirements	Solo basis. Deduction of holdings, hybrid capital instruments and subordinated debt from capital requirements	Solo basis. Deduction of holdings, hybrid capital instruments and subordinated debt from capital requirements	Solo basis. Deduction of holdings, hybrid capital instruments and subordinated debt from capital requirements
Netherlands	Case does not exist. Treatment would be similar to that for banks	Case does not exist. Treatment would be similar to that for banks	Case does not exist. Treatment would be similar to that for banks	If holding more than 20%, pro rata deduction of the capital requirement of securities firm from insurer's solvency margin	If holding less than 20%, no deduction	If holding less than 20%, no deduction

	Securities firm with holding in an insurance company			Insurance company with holding in securities firm		
	Dominant holding	Influential holding	Other holdings	Dominant holding	Influential holding	Other holdings
Singapore	Solo basis: no specific treatment Such holdings are subject to haircuts applicable to investments in stocks and shares	Solo basis: no specific treatment Such holdings are subject to haircuts applicable to investments in stocks and shares	Solo basis: no specific treatment Such holdings are subject to haircuts applicable to investments in stocks and shares	Solo basis: no specific treatment Holdings subject to single-party admissibility rules applicable to investments in stocks and shares	Solo basis: no specific treatment Holdings subject to single-party admissibility rules applicable to investments in stocks and shares	Solo basis: no specific treatment Holdings subject to single-party admissibility rules applicable to investments in stocks and shares
Spain	Case does not exist but regulation establishes the following: Solo basis: 100% risk weighting of holding Consolidated basis: 100% risk weighting of holding Conglomerate level: Deduction of intra-group holding from group's capital and of sectoral capital requirements of the lower entities	Case does not exist but regulation establishes the following: Solo basis: 100% risk weighting of holding Consolidated basis: 100% risk weighting of holding Conglomerate level: If controlled, same as "dominant holding", if not, see "other holdings"	Solo basis: 100% risk weighting of holding Consolidated basis: 100% risk weighting of holding Conglomerate level: 100% risk weighting of holding	Solo basis: No specific treatment Consolidated basis: No specific treatment Conglomerate level: Deduction of intra-conglomerate holding from group's economic capital and of sectoral capital requirements of the lower entities	Solo basis: No specific treatment Consolidated basis: no specific treatment Conglomerate level: If controlled, same as "dominant holding", if not, see "other holdings"	Solo basis: no specific treatment Consolidated basis: no specific treatment Conglomerate level: no specific treatment
Sweden	Deduction from securities firm's capital	Deduction when holding exceeds 5% of security's firm equity or 10% of regulatory capital	100% risk weighting of book value of the holding	Currently not covered by Swedish rules	Currently not covered by Swedish rules	Currently not covered by Swedish rules
United Kingdom	Solo basis and consolidated basis: Deduction from capital	Solo basis and consolidated basis: Deduction from capital	Solo basis and consolidated basis: Deduction from capital	Net assets of holding included in parent's net assets on a pro rata basis No deduction for the capital requirement of the lower entity	Net assets of holding included in parent's net assets on a pro rata basis No deduction for the capital requirement of the lower entity	Investments of less than 20% subject to diversification criteria
United States of America	Solo basis Deduction of holdings, hybrid capital instruments and subordinated debt (non-liquid assets) from capital requirements	Solo basis Deduction of holdings, hybrid capital instruments and subordinated debt (non-liquid assets) from capital requirements	Solo basis Deduction of holdings, hybrid capital instruments and subordinated debt (non-liquid assets) from capital requirements	Controlling ownership assumed if holding at least 10% of voting securities Value of holding based on US GAAP equity (non-insurance subsidiary)	Controlling ownership assumed if holding at least 10% of voting securities Value of holding based on US GAAP equity (non-insurance subsidiary)	Non-controlling ownership (less than 10%) value is market price if publicly traded other wise US GAAP equity (non-insurance subsidiary)

Notes:

- (1) Dominant holding: holdings of 50% or more or de facto control (unless otherwise stated)
- (2) Influential holding: holdings of 10% or more or de facto influence (unless otherwise stated)
- (3) Other holdings: less than 10% holdings (unless otherwise stated).

Annex 6

Members of the Working Group on Risk Assessment and Capital

**Co Chairmen: Darryll Hendricks, Federal Reserve Bank of New York
Roger Cole, Board of Governors of the Federal Reserve System**

Australia	Mr Craig Thorburn	Australian Prudential Regulation Authority
Belgium	Mr Jos Meuleman	Commission Bancaire et Financière
Canada	Ms Tanis MacLaren	Ontario Securities Commission
France	Mr Philippe Troussard/ Mr Jean-Gaspard de Brisis	Commission Bancaire
	Mr Julien Rencki Mr Pascal Chevremont	Ministère de l'Economie, des Finances et de l'Industrie
Germany	Mr Reinhard Köning	Bundesaufsichtsamt für das Versicherungswesen
Italy	Ms Laura Pinzani	Banca d'Italia
Japan	Mr Yasuhiro Fujie	The Bank of Japan
	Ms Mika Hirai	Financial Services Authority
Netherlands	Mr Alfred Verhoeven	De Nederlandsche Bank
	Mr Nico Van Dam (to 12.2000)	Verzekeringskamer
Singapore	Mr Chew Mun Yew	Monetary Authority of Singapore
Spain	Ms Marta Estavillo	Comision Nacional del Mercado de Valores
Sweden	Mr Mats Stenhammar	Finansinspektionen
United Kingdom	Ms Vyvian Bronk	Financial Services Authority
United States	Ms Barbara Bouchard	Board of Governors of the Federal Reserve System
	Mr Richard Mead	Federal Reserve Bank of New York
	Mr Alfred Gross Mr Ernest L Johnson	Virginia Bureau of Insurance
	Mr Michael Macchiaroli Mr George Lavdas Mr Randall Roy	Securities and Exchange Commission
IAIS	Mr Knut Hohlfeld Mr Yoshihiro Kawai	
EU Commission	Mr Luc Van Cauter	
Secretariat	Mr Jean-Philippe Svoronos	