THE JOINT FORUM

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INTERNATIONAL ORGANIZATION OF SECURITIES COMMISSIONS
INTERNATIONAL ASSOCIATION OF INSURANCE SUPERVISORS
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OPERATIONAL RISK TRANSFER ACROSS FINANCIAL SECTORS

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Executive Summary

1. The Joint Forum[1] of banking, securities, and insurance supervisors has been engaged in an effort to better understand risk management practices across all three sectors. In November 2001, the Joint Forum produced a report on *Risk Management Practices and Regulatory Capital: Cross-Sectoral Comparison* (November 2001 Joint Forum paper) that compared approaches to risk management and capital regulation across the sectors.

2. One of the issues highlighted in the paper was the need for supervisors to explore issues surrounding cross-sectoral risk transfer. While the November 2001 Joint Forum paper discussed the full range of risks that may be transferred across sectors, this report specifically focuses on the transfer of operational risk.

3. Banks, securities firms, and insurers - as well as their supervisors - have paid increasing attention to operational risk in recent years. This has been driven by a number of factors, including the large number of high-profile operational loss events that have occurred in recent years, the desire to increase shareholder value, and heightened supervisory attention.

4. The purpose of this paper is to foster dialogue amongst financial firms and supervisors around issues related to the transfer of operational risk across financial sectors, both within a financial conglomerate and to third parties. Transfer of risk - especially credit risk - across sectors has received increasing attention from supervisors and market participants in recent months, but comparatively little attention has been paid to the transfer of operational risk. The Working Group hopes that this paper and the ensuing dialogue will foster greater understanding on the part of firms and supervisors with regard to the issues underpinning operational risk transfer.

5. This paper will look at current and emerging industry practices, including definitions of operational risk and loss event types. The nature of insurable risks, which are most readily transferable, will be discussed. Some of the factors that drive operational risk management, including regulatory requirements (e.g., capital), the trade-off between risk and return, and the importance of mitigating the impact of low-frequency, high-severity loss events will also be discussed.

6. While the report notes a range of possible instruments for transferring operational risk, much of the report will focus specifically on insurance coverage. Insurance is not the only form of operational risk transfer, but because it is so widely used and is particularly relevant to the cross-sectoral work of the Joint Forum, much of the discussion will naturally centre on insurance practices and concepts.

7. The paper will consider a range of issues that should be taken into account by both firms and supervisors in assessing the effectiveness of operational risk transfer across sectors. These issues will be considered from the perspective of both the protection buyer and the protection seller. Firms that are buying protection should consider the extent to which operational risk is transformed to counterparty credit, liquidity, legal, or basis risk; continuing coverage guarantees (including term of remaining coverage and any insurer cancellability

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[1] The Joint Forum was formed in 1996 and comprises an equal number of representatives from each of its three parent committees: the Basel Committee on Banking Supervision (Basel Committee), the International Organization of Securities Commissioners (IOSCO), and the International Association of Insurance Supervisors (IAIS). The Joint Forum explores issues related to financial conglomerates and other issues that are of common interests to the three parent committees. More information about the Joint Forum, including any Joint Forum documents cited in this paper, may be found at *http://www.bis.org/bcbs/jointforum.htm*.

rights or renewability options); and, if applicable, the impact of transfer to related parties. Protection sellers should have the ability to assess the operational risks they assume; take into account potential correlations; manage concentration risks; and address moral hazard issues.

8. Supervisors are interested in the extent to which differences in economic or regulatory capital methodologies may drive risk transfer. In this regard, a highly simplified stylised example is presented to illustrate how recognition of insurance may affect capital requirements for both a protection buyer and protection seller.

9. A series of supervisory issues are raised for further consideration. Among these issues are the importance of sound management on the part of both protection buyers and sellers; potential capital arbitrage; the importance of managing risk concentrations; intra-group risk transfers; reinsurance; and transparency.

10. Finally, the report presents a set of conclusions. Supervisors and firms should understand better the effectiveness of operational risk transfer mechanisms and the attendant risks which may arise from such mechanisms. Firms that take on risk should have in place adequate risk management and measurement systems. Supervisors should share information within and across sectors to most effectively keep pace with developments in the market for operational risk transfer. Protection sellers are encouraged to focus efforts on improving existing operational risk transfer products rather than attempting to develop new products which offer broader "basket" coverage. To the extent that such products are developed, supervisors should monitor the use of such products. Finally, supervisors should consider the potential systemic implications of low-frequency, high-severity events which may be uninsured or uninsurable.

Part 1: Introduction

11. The November 2001 Joint Forum paper compared approaches to risk management and capital regulation across the banking, securities, and insurance sectors and highlighted similarities and differences across the sectors. The paper also presented an overview of the major risk types within each sector. One of the issues raised in the paper was the growing volume of risk transfer from one sector to another, and the need for firms[2] and supervisors to better understand the nature and implications of such transfer of risk. While this paper focuses on transfer of operational risk, these issues and the risk transfer principles underlying them are relevant to transfer of other forms of risk as well.

12. Financial services firms are exposed to a range of risks. In general, firms have several options for addressing these risks: they may decline to accept the risk (e.g., by avoiding certain business strategies or customers); they may accept and retain the risk but introduce mitigating internal controls and institute risk financing through pricing, reserving and capital; or they may accept the risk and then transfer it in part or in whole to others, either within or outside the organisation. The extent to which risk transfer mechanisms are available depends on the extent to which protection sellers offer such products. This, in turn, depends significantly on the extent to which these risks can be measured and reported, as this will strongly influence the ability of protection sellers to adequately price and reserve for

[2] Throughout this paper, the words "firm", "enterprise", "group", "conglomerate", and "organisation" have the same meaning and are used interchangeably.

the risks they assume.[3] Market, credit, and increasingly operational risk are—or are becoming—more measurable and therefore more readily transferable.[4] This paper will focus specifically on the transfer of operational risk.

13. In preparing this report, interviews were conducted with a number of firms that were active in at least two of the financial sectors to review current practices regarding operational risk management practices (see Annex 1). While this paper will focus specifically on operational risk transfer, the interviews dealt more broadly with the full range of operational risk management issues. Where possible, this paper will highlight relevant findings from these interviews.

Trends in operational risk management and regulatory capital

14. Because financial firms are in the business of taking risk, they have always had to pay attention to managing their risks, especially those of a financial nature, as a matter of striking the desired balance between risk and reward. While this has always been intrinsic to the business of financial firms, in recent decades the discipline of "risk management" has become more explicit and formalised, both within the financial sector and beyond. As part of this trend, greater emphasis has been placed on attempting to quantify risks. Until recently, risk management has tended to be siloed within firms; that is, financial and non-financial risks were often managed within particular business lines or entities rather than on an enterprise-wide basis. In recent years, financial firms have increasingly tried to take a more enterprise-wide view of risk and to manage risks across business lines and entities.[5] This has especially been true with financial risks such as market and credit risk, and of late a number of firms have also begun to attempt to take a firm-wide view of non-financial risks such as operational risk as well.

15. Financial firms and supervisors in all three sectors have paid increasing attention to operational risk in recent years. Whilst firms have always had in place internal controls and systems to minimise the losses from events such as fraud, transaction failures, etc., of late a number of firms have begun to view operational risk as a distinct and substantial class of risk (a number of banks, for instance, have expressed the view that operational risk ranks ahead of market risk and behind only credit risk in importance). As firms' activities have grown more complex, so too have their operational risk profiles. For example, whilst the growing reliance on automation has generally reduced the frequency of human errors at a number of firms (although a number of high-profile losses make clear that people risks remain substantial), system failure risks from interconnected internal and external systems have grown concurrently. Likewise, large-scale financial industry mergers, acquisitions, and consolidations test the viability of new, or newly integrated, systems. In light of these trends,

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[3] Risk measurement does not necessarily have to take place at the level of an individual firm, as protection sellers can rely on aggregate loss data across firms to measure and price for risk. Even if risk measurement is not necessary at the firm level, however, protection buyers may wish to better measure their exposure to operational risk in order to make more informed decisions about risk retention and transfer.

[4] Measurement methodologies for operational risk are still in a nascent state of development and do not necessarily result in precise measurements of operational risk exposures. Nevertheless, some firms (especially banks) indicated during the interviews that they are able to use their own internal operational loss history, external loss data together with scenario analysis, and consideration of their internal controls and operational risk mitigants as inputs to models that generate estimates of exposure to operational risk with greater precision than in the past.

[5] For more information, see the companion Joint Forum paper to this on *Trends in Risk Integration and Aggregation*.

a number of firms have devoted resources to operational risk measurement with the objective of improved risk management, including via risk transfer.

16. Banks historically managed operational risks at the business-line level and did not take a firm-wide view of operational risk except to the extent that it was viewed as all residual risks other than credit and market risk. In the past decade, however, there has been a shift as many banks have paid increasing attention to operational risk as a separate discipline. This was driven in part by the trends cited in the preceding paragraph, which were viewed as contributing to increasing losses at a number of banks. Operational risk management became a driver of shareholder value because banks viewed it as a tool to reduce volatility in earnings. Likewise, many banks began to allocate internal capital to their business lines in order to more accurately measure risk-adjusted returns on capital and to offer incentives for business lines to invest in sound internal controls.

17. Internationally active banks (and, de facto, most banks worldwide) are subject to the 1988 Basel Accord and subsequent revisions, which sets forth a common regulatory capital framework. The Accord, which explicitly requires capital for credit risk, does not have an explicit capital charge for operational risk. Nevertheless, the Basel Committee recognised when developing the Accord that banks incurred risks other than credit risk, including operational risk, and calibrated the Accord so that the 8% minimum capital requirement included a buffer for such risks. More recently, based on the development of a more credit risk-sensitive capital framework, a view that operational risk was significant and increasing in the banking industry, and recognition that a number of sophisticated banks were allocating significant amounts of internal capital to operational risk, the Basel Committee has proposed an explicit regulatory capital charge for operational risk in the revised Basel Capital Accord. For the most sophisticated banks, the Basel Committee has proposed the Advanced Measurement Approaches (AMA), which would rely on a bank's internal capital assessment for operational risk.[6] Operational risk is not just viewed as a capital issue, however. Irrespective of bank capital requirements, banking supervisors have encouraged banks to pay greater attention to operational risk management (e.g., the Basel Committee in February 2003 issued guidance on *Sound Practices for the Management and Supervision of Operational Risk*).

18. Securities firms generally evaluate and manage operational risk by monitoring processes (which may be impacted by certain regulatory capital charges and other procedural requirements as discussed below in "Factors driving operational risk transfer") and institutions within the firm. These firms believe that there are difficulties in quantifying risk based on the unreliability of assumptions regarding loss distributions, the small number of loss events for statistical estimation, and the unreliability of extreme loss events. Like banks, however, some securities firms are keeping track, to the degree possible, of losses that can be attributed to operational risk. More recently, one firm in the survey indicated during its interview that it has explored the development of quantitative indices for health indicators, such as fails or breaks (i.e., problems with back office operations), but only by product line or product unit, not for all operational risks firm-wide. Securities firms generally believe that the form of the control and management structure needed to address operational risk is dependent on the nature of the risk, e.g., whether it is intended to address potential external fraud, business disruption, or weaknesses in management processes. The risk/return framework, applicability of analytical modelling, and role of capital differ from the management of market and credit risk. The objective is to manage operational risk to an

[6] In addition to the AMA, the Basel Committee has set forth two simpler approaches (the Basic Indicator Approach and the Standardised Approach) for calculating operational risk capital based on simple multiples of gross income. Because these simpler approaches are not risk-sensitive, they do not allow for a capital reduction based on the use of insurance or other risk mitigants.

acceptable level within an appropriate cost structure commensurate with the risk and size of the organisation. Firms also believe that good operational risk management balances the need for managers to be in close proximity to business units, with reporting line separation from the business unit to the chief financial officer or other company-level management. This results in a combination of centralised and decentralised oversight.

19. There is not a single regulatory capital framework applicable to securities firms worldwide. Nevertheless, in some jurisdictions there are explicit capital charges for elements of operational risk. For example, in the United States there are capital charges and other requirements relevant to the management of operational risk at securities firms. The Net Capital Rule in the U.S., for instance, requires that a registered broker-dealer take a capital charge to the extent that the firm fails to clean up and reconcile promptly certain outstanding items (e.g., fails to receive and/or deliver, bank and securities account differences, suspense account items, and short securities differences). Further, a U.S. registered broker-dealer is required to maintain additional money in its customer reserve account as a penalty for inefficiencies in processing. For a more extensive review of U.S. regulations relating to management of operational risk, see Annex 2.

20. The evolution of operational risk management in insurance companies has progressed somewhat differently than in the other financial sectors. As in the other sectors, insurers have long been aware of operational risk and have established internal controls to prevent fraud, transaction failure, etc. Early on, insurers focused on process risk because of the volume of manual processing of information inherent in their business (e.g., policy underwriting and claims processing). However, process risk losses tended to show up in extra claims paid and in the claims experience of the company, which were automatically included in the premium calculation process. The resulting premiums charged by insurers provided for all expected claims, including those resulting from process errors. Therefore, insurers indirectly addressed what they believed to be the largest component of operational risk through the management of insurance risk. Accordingly, directly addressing operational risk was not a high priority for insurers, and no specific capital requirement was thought necessary. More recently, with increased emphasis on a more refined and comprehensive definition of operational risk, some insurance companies have expended greater effort to segregate operational risk from insurance risk. This may give the appearance that insurers have only recently begun to address operational risk, but in fact what is new is the separation of operational risk from its traditional inclusion in insurance risk.

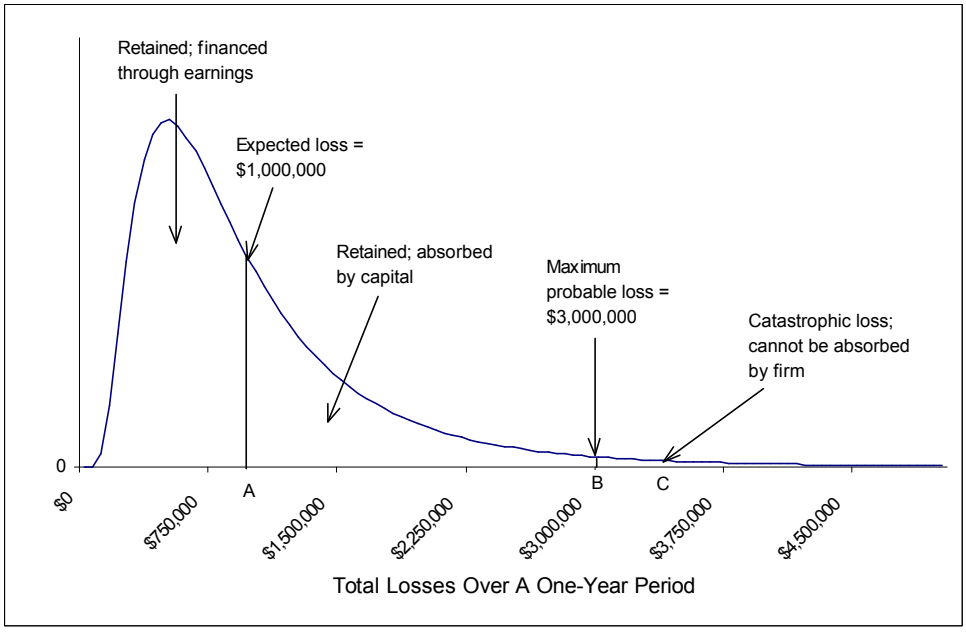
21. As with securities firms, there is no single insurance regulatory capital framework that applies across jurisdictions, so practices vary. Nevertheless, while insurance firms are not typically subject to explicit capital charges for the operational risks arising from their activities, in some cases there are implicit capital charges for such risks. European Union regulations ensuring the adequacy of technical provisions and rules applicable to investments covering the technical provisions aim essentially at limiting technical and investment risks. The solvency regulations included in the relevant EU directives are also intended to provide sufficient capital to cover the remaining, mainly non-technical, risks (e.g., operational risk). In the United States, the risk-based capital requirement for life insurance includes a capital charge for business risk, “which encompasses risks not included elsewhere in the formula” (see National Association of Insurance Commissioners, *Raising the Safety Net: Risk-Based Capital for Life Insurance Companies*, 1994). In addition, the U.S. property and casualty (P&C) risk-based capital calculation includes a capital charge based on premiums and reserves, which are affected by operational losses. This seems to indicate that U.S. life and P&C risk-based capital requirements include implicit charges for operational risk.

Operational risk transfer

22. While an increasing amount of work has been done in recent years regarding supervisory issues related to the transfer of credit and market risk from one financial sector to another (e.g., through capital market instruments such as credit derivatives or interest rate swaps), the focus upon operational risk transfer is somewhat more recent and has therefore been subject to less research. The profile of operational risk transfer has been raised in part because, as currently proposed, the revised Basel Capital Accord would allow banks to reduce their regulatory capital requirement under the AMA for operational risk through the use of insurance. Banks already transfer operational risk through insurance and other vehicles, but the new Accord could create incentives for greater operational risk transfer, even if doubts cast on the effectiveness of such transfers have led the Basel Committee to cap the maximum discount amount at 20% of total operational risk capital charge. In light of this development, it is important for firms and supervisors to consider the implications of such risk transfer.

23. Graphs 1 and 2 below illustrate, in a highly simplified manner, the impact of operational risk on capital before and after the use of insurance for a particular operational risk type. These graphs are stylised and as such do not necessarily reflect actual practice or amounts. In this case, assume that the firm is measuring its exposure to internal fraud over a one-year horizon.

Graph 1: Financing of Fraud Losses over a One-Year Period, No Insurance

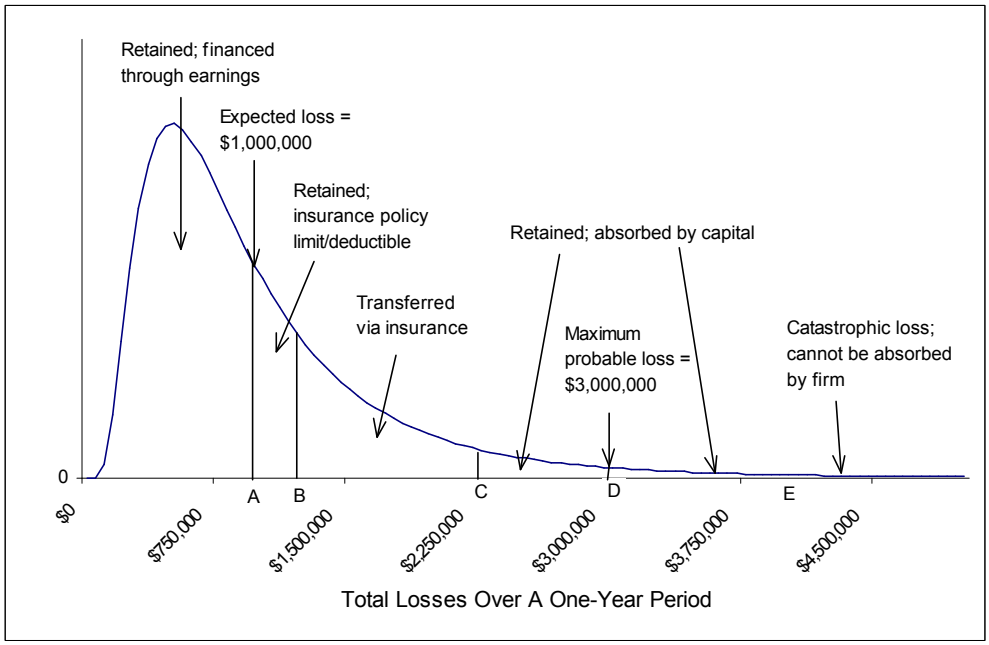


24. Graph 1 illustrates a hypothetical operational loss distribution for a particular firm, and demonstrates how the firm might finance those losses. In this case, the firm has calculated that its expected internal fraud losses are $1 million, which is the mean of the loss distribution (point A on the x-axis). All of the firm's losses up to point A would typically be absorbed through the firm's earnings. Point B on the x-axis represents the maximum probable loss, which is the amount of loss such that there is a high probability (e.g., 99%) that losses will be less than or equal to that amount. In this case, if the chosen probability is 99%, then there is a 1% chance that losses will exceed the maximum probable loss of $3 million. Typically, a firm would hold capital sufficient to absorb losses between points A and B that exceeded the level of earnings. Point C, which is generally higher than the maximum

probable loss, is the point at which the firm might exhaust its capital and be insolvent (although since this example focuses on only a single risk and a firm holds capital against a variety of other risks, in reality the loss would have to be catastrophic before it would go beyond the capacity of the firm to absorb).

25. Graph 2 below illustrates a similar loss distribution, but in this case the firm has used insurance to transfer some of the risk of internal fraud loss. As with Graph 1, this is highly simplified. In reality, protection buyers can purchase multiple, layered forms of risk protection that transfer risk to various protection sellers via various instruments to tailor their operational risk profile.

Graph 2: Financing of Internal Fraud Losses over a One-Year Period, With Insurance



26. Graph 2 above depicts the situation where insurance is obtained covering losses between points B and C. Assuming the firm's cash flow for the year is the same as for Graph 1 above, and if the risk transfer via insurance is effective, then in principle the firm would need to hold less capital than in Graph 1. By holding the same amount of capital as in Graph 1, the firm would be able to absorb losses exceeding the maximum probable loss. This is indicated by point E, which is further out on the distribution than was the case in Graph 1. In exchange for the premium, the insurance policy provides benefits that act as a form of contingent capital in the event of an insured loss. Losses beyond point E would be catastrophic and could be beyond the capacity of the firm to absorb (although, as with Graph 1, the loss would have to be quite severe to deplete a firm's entire capital base). Although not illustrated in this example, it should be noted that some firms offer catastrophic coverage to finance low-frequency, high-severity losses between points D and E.

27. This paper will highlight, where available, existing sources of information regarding operational risk transfer. Operational risk transfer is a germane topic for banking supervisors, who may need to validate the risk-mitigating impact of insurance for banks that adopt the AMA. Since most operational risk that is transferred is to the insurance sector, insurance supervisors are also interested in ensuring that firms understand the risks they assume and manage the resulting insurance risk prudently. Securities firms also transfer operational risk

via insurance and may, in the future, assume operational risk if capital markets solutions (e.g., derivative-type instruments or other forms of alternative risk transfer) are developed as a complement to insurance. Moreover, securities firms in some jurisdictions (e.g., in member states of the EU) that are not subject to an explicit capital requirement for operational risk at present are expected to be subject to such requirements in the future.

28. Some operational risk transfer mechanisms are clearly well-established (e.g., a variety of existing insurance policies). A nascent technique is to transfer a portion of a financial firm's operational risk through more recently developed methods such as derivative instruments. This paper will focus primarily on the transfer of operational risk from the banking and securities sectors to the insurance sector because that is currently the standard technique for transferring such risk. In this context, the paper will discuss the characteristics of insurable risks. Despite the focus on insurance, however, the observations set forth in this paper could also apply to other forms of operational risk transfer that may evolve in the future.

Part 2: Current and Emerging Industry Practices

Definition and scope of operational risk

29. The preliminary results of the Working Group's interviews indicate that firms have differing views as to what constitutes operational risk. Within the banking sector, there generally is convergence - at least for regulatory capital purposes - on a definition developed by industry participants and adopted by the Basel Committee: "the risk of loss resulting from inadequate or failed internal processes, people and systems or from external events." This definition includes legal risk but excludes strategic and reputational risk. There is no convergence on a generally accepted definition of operational risk in the insurance and securities sectors. Some firms take a narrower view of operational risk, focusing primarily on information systems and processing activities, while others take a much broader view and, for internal management or capital purposes, consider business and reputational risk to be elements of operational risk.

Loss event types

30. Since many firms use different definitions of operational risk, it is generally useful to break operational risk into various event types, particularly in considering the viability of operational risk transfer. In this regard, representatives from various banking and insurance firms have developed a matrix which breaks operational risk into seven loss event types, each of which can be further broken out and made more granular (see Annex 3). Many banks have found this matrix to be useful because they can more effectively manage operational risk by exploring the causative factors that lead to operational losses. Likewise, many insurers have found the matrix to be useful because it provides a framework for mapping coverage of existing and new insurance products to the loss event types and thereby provide more efficiently priced coverage.[7]

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[7] In a paper submitted to banking supervisors on the proposed capital treatment of operational risk under the revised Basel Accord (*Insurance of Operational Risk Under the New Basel Capital Accord*), a group of insurers used a variant of the Basel matrix to demonstrate how a number of the level 3 activity examples in Annex 2 are, or could be, covered by such existing insurance products as bankers blanket bond, directors and officers liability, property insurance, and unauthorised trading policies, amongst others.

31. Whilst the Basel matrix has been useful in a number of regards, it is important to note that there may nevertheless be a variety of other feasible methodologies for classifying operational loss event types. Some industry participants have noted, for example, that while the matrix is intended to be event-based, in some instances it does not clearly differentiate between operational risk causes, events, and effects (such as in the case of damage to physical assets, which can be both an event and an effect). Moreover, there may be overlap across some of the event types (for example, between internal fraud and clients, products and business practices). Consequently, industry participants and supervisors are encouraged to continue work to more effectively categorise various operational loss event types.

Insurable risks in property and casualty insurance

32. In considering the implications and effectiveness of operational risk transfer, it is useful to first consider the characteristics of risks that are most readily transferred. For the reasons discussed below, "insurable risks" are those that are most likely to be transferred effectively.

33. A financial risk is the possibility of financial loss due to the occurrence of a specified event, and the characteristics of an "insurable risk" involve the characteristics of both the specified event and the related loss. In general, there are three characteristics of an insurable P&C risk, which are described in greater detail in Annex 4. First, the risk should satisfy the requirements for, and thus benefit from, the law of large numbers[8]. Second, the occurrence of the specified event should cause an unanticipated loss. Finally, the occurrence of the event and the loss should be objectively determinable. These characteristics, while applied specifically in this paper to the transfer of operational risk, apply more generally to all types of insurable P&C risks.

34. These characteristics describe the ideal risk, but no actual risk perfectly exhibits all three characteristics. Insurers make use of deductibles, exclusions, and other techniques to compensate where an actual risk does not exhibit all three characteristics. Therefore, the terms and conditions of insurance contracts in precisely defining the risks, the losses, and the benefits to be paid enable a wider variety of risks to be insured. Without such techniques, some risks which are successfully covered by insurers would not be insurable.

Factors driving operational risk transfer

35. Where a firm has identified an operational risk, it has several choices for addressing the risk of loss. As a starting point, the firm may retain the risk but develop controls to try to reduce the frequency and/or severity of operational losses. Likewise, the firm may choose to absorb a certain level of losses and finance these losses through earnings (as shown above in Graph 1). Where the firm still incurs risk after introducing controls and self-financing through earnings, the firm may choose to either retain the risk of loss or transfer the risk through insurance or other mechanisms.

36. Many firms are especially interested in using risk transfer mechanisms to address "tail" risk (i.e., low-frequency, high-severity losses). Higher-frequency, lower-severity

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[8] The law of large numbers is a principle of probability theory which states, in essence, that as the number of independent events increases, the actual results will tend to more closely approximate the statistically expected results. So, for example, 10,000 tosses of a coin are more likely to result in 50% heads and 50% tails than will 10 tosses of a coin.

operational loss events are often relatively predictable and can be factored into a firm's expensing or budgeting practices. Where losses are less predictable or quantifiable, and potentially more severe (e.g., for natural disasters), firms may spread risk internally through geographic diversification of resources and utilisation of distant backup and recovery sites. Where firms have no ability to implement mitigating internal controls, or where there are residual risks after the implementation of internal risk spreading, it may be most efficient for them to lay off at least a portion of these risks.[9]

37. As discussed in the November 2001 Joint Forum paper, counterparties take into account a number of often overlapping factors when considering whether and how to adopt a particular mechanism for transferring risk. In the case of operational risk, both the protection buyer and seller will presumably determine that there is a benefit in transfer of some of the risk.

38. Firms will often seek to transfer risk, including via mechanisms such as outsourcing of activities[10], in order to concentrate on core business functions. Even if outsourcing does not result in risk transfer, firms are likely to outsource to those that have more expertise in this activity and, thus, a competitive advantage in managing the related risk. This could reduce the probability of losses and positively change the firm's risk profile.

39. In the case of risk transfer to an insurance company, the activity is retained so the probability of losses may be unchanged.[11] However, the insurer can cover the risk in a manner which makes more efficient use of capital than does self-insurance (e.g., through risk pooling as discussed in Annex 4). In addition, the firm's cost relative to the risk transferred is fixed to the amount of the premium. So, a protection buyer may seek to transfer those operational risks for which the fixed cost of transferring the risk (i.e., the premium) is less than the perceived (but uncertain) cost to retain the risk[12] (including both the actual loss amount from operational loss events and the non-financial cost, e.g., discomfort or risk aversion, arising from the volatility in earnings caused by such losses). The price of a particular risk transfer mechanism will therefore play a key role in determining the extent to which operational risk is transferred.

40. The protection buyer will typically take into account the existence of any regulatory requirements. In some instances firms are required to purchase certain types and levels of insurance (e.g., in a number of jurisdictions, banks are required to purchase coverage such as bankers blanket bond insurance). To the extent that regulatory capital requirements are in place for operational risk, protection buyers may seek to lower capital requirements by laying off operational risk.

41. Protection buyers are also likely to take into account whether they wish to utilise third-party arrangements such as insurance policies or other arrangements to lay off

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[9] Specifically, banks that intend to adopt an Advanced Measurement Approach for the assessment of operational risk under the revised Basel Capital Accord are paying special attention to how operational risk transfer will affect their capital requirements.

[10] Although outsourcing is outside the scope of this paper, it should be noted that, in many instances, a firm remains responsible for the risks arising from the activities it has outsourced.

[11] An added benefit of risk transfer to an insurer is the incentive to improve risk management in order to qualify for a lower premium. In many cases, the insurer will offer aid and advice on how to improve risk management. This could reduce the probability of losses.

[12] It should be noted that the cost of retaining risk may be difficult to calculate with precision, as risk retention costs could include absorption of actual losses, internal controls, redundant systems that may serve multiple purposes (irrespective of insurable losses), and the cost of capital necessary to restore operations following a non-transferred operational loss.

operational risk, or whether they prefer to use market instruments such as derivative instruments. This decision will, in turn, be driven by such factors as the protection buyer's (and the market's) experience with a given instrument or counterparty. The extent to which a protection buyer chooses to lay off precisely defined components of operational risk (e.g., the risk of a fire at a specific location), or whether the firm instead chooses to lay off a large segment of operational risk (e.g., to broadly cover employee liability), will factor into the choice of particular risk mitigants.

42. A key component of the protection seller's decision to offer protection will presumably be the trade-off between risk and expected return. A firm is not likely to assume another firm's operational risk unless it is adequately compensated for the risk.

43. As with protection buyers, protection sellers also take into account regulatory requirements and/or prohibitions (e.g., where firms are forbidden from assuming certain risks or owning particular types of financial instruments that may serve to transfer operational risk). Regulatory requirements for operational risk accepted by protection sellers via insurance policies will exist in the form of required capital and other components of solvency such as suitable technical provisions for the insurance which arises from the transfer of risk. All components of solvency, including sufficient coverage of liabilities with assets, have to be taken into account by protection sellers. To the extent that the capital and other solvency requirements for the insurance risk of protection sellers is lower due to the benefits of diversification than the operational risk capital requirement (either internal or regulatory) of protection buyers, this may heighten incentives for operational risk transfer. Differences in the cost of capital, which can drive returns on equity, may also heighten incentives for operational risk transfer.

Operational risk transfer instruments

44. This paper focuses to a large extent on the use of insurance to transfer operational risk because it has traditionally been the most commonly used instrument, and because the use of insurance by banks and securities firms is a natural cross-sectoral issue for the Joint Forum to address. Operational risk transfer, however, is not necessarily limited to insurance coverage. It is also possible to transfer operational risk through derivative instruments and other forms of risk transfer[13], and some firms have expressed an interest in developing capital market instruments such as derivatives to transfer operational risk.[14] While this report will not focus specifically on such instruments because they either have not been developed or have not been widely adopted in the marketplace, the principles in this report should be applicable to any forms of operational risk transfer that may be developed in the future.

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[13] In some cases, risks may even be absorbed by supervisors or other non-commercial entities. For example, during a period of bank failures in the United States, a number of banks employed services offered by the Federal Reserve to avoid possible service disruptions and losses in the event of the failure of correspondent banks. Likewise, governments in some countries, including the United States, the United Kingdom, and France have assumed from the private sector at least a portion of the risk of loss from terrorist events as the "insurer of last resort". In these instances, depending on the mechanisms that have been established the government may act as an insurer, reinsurer, shareholder, etc.

[14] Catastrophe bonds (cat bonds) enable firms to transfer their exposure to catastrophes to the financial markets, presumably including banks and securities firms. This paper will not address cat bonds because they typically transfer insurance risk (some components of which may derive from insured operational risks) rather than operational risk. It is conceivable, however, that similar instruments could be developed to transfer operational risk, especially for low-frequency, high-severity events, through the capital markets in the future (e.g., the owners of Tokyo Disneyland have issued cat bonds that would provide payouts in the event of a major earthquake). This may be especially relevant for low-frequency, high-severity operational loss events.

45. There are a number of traditional insurance products that have the effect of transferring operational risk from banks or securities firms. For example, fidelity bond coverage (sometimes known as financial institution blanket bond or bankers blanket bond coverage) can protect against losses from such events as dishonest or fraudulent acts committed by employees, burglary or unexplained disappearances of property, counterfeiting, and forgery. Directors' and officers' liability coverage can protect against losses incurred by directors and officers for alleged wrongful acts and by the firm for money it paid to directors and officers to indemnify them for damages. Property insurance can protect firms against losses from fire, theft, inclement weather, etc. In addition, there are a number of existing specialty policies - "rogue trader" and electronic and computer crime, for example - that cover various aspects of operational risk.

46. In contrast to these existing, usually peril-specific, forms of operational risk transfer, the market for "basket" policies that transfer a wide range of operational risks appears to be quite limited at this time. There appear to be a number of practical impediments to the development of such products. Insurance products require that the underlying risks can be defined with precision, and that there is sufficient actuarial data to confidently price the risks. The more imprecisely a risk is defined, the more difficult it is to quantify and price for the risk. In light of this difficulty, protection sellers will tend to charge prices with greater margins as a buffer against uncertainty, which will in turn tend to dampen demand by protection buyers.[15] This raises questions about the viability of instruments that provide for broad transfer of a firm's overall operational risk, and suggests that operational risk transfer solutions developed in the market will most likely focus on narrowly defined segments of operational risk that are most readily identifiable and quantifiable, at least in the near term.

Part 3: Factors in Assessing the Effectiveness of Risk Transfer

47. The following factors should be taken into account by both protection buyers and sellers to ensure that operational risk transfers are most effective.

Protection buyers' perspective

48. For any operational risk transfer program, the protection buyer should assess the extent to which the transfer is effective, especially where the risk transfer mechanism may be less well established. In order to facilitate more comprehensive operational risk management, protection buyers are encouraged to foster interaction between operational risk managers and those within the firm who are responsible for procuring risk protection.[16] Banking supervisors, for example, have found in discussions with the industry that, until recently, it has not been uncommon for there to be little or no interaction between financial

[15] It should be noted, however, that insurance markets tend to be cyclical. When insurance markets are "soft", market pressures may limit the ability of insurers to demand greater margins as a buffer against uncertainty.

[16] Whilst it is the case that those within a firm who purchase insurance are in the business of managing risk, the term "operational risk managers" in this paper refers to those individuals who have been specifically tasked with the enterprise-wide management of operational risk. In a number of firms interviewed in the preparation of this paper, these individuals were separate organisationally from those responsible for procuring insurance coverage. In practice, at a number of firms it may be the case that those responsible for purchasing insurance have de facto management responsibility for at least a subset of operational risks, e.g., property and casualty losses, but do not necessarily have responsibility for the full range of operational risks.

risk managers and insurance purchasers.[17] Those banks that have encouraged discussion amongst these groups have indicated that they are able to make more rational and informed decisions about whether to retain risks or transfer them out of the firm. The applicable factors for assessing the effectiveness of operational risk transfer are as follows:

Counterparty credit risk

49. As is true for virtually any form of risk transfer, when operational risk is transferred from one party to another, the operational risk is transformed into a form of credit risk for the protection buyer. In this instance, the credit risk derives from the possibility that the protection seller will be unable to pay the protection buyer following a covered loss event. Consequently, protection buyers should have in place due diligence policies and procedures to assess and control the resulting credit risk (e.g., by taking into account such factors as external credit assessments and capital adequacy of the protection seller and counterparty concentration concerns). In general, concerns about counterparty credit risk decrease as the creditworthiness of the protection seller and/or counterparty diversification increases.

50. Protection seller credit ratings or financial strength ratings issued by credible rating agencies can be an important input into the protection buyers' assessment of counterparty risk, although firms should be cautioned not to rely excessively or exclusively on ratings, which are often a lagging indicator of a firm's financial condition. Protection buyers should conduct a thorough, comprehensive, and well-documented analysis of credit risk arising from any counterparty relationship, including with protection sellers.

51. Protection buyers should take into account the capacity of specific counterparties, as well as the market as a whole, to absorb losses when assessing the effectiveness of their operational risk transfer. Moreover, protection buyers should consider the possibility that their own financial condition or broader market conditions could force them to rely on capital rather than insurance—potentially on short notice—at a time when capital may be more difficult or expensive to raise. Because negative developments (e.g., unexpected increases in claims or declines in investment returns), the willingness of protection sellers to write business on the basis of a constant premium or risk amount will vary over time. The amount of risk covered by new insurance contracts and/or the level of premiums may also change. Moreover, negative developments may reduce the financial strength of a protection seller in relation to other protection sellers. Protection buyers should therefore assess the extent to which market developments and the capacity of protection sellers may drive down counterparty credit quality or increase concentration risk. Protection buyers should also take into account the extent to which the protection seller is subject to effective supervision.

52. Since one of the primary motivations for transferring operational risk is to reduce the risk of the firm, the desired risk reduction may not be fully realised if operational risk is transferred to a very small number of counterparties, resulting in enhanced credit risk due to concentration. Where this is the case, the protection buyer could be vulnerable to sudden deterioration in the ability or willingness of the protection seller to pay out in the event of a loss or series of losses, which highlights the importance of carefully assessing protection seller creditworthiness. The Working Group understands that there are longstanding reasons—relationship management and pricing benefits, for example—for firms to maintain a limited number of relationships with protection sellers. Nevertheless, in considering the effectiveness of risk transfer, protection buyers should take into account the extent to which

[17] Regardless of the relationship between risk managers and insurance purchasers within a company, insurance companies should have contact with the risk managers of protection buyers in order to most effectively assess the risks they intend to insure.

there is concentration in the counterparties to which their operational risk has been transferred, and should balance risks arising from concentration against the creditworthiness of such counterparties. It may, for example, be a safer and sounder practice to transfer risk to a small number of counterparties with strong creditworthiness than to transfer risk to a more diverse group of counterparties with mediocre creditworthiness.

Liquidity risk

53. For a variety of reasons, including the need for investigation by both the protection seller and buyer, loss transfer mechanisms vary in the likely time span from a loss event to recovery via payment from the protection seller. This is not necessarily a problem for relatively small losses, but where a significant loss has been incurred, delayed payment could heighten liquidity risk for the protection buyer. From a liquidity standpoint, then, it is generally preferable from the protection buyer's perspective for payout to be on a "pay first, ask questions later" basis. Where this is not the case (claims where there is disagreement between the protection buyer and protection seller about the scope of coverage, for example, may be subject to lengthy litigation), the viability of risk transfer may be called into question and the protection buyer should have adequate alternative sources of liquidity to operate in the time gap between the point of financial impact of an event and the date of payment. In addition, the protection buyers should have in place a sufficient capital buffer such that a lengthy payment gap does not threaten the firm's viability.

Legal risk

54. Effective risk transfer requires that both the protection seller and protection buyer have a clear understanding of precisely which perils or events are covered, as well as any exclusions that may exist. In insurance contracts, deductibles, co-pays, and exclusions are used to specify the understanding of the protection buyer and seller as to the scope of coverage of the contract. These are used to define and shape coverage, to eliminate double insurance, to eliminate coverage that may not be needed or priced for, to eliminate uninsurable exposures, and to reduce or eliminate moral hazard. The protection buyer should understand the nature of any exclusions so that there are no surprises as to whether or not a loss event is covered. Likewise, understanding the scope of coverage should help the protection buyer to reduce unintended gaps or overlaps in risk coverage.

55. Where contractual terms of coverage are unclear, or where the protection seller and buyer have different views on the extent of coverage, there is a greater likelihood that payment will either be denied or litigated. In this instance, the operational risk for which the protection buyer seeks coverage may be transformed to a different form of operational risk, i.e., legal risk. It is incumbent upon all parties to the transfer of operational risk to have as clear an understanding of the scope of coverage as possible in order to maximise agreement on the extent of coverage and minimise disagreements in the event of a loss. For the protection buyer, this understanding of the scope of coverage should extend not only to the parties within the firm responsible for procuring protection, but also to those within the firm who are responsible for operational risk management. Certainty of payout may especially be an issue if new products are developed which broadly cover a range of operational risk-related perils within an overall blanket structure. Such products could have either greater or lesser certainty of payment depending on how the contracts are written, how they interact with existing peril-specific products, which perils are excluded, etc. To the extent that firms take into account the effects of operational risk transfer in their economic or regulatory capital measures, the capital benefits from risk transfer should be consistent and proportionate to the amount of risk that is transferred.

56. A potential source of uncertainty in operational risk transfer, particularly with regard to innovative or non-traditional products, is the possibility that a given product or form of coverage might not have been accorded favourable legal, tax or regulatory treatment. This is not to suggest that only currently existing products are capable of providing meaningful risk transfer. Nor should it suggest that traditional products are immune from contractual uncertainties (e.g., a number of protection sellers have incurred losses as a result of court rulings on asbestos and other environmental hazards). Nevertheless, in assessing the extent to which a protection buyer has legitimately transferred operational risk, one consideration should be the extent to which a product or form of coverage has been legally tested and received the desired judicial interpretation in the relevant jurisdiction(s). To maximise legal certainty, a protection buyer may wish to limit the extent to which it avails itself of untested products on an aggregate basis.

Basis risk

57. In the case of derivatives or alternative risk transfer mechanisms, the event giving rise to the payment from the protection seller may intentionally be somewhat different from the event demanding payment from the protection buyer. Without care, such differences in payment basis may be large enough to materially affect the risk transfer. Even in traditional insurance products, basis risk may arise where insufficient limits or restrictive contract terms provide only partial coverage for a loss, which may result in a less effective hedge than intended by the protection buyer. These risks should be clear to the protection buyer so that it may ascertain whether the level of protection is appropriate.

Duration of coverage

58. The effective term of coverage (e.g., the remaining term of an insurance policy prior to expiration) may be an important consideration in assessing the effectiveness of risk transfer. In general, a longer remaining term of coverage may give greater assurance to the protection buyer. As the remaining term of coverage diminishes, there is greater uncertainty regarding the protection buyer's ability to acquire comparable protection upon expiration. Where a firm factors insurance coverage into its capital allocation for operational risk, the remaining term of coverage should be consistent with any regulatory and economic capital benefit. For example, if a firm is holding capital as a buffer for losses over a one-year horizon but is insured for a shorter period (as is typically the case, since most existing insurance policies have a one-year initial term of coverage and, consequently, a shorter residual term), then the mismatch between the remaining term of the policy and the firm's solvency horizon should be taken into account (e.g., through appropriate haircuts) in calculating the firm's capital requirement.

Cancellability

59. Related to certainty and duration of coverage is the notion of cancellability. A risk transfer mechanism that can be cancelled or materially altered by the protection seller on short notice raises questions regarding the efficacy of such transfer. For risk transfer to be most effective, the protection buyer should have as much certainty as possible that the protection mechanism will remain in place for the full term of coverage (with reasonable exceptions for things like non-performance on the part of the protection buyer).

Transfer to affiliated parties

60. For a variety of reasons, firms may transfer risk to an affiliated party such as a captive insurer instead of transferring the risk to a third party. While risk transfers between

affiliates may improve some affiliates' risk profiles and solo regulatory capital positions, they are unlikely to alter the group's overall risk profile. In this regard, the implications for firm safety and soundness of the transfer of funds and capital between affiliates warrant further exploration.

61. Where operational risk is transferred to an affiliated party, the effectiveness of risk transfer will be enhanced if the risk is transferred outside the group through reinsurance or other mechanisms (although supervisors may be hesitant to recognise any risk transfer to an affiliated party, regardless of whether or not that risk is then transferred outside the group). Likewise, the effectiveness of risk transfer may be enhanced if the affiliate, such as a captive insurer, is subject to specific regulatory requirements (e.g., reserve requirements). While there may be a variety of reasons for utilising intra-company risk transfer mechanisms, as a general rule the overall risk profile of the firm is only improved where risk is transferred out of the firm entirely. Likewise, to the extent risk is retained in an affiliated insurer (and therefore in the financial group), the effectiveness of risk mitigation will depend in large part on the extent to which the affiliated insurer can take advantage of pooling with other entities. If an affiliated insurer writes few policies, this will not only minimise the benefits of diversification of risk, but will also make it more difficult for the affiliate to measure its risk and price its coverage accordingly. On the other hand, many captive insurers are not pure captives but also write insurance business with third parties.

Captive Insurance

Captive insurance is a form of alternative risk transfer in which a firm establishes an affiliated, separately licensed insurance company known as a captive. Often established in offshore domiciles (at year-end 2002, almost half of all active captives were domiciled in either Bermuda or the Cayman Islands), captives can take a number of legal forms, the description of which goes beyond the scope of this paper. According to A.M. Best, as of year-end 2002, there were 4,526 active captives worldwide. Of these, about 55% had parent/sponsors based in the United States and 26% had parent/sponsors based in Europe. It is not clear what proportion of these captives were affiliated with banks, securities firms, or insurers. Firms may establish captives for a number of reasons, including the desire to realise cost savings, gain more favourable tax treatment, centralise the management of insurable risks, or gain direct access to the more flexible reinsurance market. Formation of captives tends to increase as insurance premiums rise and firms seek more cost-effective forms of risk transfer.

Captive insurance made the headlines in 2002 when it was reported that a Bermuda-based captive insurer owned by the Arthur Andersen LLP accounting firm declined to fund a major legal settlement due to the captive's financial position. Arthur Andersen later agreed to recapitalise its captive in order to pay on the legal settlement.

Protection sellers' perspective

62. In the case of a firm selling protection, the operational risk of the protection buyer, after applying relevant actuarial methodologies, is transformed into the insurance risk (technical risk) of the seller. Therefore, factors governing the decision to accept the risk, as with any other risk for which policy coverage is granted, are based on the underwriting criteria and practices of the insurance company. Underwriting includes risk appraisal, premium rate setting, contract drafting, etc. Some of the aspects of underwriting, which apply to all risks for which insurance is offered but are used here in the context of operational risk, are described below. These factors would also apply to a protection seller that has assumed operational risk via the capital markets or other forms of alternative risk transfer.

Operational Risk Assessment

63. Effective operational risk transfer requires that the protection seller has the ability to effectively assess the risks that it assumes. This includes the ability not only to identify the potential loss events and their severity, but also the ability to assess the protection buyer's capability and inclination to mitigate, manage, and control the likelihood and impact of these events (which highlights the importance of interaction between the protection seller and the protection buyer's risk managers). If the protection seller does not have a comprehensive understanding of the risk that it assumes from a buyer—and how that risk interacts with risks taken on from other buyers—then it may not be able to adequately price its risk and sufficiently cover losses.

Correlation of Risks

64. In order to best manage the risks that a protection seller has taken on, the firm should have as strong an understanding as possible of the correlation of risk across protection buyers and product lines in its portfolio. Failure to take into account through pricing or diversification the possibility that certain operational risks could be correlated may impair the ability to cover large loss events. While there may be sufficient firm and/or industry data to estimate loss correlations for certain elements of operational risk (e.g., natural disasters that are common to particular geographic regions), this may be more difficult for other operational risk event types. In addition, protection sellers should take into account the possibility that operational loss events that normally have a very low correlation could become highly correlated in certain stress situations, as happened for events occurring on and closely following September 11, 2001. Not only did the events of September 11 result in losses for a number of protections sellers, but the geographic and event concentration of otherwise diverse risks also resulted in losses affecting the property, liability, business interruption, workers compensation, airline, life, and health business lines.

Effectiveness of Risk Transfer (Credit Risk)

65. To the extent that an operational risk protection seller transfers risk to third parties (e.g., reinsurers), it then becomes a protection buyer and should consider the factors given above in the section titled "Counterparty credit risk" to assess the risk transfer from the buyer's perspective. Other risks discussed above in "Protection buyers' perspective", including liquidity and legal risk, may also arise and should be assessed from the buyer's perspective.

Risk concentrations

66. Protection sellers may be vulnerable to concentrations to certain counterparties (including reinsurers), geographic areas, or operational loss event types. Risk concentration is a particular concern where the insurer is exposed to losses from low-frequency, high-severity events. Where this is the case, the protection seller should manage the risk of loss through greater diversification and/or reinsurance.

Moral hazard

67. A potential problem for any protection seller is that of moral hazard, which is the possibility that the existence of protection may make a protection buyer less diligent in taking steps to prevent the occurrence of a loss event. For example, in the case of operational risk, if a firm bought protection against loss due to fraud, the existence of this protection could (intentionally or not) make the protection buyer more lax in implementing or enforcing fraud prevention controls. Protection sellers have several tools for addressing the moral hazard

problem. Deductibles and similar mechanisms, for example, require the protection buyer to share in any losses. Likewise, protection sellers can monitor protection buyers to ensure that they have taken steps to prevent losses; in the case of fraud, for example, the protection seller could review the protection buyer's internal controls and refuse to write coverage if the fraud prevention controls were inadequate. Finally, protection sellers can increase the cost of protection going forward where a protection buyer has incurred losses. Each of these tools helps to create incentives for protection buyers to reduce losses instead of relying solely on loss protection to absorb losses.

Stylised example

68. In weighing the impact of insurance on operational risk transfer, it may be useful to consider a stylised example of how firms and supervisors may take into account the impact of insurance coverage. This example is highly simplified and therefore does not reflect the complexities inherent in any firm's overall risk and capital assessment program.[18] Moreover, the working group's interviews with firms regarding risk aggregation and operational risk indicated that few firms incorporate the impact of insurance in their internal capital assessments, so the example presented here is illustrative and does not reflect current or emerging industry practice.

69. In this case, a firm with banking and securities activities wants to determine how much internal capital to hold against operational risk. The firm has $2 billion in assets and internal capital of $75 million. For the sake of simplicity, the firm does not break its risks out into multiple business lines, but instead treats the entire firm as a single business line. The firm undertakes a combination of statistical analysis of its loss history, scenario analysis based on a combination of qualitative factors and reference to external loss events, and consideration of its control environment to come up with a target level of economic capital at a desired confidence interval. The firm's analysis in table 1 reveals that, before considering the risk mitigating impact of insurance, it should hold $24 million in capital for operational risk—32% of total economic capital—based on the following assessment (for the sake of conservatism, the firm assumes a correlation of 1.0 across loss event types and does a simple sum of risk exposures):

Table 1

Event type	Risk Exposure
Internal fraud	$2,000,000
External fraud	$2,000,000
Employment practices and workplace safety	$1,000,000
Clients, products & business practices	$5,000,000
Damage to physical assets	$8,000,000
Business disruption and system failures	$5,000,000
Execution, delivery & process management	$1,000,000
Total	$24,000,000

[18] This example is intended to be illustrative, and as such does not reflect actual practice. Only the most sophisticated firms (e.g., internationally active banks subject to the AMA under the Basel Capital Accord) are likely to account for insurance in their capital calculations. In practice, such firms are likely to have multiple business lines in multiple jurisdictions, and are likely to utilise a wide range of potentially complex insurance policies and other forms of operational risk transfer.

70. The firm recognises that insurance has a mitigating effect on its total operational risk exposure, which it seeks to reflect in its overall capital assessment. In this simplified case, the firm has three insurance policies. The first is a financial institution blanket bond policy with a limit of $4 million and a deductible of $1 million, or net coverage of $3 million. The firm believes that this $3 million coverage should equally offset the risk of loss due to internal and external fraud, so coverage for each of these sources of loss is $1.5 million. The second policy is directors' and officers' liability policy with a limit of $5 million and a deductible of $1 million, or net coverage of $4 million which the firm believes reduces the risk of loss due to clients, products, and business practices. Finally, the firm has property coverage with a limit of $8 million and a deductible of $1 million, or net coverage of $7 million, which the firm believes reduces the risk of loss due to damage to physical assets.

71. In taking into account the impact of insurance, the firm discounts the effect of insurance to reflect the possibility of failure to realise claims, delays in payment, short residual terms of the policies, etc. In this case, the firm is relatively conservative and applies haircuts of 50% to the net coverage figures for its financial institution blanket bond and directors' and officers' liability coverage. Based on past experience and perceptions of greater certainty of payout, the firm applies a smaller haircut of 20% to its property coverage.

72. The resulting figures are netted against the original risk exposures, and the resultant exposures post-insurance are totalled again. In this case, the resulting risk exposure and capital figure is reduced by 38% from $24 million to $14.9 million, which is just under 20% of total internal capital. This is reflected in table 2:

Table 2

Event type	Original Risk Exposure	Effective Insurance Coverage	Haircut	Adjusted Insurance Coverage	Net Risk Exposure
Internal fraud	$2,000,000	$1,500,000	50%	$750,000	$1,250,000
External fraud	$2,000,000	$1,500,000	50%	$750,000	$1,250,000
Employment practices and workplace safety	$1,000,000	$0		$0	$1,000,000
Clients, products & business practices	$5,000,000	$4,000,000	50%	$2,000,000	$3,000,000
Damage to physical assets	$8,000,000	$7,000,000	20%	$5,600,000	$2,400,000
Business disruption and system failures	$5,000,000	$0		$0	$5,000,000
Execution, delivery & process management	$1,000,000	$0		$0	$1,000,000
Total	$24,000,000	$14,000,000		$9,100,000	$14,900,000

73. From the insurer's perspective, the insurance coverage would be treated as $14 million and pricing, reserving, capital, risk management, and financial reporting would be based on this amount.

Part 4: Supervisory issues

74. In addition to the factors listed above, there are several other supervisory issues which merit further consideration. Among these issues are the following:

Ability of protection buyers' management

75. It would be appropriate for supervisors of protection buyers to review the protection buyers' overall operational risk management policies. Moreover, where possible, supervisors should assess protection buyers' understanding of the risk that has been transferred and ability to effectively manage any residual risks.

Ability of protection sellers' management

76. It would also be appropriate for supervisors of protection sellers to review a firm's policies with regard to pricing and, where possible, assess the ability of the protection seller to properly price the transfer and manage the risk it has assumed. This is naturally the supervisor's responsibility for all risks underwritten by a protection seller, but this assessment should be adapted to the specifics of the operational risk transferred from a protection buyer. There are a variety of factors that go into the pricing of risk protection, but where a protection seller's prices are consistently and substantially below those of the competition, supervisors may question whether this is a function of a sound and deliberate business strategy or a more sophisticated risk measurement system or, alternately, whether the protection seller is underpricing risk and may therefore lack the financial strength to meet its commitments (e.g., see the case of HIH Insurance below). Supervisors should also play a role in monitoring protection sellers' businesses to ensure that specific firms are adequately reserved and capitalised relative to the risk that they have assumed.

77. Likewise, to the extent that protection buyers reduce their capital levels on the basis of operational risk transfer, the supervisors of protection buyers should determine that any capital reduction is commensurate with the risk that is actually transferred. Pricing of products can also be an indicator of relative creditworthiness.

Capital arbitrage

78. The transfer of operational risk between financial sectors gives rise to the potential for regulatory capital arbitrage. This may particularly be the case where operational risks are transferred from one part of a conglomerate to another. This suggests that there could be advantages for supervisors in taking a group-wide perspective on firm risk and capital adequacy. It may be that, as in the stylised example above, it is appropriate that less capital would be held by the protection seller than the protection buyer for the risk of loss from the same event because the protection seller benefits from pooling of risks. In any event, supervisors should be cognisant that capital requirements could encourage operational risk transfer. Where it is a consideration for capital adequacy, supervisors should seek to determine the extent to which operational risk transfer is done to mitigate risk, or whether it is done with the sole or primary purpose of favourably altering capital ratios. The November 2001 Joint Forum paper highlighted the need for firms in various sectors to take a prudent approach to the management of risks that they take on from other sectors. Attendant to this is an increasing need for the sharing of information between sectoral supervisory authorities.

Risk concentrations

79 As discussed in Part 3, it is important that individual protection buyers take measures to identify, monitor, manage and control concentrations to protection sellers to reduce the vulnerability of loss due to the deterioration in the credit quality of a given counterparty. This is also true for supervisors at a broader, systemic level. To the extent possible, supervisors should be aware of risk concentrations and should monitor exposures

to particular protection sellers to determine whether the failure of a given protection seller would result in a severe systemic disruption.

Intra-group risk transfer

80. The use of captive insurers, and potentially other forms of intra-group operational risk transfer, warrants further investigation. While captives are used to capture cost savings or generate tax benefits, it would be important that such savings be realised from the reduction of overhead and the elimination of third-party profits, rather than from a reduction in the adequacy of the technical provisions against the insured risk. Further, the use of captives strengthens the argument for taking a group-wide perspective on risk, as the organisation's overall risk profile is unaltered by internal risk transfers (indeed, some supervisors do not recognise such intra-group transfers unless they are 100% collateralised).

Reinsurance

81. Given that a substantial portion of risk transfer is ultimately made from primary insurers to reinsurance companies, it is important to consider the issues that may arise from such transfers. Reinsurers are an important source of risk diversification within the insurance industry. They are often subject to indirect regulation, which may be different than the direct regulation to which primary insurers are subjected. The recoverability of the primary insurer's claims on its reinsurers may significantly affect the financial condition of the primary insurer. The primary insurer must therefore take steps the ensure that reinsurers are fit and proper contractual partners. in addition, potential "spirals" may compound the difficulty in evaluating risk reduction benefits.[19] Moreover, the nature of the reinsurance market makes it often difficult for protection buyers to know precisely who their ultimate reinsurer is (there was some evidence of this in the wake of the events of September 11, 2001). Insurance supervisors may need to consider the safety-and-soundness implications of the use of reinsurers by both insurance firms and other reinsurers. The IAIS is currently working on several issues related to reinsurance (see, for example, the IAIS paper on *Principles on Minimum Requirements for Supervision of Reinsurers*, October 2002).

Transparency

82. Operational risk transfer is not an area for which disclosure practices are well developed. Nevertheless, for the market to most effectively judge the ability of firms to manage their risks, it can be argued that firms could do more to disclose the extent to which they have transferred operational risk outside the firm. Supervisors should consider whether there is a need for new public disclosures in order that the marketplace may continue to be effective in enforcing discipline. Likewise, supervisors should carefully consider the extent to which disclosure of insurance and other forms of coverage could have any unintended consequences (e.g., by encouraging frivolous lawsuits).

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[19] A spiral effect may occur when reinsurers lay off some of their risk to other reinsurers, so exposures are transferred to other firms in the market rather than being dispersed outside the market. For example, consider a situation in which reinsurer A lays off part of its risk to reinsurer B, which in turn lays off part of its risk to reinsurer C, which in turn lays off part of its risk to reinsurer D, which lays off part of its risk to reinsurers A and B, and so on. This makes it difficult to determine where risks ultimately lay until the spiral of contracts is unwound.

Case Study: HIH Insurance

In March 2001, HIH Insurance, an insurer based in Australia with some international operations, became insolvent and went into provisional liquidation. The failure of HIH is considered to be one of the largest corporate failures ever in Australia. The scale of this insolvency has been considerable; HIH's liabilities were estimated to exceed its assets by somewhere between A$3.6 billion and A$5.3 billion. The failure came at considerable cost to consumers who purchased HIH products and to taxpayers who will ultimately have to pay the cost of a government-funded HIH Claims Support Scheme. Despite the existence of this Scheme, policyholders may not be paid for years, and may only be paid a fraction of their claims.

There were many factors that contributed to the failure of HIH.[20] The causes were not specifically operational risk-related, and the impact of HIH's failure was felt by buyers of protection against the full range of risks, not just those who purchased protection against operational risk. Still, the case is instructive for operational risk protection buyers, protection sellers, and supervisors. Among the contributors to the failure cited by the HIH Royal Commission were the following:

- Claims were well in excess of provisions (the shortfall was estimated at A$2.6-A$4.3 billion), with indications that HIH priced its products too aggressively and, in some cases, lacked the technical expertise to price its products effectively.
- HIH made a series of poor business decisions, particularly with regard to entering markets in the United States and United Kingdom. Losses were heavy in both instances. There is evidence that senior management either underestimated or deliberately understated the risk of its business decisions, and failed to exercise due diligence in acquisitions.
- The corporate culture discouraged questioning of management decisions. There were serious breakdowns in corporate governance in that the board of directors did not question or challenge senior management's decisions. This was compounded by weaknesses in identifying, managing, and reporting risks within the firm. Weak risk management systems failed to identify breaches of internal controls and limits.
- A number of accounting practices were considered to be aggressive or of questionable legality, which had the effect of masking the true financial condition of the firm.
- Reinsurance arrangements were used to manipulate financial statements and hide the true financial condition of the firm. These arrangements gave the appearance of risk transfer when, in reality, the firm retained the risk.
- External auditors and supervisors, while not to blame for the failure of HIH, nevertheless were slow to act with sufficient rigor in the face of evidence of the aforementioned problems.
- There are a number of lessons to be drawn from this case which are relevant in the context of this paper and which should be carefully considered by supervisors of both protection buyers and sellers. From the perspective of protection buyers, it is clear that policyholders were exposed to credit risk on

[20] This paper will not go into extensive detail on the causes of HIH's failure. For more information, readers are encouraged to review the findings of The HIH Royal Commission (http://www.hihroyalcom.gov.au/).

the part of HIH; many policyholders who thought they were insured against losses now find that they are liable for their losses. On a related note, the failure of HIH highlights the importance of concentration risk. Protection buyers with a heavy concentration of HIH policies were in a riskier position than those with diversified coverage. Finally, while there does not appear to be evidence that the failure of HIH resulted in a liquidity crunch, it is nevertheless apparent that, the time lag between claim and payment will be substantial (where payment is made at all).

From the perspective of protection sellers, it is apparent that HIH was not only unable to effectively assess and price for the risks it was taking on, but also under-provisioned for those risks. There were clear breakdowns in corporate governance, and in retrospect there were weaknesses in the ability of HIH's senior management and board of directors. In addition, reinsurance and intra-group transactions were used not to mitigate risk, but rather to mask the firm's true financial condition. This does not reflect a problem with the use of reinsurance, per se, but rather demonstrates that financial engineering in the guise of risk transfer may be a warning sign regarding a firm's financial condition that merits further exploration. Finally, a lack of transparency, which was exacerbated by questionable accounting practices, made it difficult for protection buyers and other interested parties to understand HIH's true financial condition.

Part 5: Conclusion

83. Supervisors should encourage the financial industry to continue its development of operational control mechanisms, including risk transfer. Both supervisors and firms need to understand better how effective particular mechanisms are in transferring risk, what new risks arise from the transfers, and the attendant systemic issues. Among other things, this would be helpful in monitoring firms' safety and soundness, understanding and addressing systemic issues, and calibrating capital requirements where appropriate.

84. As noted in the November 2001 Joint Forum paper, the key concern from a supervisory perspective is that the firms that are taking on risk (i.e., protection sellers) should have in place the necessary and adequate risk management and measurement systems to support these activities. For insurers acting as protection sellers, the operational risks accepted are transformed to insurance risks and are subject to all the risk management and measurement systems now in use in that context. Moreover, as operational risk transfer across sectors increases, it is incumbent upon supervisors to share information across sectors to most effectively keep pace with the level of risk transfer and to monitor the risk to the financial system and to specific firms.

85. The current market for various types of operational risk transfer is not a mature market. While there are longstanding insurance markets for many specific elements of operational risk (e.g., theft, property losses resulting from external events such as fires, etc.), this is primarily piecemeal.

86. There are a number of reasons why, for various types of operational risk transfer, market practices are still in the early stages of development. For one thing, whilst financial firms have long managed the various elements that comprise operational risk, the comprehensive discipline of operational risk management is still evolving. For example, work on the definition of the components of operational risk is still ongoing. The banking industry has begun only recently to settle around a consistent definition as set forth in proposed revisions to the Basel Capital Accord. Even if the definition set forth in the revised Basel Accord were to be universally adopted across the banking sector, it is very broad and

encompasses a wide range of loss event types as summarised in Annex 3. Each of these event types, in turn, lacks consistent industry definitions. In the absence of consistent definitions and clarity about transferable risks, legal uncertainty and disagreements about the scope of coverage will continue to pose significant challenges for the development of operational risk transfer mechanisms. This argues for the continuing development of piecemeal coverage of specific perils rather than less well-defined and harder-to-quantify "basket" coverage.

87. Operational risk is undeniably difficult to assess. In particular, it is difficult to assess a firm's operational risk profile, which depends in part on its loss history, internal control environment, and various forward-looking factors. Firms are just now developing comprehensive internal loss event data, and it is difficult for an unaffiliated third party to assess the quality of a firm's internal controls. Consequently, in the absence of sufficient comprehensive information, the only way most counterparties with an interest in long-term viability would be willing to assume a firm's broad basket coverage for operational risk would be at a steep price to compensate for uncertainty. This is an impediment to the development of tradable instruments that could serve to transfer operational risk.

88. Significant underwriting losses and weakened investment returns over the past couple of years have resulted in a "hard market" in which even many traditional insurance products attract higher premiums. In the current market, there is little appetite in the insurance industry to develop innovative new products to more broadly cover operational risks, and any products would likely be prohibitively expensive for protection buyers. Because the insurance market is cyclical, however, when the current hard market ends insurers may attempt to develop innovative new products—either insurance or alternative risk transfer instruments—to facilitate operational risk transfer.

89. Supervisors should neither encourage nor discourage such efforts, but should keep apprised of developments in this area. If there is sufficient demand for a more effective market for operational risk transfer, then new instruments and products will likely be developed. Supervisors should monitor the use of new products—particularly if the use of such products allows a reduction in required capital—to ensure that firms have a clear understanding not only of the operational risks transferred, but also the risks (e.g., legal risk) of using new instruments. To the extent that supervisory initiatives (e.g., the new Basel Accord) offer incentives for greater risk transfer, supervisors should be aware of these incentives and should strive to ensure that these incentives drive safe and sound behaviour on the part of regulated firms.

90. Finally, supervisors need to maintain their vigilance with respect to the systemic implications of low-frequency, high-severity catastrophic operational loss events for which risk transfer may not be cost-effective for firms. Insurers have typically not provided coverage—or have only done so at commensurate prices—for loss events that are not independent of each other, or that are extremely rare and therefore difficult to quantify (e.g., wars and floods). The events of 11 September 2001 demonstrated that the insurance industry was strong enough to bear significant losses even if, in the aftermath of these events, most insurers either stopped writing coverage for terrorism or increased the premiums for such coverage or reduced the amount of coverage for new contracts.

Annex 1

Firm Interviews

In drafting this paper, firms in multiple jurisdictions were interviewed[21]. Each firm selected was active in at least two of the three financial sectors. While we have agreed to keep confidential the names of the firms, the number of firms from specific countries are listed below:

Country	Number of Firms Interviewed
Belgium	1
Canada	1
France	2
Germany	1
Italy	1
Japan	1
Netherlands	1
Spain	3
Sweden	1
Switzerland	1
United Kingdom	1
United States	9
Total	23

[21] A separate set of interviews was conducted with firms in the preparation of the Joint Forum report on Trends in Risk Integration and Aggregation. While there was significant overlap across the two sets of interviews, not all firms participated in both sets of interviews.

Annex 2

United States Capital Charges and Rules Relevant to the Management of Operations Risk at U.S.-registered Securities Firms

The United States Securities and Exchange Act of 1934 (the "Exchange Act"), the Financial Responsibility Rules thereunder, the Federal Reserve Board of Governor's Margin Rules, and rules of broker-dealer self-regulatory organisations ("SROs") all contain components that, when combined, provide a baseline framework for broker-dealers to manage operations risks. These regulations generally require that each broker-dealer create and maintain current books and records, take capital charges to the extent that balances are not reconciled and securities are not received or delivered in a timely manner, close-out transactions if a customer fails to pay or deliver securities promptly, and create and maintain supervisory procedures and processes designed to assure compliance with applicable securities requirements.

The Exchange Act

The Exchange Act provides that a broker-dealer must create and maintain records, furnish copies thereof, and make and disseminate such reports as the Securities and Exchange Commission (the "Commission") prescribes.[22] In addition, the Exchange Act provides that a broker-dealer must comply with financial responsibility rules prescribed by the Commission.[23] Finally, section 7 of the Exchange Act, regarding margin requirements, states that the Board of Governors of the Federal Reserve Board shall prescribe rules and regulations with respect to margin.[24] The maintenance of timely, accurate, and complete books and records is integral to the management of operations risk. Timely reconcilement of the broker-dealer's financial records (for instance, reconcilement of bank statements, DTC stock records, fails to deliver with a counterparty, or customer margin account balances) assures that the broker-dealer resolves discrepancies while information is fresh and readily available.

A broker-dealer should reasonably supervise its activities and employees by establishing procedures, and a system for applying such procedures, which would reasonably be expected to prevent and detect violations of securities laws, regulations and rules.[25] Exchange Act Rule 17a-4(b) presently requires that written policies and procedures be maintained for three years, and new paragraph 17a-4(e)(7), which became effective on May 3, 2003, requires that written policies and procedures be maintained until three years after the termination of use of the manual.

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[22] 15 U.S.C. 78q(a)(1).

[23] 15 U.S.C. 78o(c)(3).

[24] 15 U.S.C. 78g(a).

[25] See generally 15 U.S.C. 78o(b)(4)(E).

The Financial Responsibility Rules

The Financial Responsibility Rules include the Net Capital Rule,[26] the Hypothecation Rules,[27] the Free-Credit Balance Rule,[28] the Customer Protection Rule,[29] the Books and Records Rules,[30] the Reporting Rules,[31] the Risk Assessment Rules,[32] the Early Warning Rule,[33] and the Quarterly Count Rule.[34] These Financial Responsibility Rules require that broker-dealers address operations risk by requiring that a broker-dealer: 1) maintain certain, specified books and records; 2) count, at least once each quarter, all securities positions it has and should have and reconcile any differences in a timely manner; 3) take a charge to capital if it fails to collect certain receivables in a timely manner; 4) maintain additional customer reserves if it fails to obtain securities to cover customer transactions (e.g., customer fails to receive), obtain dividends or stock splits, reconcile short security count differences, reconcile suspense accounts, or transfer securities in a timely manner; and 5) have an independent accountant audit the firm's financial statements and operations at least once annually.

Books and Records Rules

The Books and Records Rules require that a broker-dealer maintain certain, specified books and records, including: 1) blotters containing an itemised daily record of all purchases, sales, receipts, and deliveries of securities, all receipts and disbursements of cash and all other debits and credits;[35] 2) ledgers reflecting all assets, liabilities, income, expenses, and capital accounts;[36] 3) separate ledger accounts for each customer cash and margin account itemising all purchases, sales, receipts and deliveries of securities and commodities, and all other debits and credits;[37] 4) a securities record or ledger reflecting separately for each securities as of the settlement date, all positions carried by the broker-dealer, to which accounts they belong and where they are held;[38] 5) order tickets;[39] 6) customer account information;[40] 7) employee records;[41] 8) cheque books, bank statements, cancelled checks, and cash reconciliations;[42] 9) communications received or sent by the broker-dealer relating to its business;[43] and 10) all written agreements entered into by the broker-dealer.[44] Broker-

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[26] 17 CFR 240.15c3-1.

[27] 17 CFR 240.8c-1 and 240.15c2-1.

[28] 17 CFR 240.15c3-2.

[29] 17 CFR 240.15c3-3.

[30] 17 CFR 240.17a-3, 240.17a-4, 240.17a-7 and 240.17a-8.

[31] 17 CFR 240.17a-5, 240.17a-10 and 240.17a-12.

[32] 17 CFR 240.17h-1T and 240.17h-2T.

[33] 17 CFR 240.17a-11.

[34] 17 CFR 240.17a-13.

[35] 17 CFR 240.17a-3(a)(1).

[36] 17 CFR 240.17a-3(a)(2).

[37] 17 CFR 240.17a-3(a)(3).

[38] 17 CFR 240.17a-3(a)(5).

[39] 17 CFR 240.17a-3(a)(6) and (7).

[40] 17 CFR 240.17a-3(a)(9) and new paragraph (17).

[41] 17 CFR 240.17a-3(a)(12) and new paragraph (19).

[42] 17 CFR 240.17a-4(b)(2).

[43] 17 CFR 240.17a-4(b)(4).

dealers need these records to maintain control of their internal processes and systems. Because the maintenance of these books and records is seen to be so important to a broker-dealer's ability to operate, the Early Warning Rule requires that if a broker-dealer fails to make and keep current the books and records required pursuant to the Books and Records Rules, it must immediately notify the Commission (and its designated examining authority). Further, the broker-dealer must subsequently (within 48 hours) provide the Commission (and its designated examining authority) with a report stating what the broker-dealer is doing to rectify the situation.[45]

Net Capital Rule

The Net Capital Rule requires that a broker-dealer take a charge to capital if it fails to collect certain receivables in a timely manner. More specifically, a broker-dealer must deduct from its net capital "assets not readily convertible into cash."[46] Among these assets are: 1) receivables arising out of free shipments of securities outstanding more than 7 business days and mutual fund redemptions outstanding more than 16 business days;[47] 2) interest receivable, floor brokerage receivables, commissions receivable from other broker-dealers mutual fund concessions receivable and management fees receivable from registered investment companies outstanding more than 30 days from the date they arise, dividends receivable outstanding longer than 30 days from the payable date;[48] 3) Insurance claims which, after 7 business days from the date the loss giving rise to the claim is discovered, are not covered by an opinion of outside counsel that the claim is valid and is covered by insurance policies presently in effect;[49] and 4) all other unsecured receivables, all assets doubtful of collection less any reserves established therefore, the amount by which the market value of securities failed to receive outstanding longer than 30 calendar days exceeds the contract value of such fails to receive.[50] Finally, a broker-dealer must take a charge to net capital to the extent that it has fails to deliver outstanding five business days or longer.[51] These rules are intended to encourage broker-dealers to collect and/or settle these receivables within the specified time periods so that they will not be required to take the capital charge. Although these charges may appear to address credit risk (encouraging collection of outstanding receivables), they also address operations risk by causing the broker-dealer to track aging, outstanding receivables. In addition, collecting these receivables as quickly as possible reduces systemic risk and therefore operations risk.

Customer Protection Rule

The Customer Protection Rule requires that a broker-dealer maintain additional customer reserves if it fails to obtain securities to cover customer transactions (e.g., customer fails to receive), obtain dividends or stock splits, reconcile short security count differences, reconcile suspense accounts, or transfer securities in a timely manner. The reserve requirements

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[44] 17 CFR 240.17a-4(b)(7).

[45] 17 CFR 240.17a-11(d).

[46] 17 CFR 240.15c3-1(c)(2)(iv).

[47] 17 CFR 240.15c3-1(c)(2)(iv)(B).

[48] 17 CFR 240.15c3-1(c)(2)(iv)(C).

[49] 17 CFR 240.15c3-1(c)(2)(iv)(D).

[50] 17 CFR 240.15c3-1(c)(2)(iv)(E).

[51] 17 CFR 240.15c3-1(c)(2)(ix).

generally require a broker-dealer that holds customer funds and securities to maintain a special reserve account for the exclusive benefit of customers,[52] and assure that sufficient monies are in that account by using a set formula to calculate the required reserves.[53] Generally, the calculation requires a broker-dealer to add monies it owes to customers (called "customer credits"), and subtract from those customer credits the amount its customers owe to it (called "customer debits").[54] Included as credits in the formula are: 1) customers' securities failed to receive outstanding more than 30 calendar days;[55] 2) the market value of stock dividends, stock splits, and similar distributions receivable outstanding over 30 calendar days;[56] 3) the market value of short security count differences over 30 calendar days old;[57] 4) the market value of short securities and credits in suspense accounts over 30 calendar days;[58] and 5) the market value of securities in transfer in excess of 40 calendar days that have not been confirmed to be in transfer by the transfer agent or the issuer.[59] These requirements are intended to encourage broker-dealers to collect and/or settle these items within the specified time periods so that they will not be required to reserve for those amounts. Requiring broker-dealers to reserve for these items causes them to track the items better. In addition, collecting or settling these items as quickly as possible reduces systemic risk and therefore operations risk.

Margin Rules

The United States' Margin Rules[60] provide certain constraints upon leverage in the financial markets, however they have certain operations risk components as well. Regulation T regulates the extension of credit on securities by broker-dealers.[61] Regulation T requires that a broker-dealer: 1) maintain records of each account;[62] 2) separate cash and margin accounts for customers;[63] and 3) either obtain prompt payment or prompt delivery of a security from a customer or close out that customer's position.[64] These rules require that a broker-dealer have systems in place to track transactions and receipts of monies and securities, and to close out aged positions.

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[52] 17 CFR 240.15c3-3(e).

[53] *Id*.

[54] 17 CFR 240.15c3-3a.

[55] 17 CFR 240.15c3-3a, Item 4 and Note D.

[56] 17 CFR 240.15c3-3a, Item 6.

[57] 17 CFR 240.15c3-3a, Item 7.

[58] 17 CFR 240.15c3-3a, Item 8.

[59] 17 CFR 240.15c3-3a, Item 9.

[60] 12 CFR 220 (commonly called "Regulation T"), 12 CFR 221 (commonly called "Regulation U"), and 12 CFR 224 (commonly called "Regulation X").

[61] 12 CFR 220.1(a).

[62] 12 CFR 220.3(a).

[63] 12 CFR 220.3(b).

[64] 12 CFR 220.4(c) and 220.8(b).

In addition, the self-regulatory organisations have instituted maintenance margin rules that further restrict extensions of credit by broker-dealers.[65] For instance, NYSE Rule 432 requires that broker-dealers maintain a daily record of required margin.

These margin requirements also have Net Capital Rule ramifications because the Net Capital Rule includes a provision that requires that a broker-dealer take a capital charge to the extent that any accounts do not satisfy the SRO maintenance margin requirements.[66] These SRO maintenance margin requirements generally provide that a broker-dealer must not lend more than 75% of the value of the underlying, margin-eligible equity securities.

Self-regulatory Organisation Rules

Self-regulatory organisation rules provide an additional layer of regulations that require broker-dealers to have certain internal controls to address operations risk. For example, NYSE Rule 345 and NASD Rules 1020 and 1030 require that a broker-dealer's associated persons meet certain qualification standards and that they be registered. As part of the registration process, the associated person must file a Form U-4 on which the associated person must disclose, among other things, his or her educational background, employment experience, and whether he or she has been convicted of a crime. The associated person may also be required to take certain examinations before being allowed to perform certain functions for the broker-dealer. Another example is NASD rule 3010, which requires that a broker-dealer: 1) establish and maintain a supervisory system reasonably designed to achieve compliance with applicable securities laws and regulations; 2) establish, maintain and enforce written procedures to supervise the types of business in which the firm engages; and 3) conduct internal inspections, at least annually, of the businesses in which it engages.

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[65] *See e.g.*, NYSE Rule 431 and NASD Rule 2520.

[66] 17 CFR 240.15c3-1(c)(2)(xii).

Annex 3

Detailed Loss Event Type Classification

Event-Type Category (Level 1)	Definition	Categories (Level 2)	Activity Examples (Level 3)
Internal fraud	Losses due to acts of a type intended to defraud, misappropriate property or circumvent regulations, the law or company policy, excluding diversity/ discrimination events, which involves at least one internal party.	Unauthorised Activity	Transactions not reported (intentional) Trans type unauthorised (w/monetary loss) Mismarking of position (intentional)
		Theft and Fraud	Fraud / credit fraud / worthless deposits Theft / extortion / embezzlement / robbery Misappropriation of assets Malicious destruction of assets Forgery Check kiting Smuggling Account take-over / impersonation / etc. Tax non-compliance / evasion (wilful) Bribes / kickbacks Insider trading (not on firm's account)
External fraud	Losses due to acts of a type intended to defraud, misappropriate property or circumvent the law, by a third party	Theft and Fraud	Theft/Robbery Forgery Check kiting
		Systems Security	Hacking damage Theft of information (w/monetary loss)
Employment Practices and Workplace Safety	Losses arising from acts inconsistent with employment, health or safety laws or agreements, from payment of personal injury claims, or from diversity / discrimination events	Employee Relations	Compensation, benefit, termination issues Organised labour activity
		Safe Environment	General liability (slip and fall, etc.) Employee health & safety rules events Workers compensation
		Diversity & Discrimination	All discrimination types

Event-Type Category (Level 1)	Definition	Categories (Level 2)	Activity Examples (Level 3)
Clients, Products & Business Practices	Losses arising from an unintentional or negligent failure to meet a professional obligation to specific clients (including fiduciary and suitability requirements), or from the nature or design of a product.	Suitability, Disclosure & Fiduciary	Fiduciary breaches / guideline violations Suitability / disclosure issues (KYC, etc.) Retail consumer disclosure violations Breach of privacy Aggressive sales Account churning Misuse of confidential information Lender Liability
		Improper Business or Market Practices	Antitrust Improper trade / market practices Market manipulation Insider trading (on firm's account) Unlicensed activity Money laundering
		Product Flaws	Product defects (unauthorised, etc.) Model errors
		Selection, Sponsorship & Exposure	Failure to investigate client per guidelines Exceeding client exposure limits
		Advisory Activities	Disputes over performance of advisory activities
Damage to Physical Assets	Losses arising from loss or damage to physical assets from natural disaster or other events.	Disasters and other events	Natural disaster losses Human losses from external sources (terrorism, vandalism)
Business disruption and system failures	Losses arising from disruption of business or system failures	Systems	Hardware Software Telecommunications Utility outage / disruptions

Event-Type Category (Level 1)	Definition	Categories (Level 2)	Activity Examples (Level 3)
Execution, Delivery & Process Management	Losses from failed transaction processing or process management, from relations with trade counterparties and vendors	Transaction Capture, Execution & Maintenance	Miscommunication Data entry, maintenance or loading error Missed deadline or responsibility Model / system misoperation Accounting error / entity attribution error Other task misperformance Delivery failure Collateral management failure Reference Data Maintenance
		Monitoring and Reporting	Failed mandatory reporting obligation Inaccurate external report (loss incurred)
		Customer Intake and Documentation	Client permissions / disclaimers missing Legal documents missing / incomplete
		Customer / Client Account Management	Unapproved access given to accounts Incorrect client records (loss incurred) Negligent loss or damage of client assets
		Trade Counterparties	Non-client counterparty misperformance Misc. non-client counterparty disputes
		Vendors & Suppliers	Outsourcing Vendor disputes

Annex 4

Insurable Risks in Property and Casualty Insurance

As noted in Part 2, there are several characteristics of insurable property and casualty risks. These characteristics are described in greater detail here.

1. Law of large numbers

The law of large numbers (LLN) is the name given to a principle which states that a large number of similar, but uncorrelated risks will experience results more closely clustered around the mean, or expected value, than will a smaller number of such risks. This effect is desirable in an insurance activity, as it results in a more efficient use of capital than is the case with self-insurance. This is because the potential for volatility in actual losses is reduced, which requires the insurer to hold less capital. This is described more fully below.

There are two supporting conditions which must be met to satisfy the LLN. First, the occurrence of the specified event for one insured should not affect the probability of the occurrence of the event for another insured (i.e., the occurrence of the specified event for different insureds in the block should not be correlated). Second, a large number of insureds with a similar risk profile must be covered. These two requirements can be met by issuing a sufficient number of policies to similar, but non-related insureds.

The beneficial effect of the LLN is a reduction of the amount of capital required to meet unexpected losses. This is better understood by examining the elements of the cost to insure a block of policies. Over their lifetime, for a block of policies, premiums plus investment income should equal the sum of (a) expected losses; (b) return on capital held to cover unexpected losses; and (c) expenses and taxes.

When the block of policies satisfies the supporting requirements and the beneficial effect of the LLN is present, only item (b) is affected. That is, items (a) and (c) would generally increase on a pro rata basis as the number of policies increases (ignoring varying marginal rates for expenses and taxes). However, item (b) would increase on a less than pro rata basis, because a block of policies benefiting from the LLN will have, on a per policy basis, a smaller level of unexpected losses than will a smaller block (or a single policy). This is because when there are many, independent risks, then for some policies the actual losses will exceed the expected while for others, actual losses will be less than expected, producing offsets. This reduces the total unexpected losses and, thus, the amount of capital required to cover these losses. As a result, if a single policyholder were to self-insure, the amount of capital required to provide a stated level of assurance (e.g., a 99% confidence level) that the loss would be covered would be much larger than the per policy portion of the capital required to provide the same level of security for a block of many independent policyholders. This is a major advantage of insurance (i.e., risk pooling) over self-insurance.

2. Unanticipated loss to the insured.

The occurrence of the specified contingent (fortuitous or accidental) event should cause an unanticipated loss to the insured. There is no purpose for insurance for contingent events

that do not cause a loss, nor for those events and related losses that are anticipated. If the contingent event cannot cause a loss, then the arrangement is just a wager on the occurrence of the specified event. Similarly, if the event and loss are anticipated, then it is an expense that should be budgeted, and is not a proper subject for insurance.

This requirement directly leads to two corollaries:

- The contingent event should either be outside the control of the insured or be undesirable to the insured (or both). If the event was within the control of the insured and was desirable, then a loss would be more likely (i.e., in the nature of an expected expense
- Insurance benefits should be limited to no more than the amount of the loss; otherwise, the insured is receiving a portion of the payment for losses not sustained.

3. Objectively determinable and verifiable.

If the loss and its cause cannot be clearly established, then claims cannot be objectively adjudicated and consistently administered. In this context, pricing and reserving cannot be confidently performed. If these major insurance activities cannot be performed with confidence, insurance cannot be successfully provided.

Annex 5

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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

Belgium	Mr Jos Meuleman	Commission Bancaire et Financière
Canada	Mr Denis Sicotte	Office of the Superintendant of Financial Institutions
France	Ms Nadege Jassaud	Commission Bancaire
	Mr Roland Moquet	Ministère de l'Economie, des Finances et de l'Industrie
Germany	Mr Reinhard Köning	Bundesanstalt für Finanzdienstleistungsaufsicht
Italy	Ms Laura Pinzani	Banca d'Italia
Japan	Mr Yasuhiro Fujie	The Bank of Japan
	Mr Toru Sakane	Financial Services Authority
Netherlands	Mr Klaas Knot	Pensioen en Verzekeringskamer
Singapore	Ms Soo Hoon Hauw	Monetary Authority of Singapore
Spain	Ms Marta Estavillo	Banco de España
	Ms Maribel Herrero	Comisión Nacional del Mercado de Valores
Sweden	Mr Mats Stenhammar	Finansinspektionen
Switzerland	Mr Roland Goetschmann	Eidgnoessischen Bankenkommission
United Kingdom	Ms Nadege Genetay	Financial Services Authority
United States	Ms Anna Lee Hewko	Board of Governors of the Federal Reserve System
	Mr T Kirk Odegard	Board of Governors of the Federal Reserve System
	Ms Elise Liebers	Federal Reserve Bank of New York
	Mr Richard Mead	Federal Reserve Bank of New York
	Mr Ernest L Johnson, III	Virginia Bureau of Insurance
	Mr Michael Macchiaroli	Securities and Exchange Commission
	Mr George Lavdas Mr Michael Yuenger	Office of the Comptroller of the Currency
IAIS	Mr Yoshihiro Kawai Mrs Catherine Lezon	
EU Commission	Mr Peter Smith	
Secretariat	Mr Laurent Le Mouël	Secretariat of the Basel Committee on Banking Supervision