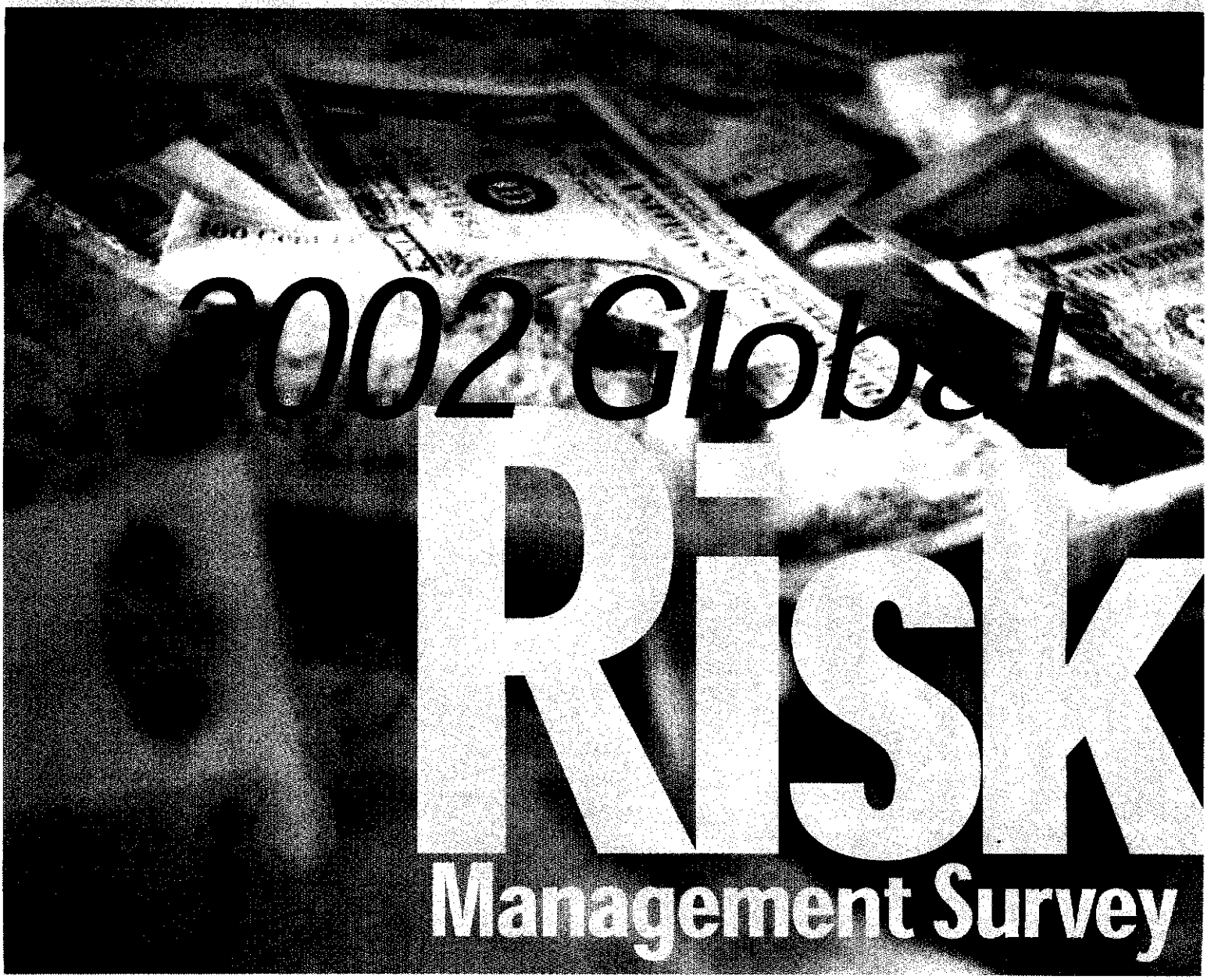
Deloitte
Touche
Tohmatsu



2002 Global RISK Management Survey

Serving the Financial Services Industry Globally

These survey results are based solely upon the information provided by the participating companies' representatives. Deloitte Touche Tohmatsu has made no attempt to verify the reliability of such information. These survey results are limited in nature, and do not comprehend all matters relating to risk management that might be pertinent to your business. We make no representation as to the sufficiency of these survey results for your purposes. These survey results should not be viewed as a substitute for other forms of analysis that management should undertake and is not intended to constitute legal, accounting, tax, investment, consulting, or other professional advice or services. Before making any decision or taking any action that might affect your business, you should consult a qualified professional advisor. Your use of these survey results and information contained herein is at your own risk. Deloitte Touche Tohmatsu will not be liable for any direct, indirect, incidental, consequential, punitive damages or other damages, whether in an action of contract, statute, tort (including, without limitation, negligence) or otherwise, relating to the use of these survey results or information contained herein. These survey results and the information contained herein are provided "as is," and Deloitte Touche Tohmatsu makes no express or implied representations or warranties regarding the results or the information. These survey results are solely for your informational purposes and internal use and you will not disclose it to any other person or entity. For more information, please contact your Deloitte Touche Tohmatsu professional.

Table of Contents


Risk
Management Journal

Executive Summary

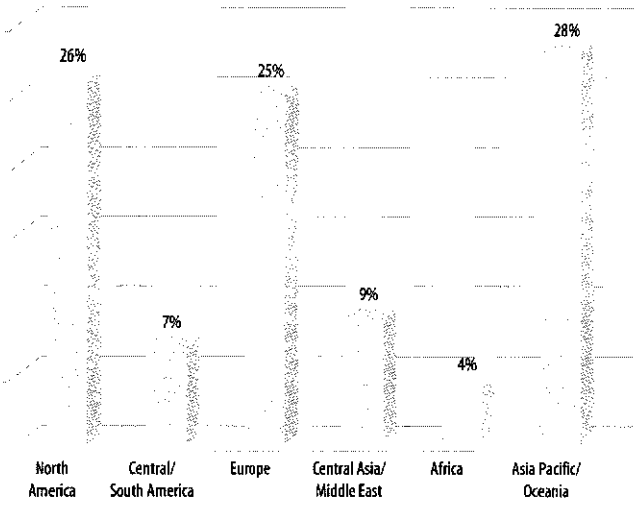
A great deal has happened since we conducted our last Global Risk Management Survey in 1999:

- » Many financial firms experienced mergers and acquisitions that raised concerns about integrating risk management systems and processes.
- » Regulators have continued to influence risk management trends, most notably through the Bank for International Settlements ("BIS"), which has issued a proposed New Accord ("Basel II") to replace the 1988 Capital Accord. With the New Accord, BIS updated credit risk measurement approaches and introduced new methodologies for measuring operational risk and related capital charges.
- » Risk management system vendors have saturated the market with new and advanced applications that incorporate new methodologies and more integrated capabilities to capture a wider product base.
- » Worldwide, the tragic events of September 11 have emphasized risk of business interruption due to terrorism and war.
- » In the U.S., the dramatic collapse of Enron has resulted in a very public debate about the role of corporate governance, board oversight and off-balance sheet risks in all entities including financial firms.

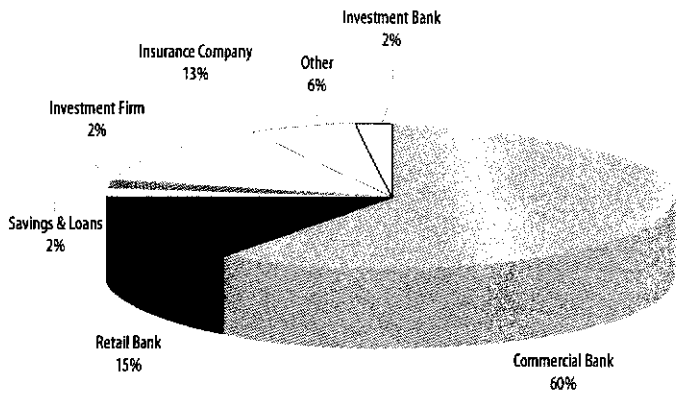
In the meantime, a number of surveys have been conducted by risk magazines, system vendors and industry groups that were limited in scope either to specific areas within risk management or types of financial institutions. These surveys do not offer a view of global risk management practices among a cross section of financial services institutions. Therefore, we conducted our survey addressing risk management on a global basis among the following disciplines:

1. Risk Governance
2. Capital Allocation
3. Enterprise Risk Management
4. Credit Risk Management
5. Market Risk Management
6. Operational Risk Management
7. Business Continuity Management
8. Risk Systems and Technology Infrastructure

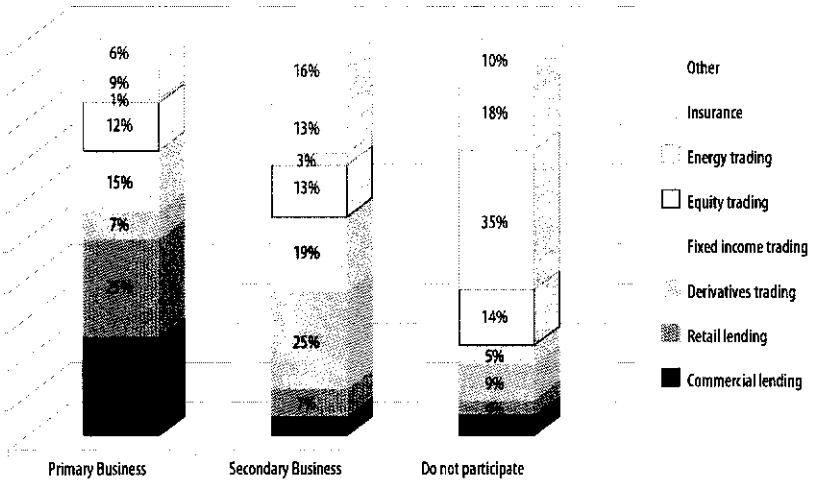
Regional Representation



Company's Primary Line of Business



Primary Business Activities



Our 2002 risk survey participant data reflects current trends in risk management throughout major global financial institutions. Participants represented major financial institutions with offices in six major market regions. The final survey sample reflects all major financial services sectors. The two sectors with the most participants were banking and insurance. While commercial banks made up 60% of the total population, half considered either commercial or retail lending as a primary business activity in terms of active market participation.

Our goal in conducting this survey is to identify and share current practices and future trends in risk measurement methodologies, management approaches and risk systems infrastructure. In this report, we present the results of our survey and highlight significant trends in risk management. We believe that our findings will provide a useful benchmarking tool for the participants and the larger risk management community within financial institutions.

Following is an overview of key observations for each of the disciplines covered in the survey.

Traditionally different forms of risks (credit, market, operational, etc.) were compartmentalized and risk professionals assigned the responsibility to manage these risks in isolation. Risks were divided by their source, or by location or region. More recently, there has been a trend towards the integration of the risk management function. Our survey confirms this trend.

To bring all risks (market, credit, operational, etc.) under one area of responsibility, almost two-thirds (65%) of survey participants have moved or are progressing towards the appointment of a Chief Risk Officer ("CRO"), who often reports primarily to the Board of Directors.

The single most important responsibility of the risk oversight function, as highlighted by the respondents to the survey, is to conduct risk analyses and provide management with risk reporting. Developing policies and control procedures and monitoring compliance was considered the next highest priority of this function.

Not surprisingly, institutions worldwide continue to progressively adopt more sophisticated approaches towards capital allocation. The New Basel Accord proposals have clearly contributed to this trend by emphasizing the need for greater risk sensitivity in capital measures. However, significant challenges relating to data and systems infrastructure are expected to make the task of compliance with advanced approaches difficult. It is encouraging to note that, in spite of the burdensome and potentially costly mandates, an overwhelming majority of the surveyed institutions now view the New Accord as having a positive influence on the state of risk management, especially with respect to credit risk.

The trend towards improved granularity and deeper application of economic capital within the surveyed institutions continues, albeit at a slower pace. It will be interesting to observe if the role and importance of economic capital modeling is compromised or diluted over the coming years with increased risk sensitivity in regulatory capital measures. Based on the current state of risk management and migration plans for the future, a convergence between these measures, especially at small and mid-sized institutions, is a distinct possibility.

ERM is an area that draws a lot of attention from risk managers, senior management and shareholders. Very few institutions indicated that they have already achieved a fully integrated view of market, credit and operational risks within their organizations. However, over half of the participants consider this integration to be a high priority. The responses clearly point towards risk-adjusted performance measurement and shareholder value management as the key drivers of evolution towards an ERM framework. Participants viewed effective integration of the enterprise databases and related risk systems as their biggest challenge. Only about half of the participants considered their risk data and systems to be somewhat integrated, while nearly 40% viewed them to be "not integrated at all."

Credit Risk Management

Despite the recent recession and poor performance of the credit markets, majority of survey participants indicated that they do not intend to tighten underwriting standards. Possible explanations may include that many institutions adjusted their standards early in the cycle, the availability of better credit risk management tools, or that many organizations are well capitalized and hence can take advantage of the current relatively rich credit spreads. Indeed, one of the most quoted tools to tighten standards is pricing. This response may also be an indication of the growing acceptance and implementation of a risk/return-based pricing philosophy and a better understanding of advanced risk analytics.

Approximately half of the respondents reported their internal risk ratings perform satisfactorily based on periodic effective testing and benchmarking. In addition, counterparty exposure measurement and portfolio management analytics have advanced beyond the rudimentary (i.e., principal plus add-on and concentration analysis, respectively). Over the near-term, portfolio level credit risk mitigation tools such as securitization, credit derivatives and macro hedges are expected to gain additional ground, further contributing towards trends in 'active' portfolio management.

However, significant challenges remain; systems issues were identified as the key reason for the lack of timely credit risk analyses and reporting. Moreover, a substantial minority has not yet embraced some of these new methods and advanced approaches.

Market Risk Management

Most of the market value-at-risk analysis and related system implementations were initially completed in the mid-to-late 1990s. However, we observed that many participants still allocate resources to improve their existing capabilities and integrate various forms of analytical techniques. For example, many participants attach a high priority to incorporating stress testing, event risk, and liquidity risk into their Value-at-Risk (VaR) framework.

Scenario-based stress testing still appears to be a popular form of market risk analysis. A large majority of participants uses it to understand the firm's risk profile, report to senior management, and set market risk limits.

Simulation-based Asset Liability Management (ALM) analyses are currently used by approximately 40% of the participants and roughly a third plan to implement this approach within the next two years. As a result, we expect to see further migration from traditional ALM metrics such as Gap Analysis towards simulation-based measures such as NII-at-Risk and NEV-at-Risk.

Operational Risk Management

Despite the recent regulatory and industry attention on operational risk management, the majority of survey participants indicated they are only in the preliminary phases of operational risk framework development. However, a strong minority indicated their organizations are already in the final phase (managing operational risk). The overwhelming driver for operational risk framework implementations has been regulatory activity, although nearly a third of respondents envision gaining a competitive edge.

Currently, the most common operational risk management structure used by respondents involves an independent operational risk control and audit function with active involvement by the board and senior management. Nearly a quarter of the respondents did not have a centralized operational risk management structure; rather, operational risk management is a function of the business units without independent oversight. One would expect this decentralized, unmonitored approach to decrease in popularity as organizations move into the latter stages of operational risk management implementation and as more organizations try to incorporate operational risk management into corporate strategy.

Given the limited time frame that focus has been placed on operational risk management, a minority of survey participants rated their operational risk management as being very capable. Loss event data is somewhat, but not extensively, used, either implying that data is unavailable or is not robust enough to use as a primary tool. The most heavily planned approach in the next two years is the use of risk indicators. Clearly, there is a recognized need to enhance systems and technology significantly.

Business Continuity Management

The events that occurred on September 11, 2001 were a reminder for many companies about the risks of business continuity. Because of this, many companies reviewed and refined their Business Continuity Plans ("BCP"). Geographic diversity, employee safety procedures, and system-data backup facilities are among the popular topics addressed by many participants' BCPs. We observed that cost of business interruption still appears to be a big unknown for many institutions; however, most participants have a target recovery time from large-scale business interruptions.

Risk Systems and Technology Infrastructure

IT projects pertaining to credit MIS and enterprise-wide data warehouse implementations currently appear to be pervasive among the participants, with over 50% of budgetary resources allocated to these two categories. For a majority of participants, lack of integration across disparate platforms continues to be a major concern with respect to the existing infrastructure in addition to timely reporting limitations. Not surprisingly, the three highest-ranking priority criteria in the selection/implementation of new risk systems are flexibility, cost and ability to integrate.

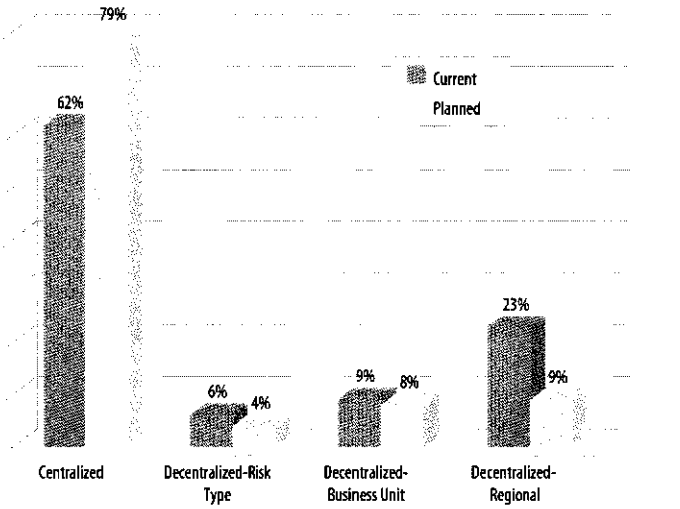
1 Risk Governance

Risk taking is an integral part of a financial services institution's business activities. Although the responsibility and accountability for managing risk oftentimes remain with the businesses, many firms have established formal risk governance structures consisting of risk committees, groups, functions and officers with various responsibilities.

We have seen a trend towards the modern risk manager playing a strategic role in an institution's decision-making hierarchy, where alternatives are considered by balancing the risk/reward trade-offs. Many institutions are seeing the benefit of a central risk function, where a Chief Risk Officer ("CRO") or equivalent works closely with the senior leadership team to improve business processes and enhance the decision-making process.

The respondents to our survey have confirmed this trend. The majority (62%) indicated that they currently have a centralized risk management function. In addition, a significant portion of the respondents using a decentralized approach is planning to move to a centralized approach. Among those that continue with a decentralized approach to risk management, responsibilities are primarily distributed on a regional, geographic basis. As more financial institutions develop more integrated risk systems, the trend towards centralization of risk management in financial institutions should continue.

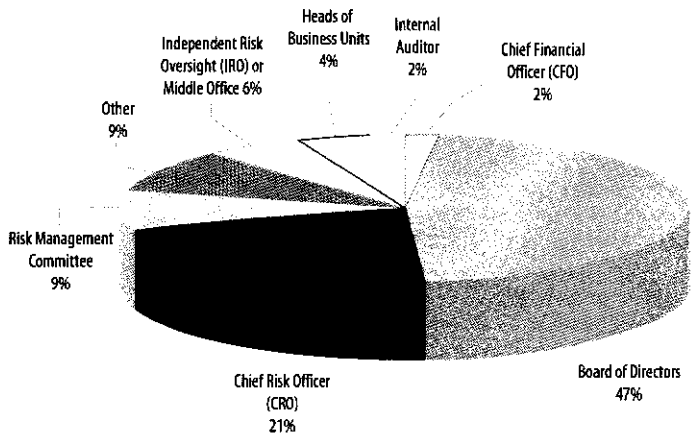
Centralized versus Decentralized Risk Management Function



In most financial institutions (53%), the Board of Directors executes its risk oversight function through delegated authority to a CRO, senior officer or a risk committee. Less than half (47%) of the respondents indicated that the Board of Directors has ultimate responsibility for the management and control of risks. Approximately one fifth (21%) identified the CRO as having overall responsibility for risk management oversight.

With day-to-day risk management playing an increasingly important role in the eyes of shareholders and regulators, many financial institutions have appointed a CRO to oversee the execution of the risk management strategies and policies. However, not all organizations have felt the need to appoint a CRO – more than one third (35%) of our respondents reported they do not have one. Among those that have a CRO, approximately a third (32%) indicated that the CRO reports to the Board of Directors. Another third (32%) said that the function reports to the CEO. The remaining third of the respondents noted that the CRO reports to various committees.

Overall Responsibility for Risk Management



As competition for business leads financial service institutions to seek new avenues to generate revenues (with new risk profiles), the importance of having an independent risk oversight function has increased. While the level of independence in the risk oversight function has increased relative to a few years ago, some institutions (27%) still do not have an independent risk function.

The responsibilities of a risk oversight function sometimes overlap with the responsibilities of other functions (such as internal audit and compliance) in the organization. A majority of those with an independent risk oversight function have identified the following as primary responsibilities of the "Independent Risk Oversight" function:

- » Risk analytics and reporting (86%)
- » Developing policies and controls and monitoring compliance (81%)
- » Monitoring risk exposure versus limits (73%)
- » Independent verification of risk methodologies (62%)

Several institutions indicated that the responsibility of the risk oversight function is more limited (e.g., develop policies and control procedures, monitor compliance and perform risk analytics and reporting), whereas verification of risk methodologies and monitoring risk exposure is perhaps a secondary function.

Capital Allocation

Regulatory Capital & The New Basel Capital Accord (Basel II)

More than a decade has passed since the BIS introduced the 1988 Capital Accord. In order to improve the risk sensitivity of regulatory capital measures, the Basel Committee on Banking Supervision released a detailed set of proposals (the New Basel Capital Accord) in January 2001. The New Accord provides for progressively sophisticated approaches to calculate minimum capital requirements for credit and operational risk. The new proposal is expected to be finalized by mid-2003 with an implementation date currently stipulated for 2006.

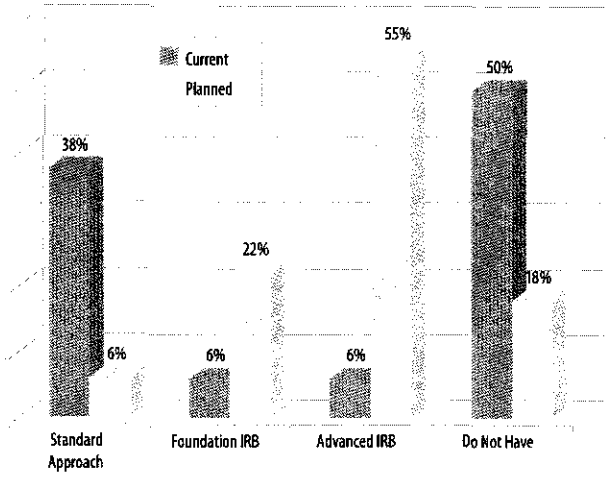
Credit Risk

The survey findings in the sphere of credit risk vis-à-vis Basel II are dominated by the following theme: the Advanced Internal Ratings Based ("IRB") approach is clearly recognized as the preferred target regulatory approach. However, from a data and systems perspective, relatively few banks consider themselves in a position to qualify for this approach today or at the New Accord implementation date.

A surprisingly high proportion (50%) of the respondents indicated that they do not currently have capital allocation approaches to support any of the proposed methods for credit risk capital under the New Accord.

This result appears to support the notion of a significant disconnect between larger and mid-sized institutions regarding their preparedness for the new regulatory regime. In general, the relatively small group of the very largest banks worldwide have remained engaged in the New Basel Capital Accord proposal process, and currently are better positioned to implement the new proposals. Given the absence of complexity in the standardized approach (relative to other methodologies), it is not a surprise that most institutions plan to adopt this approach initially and progress to more sophisticated methods over time.

Capital Allocation Processes for Credit Risk Capital

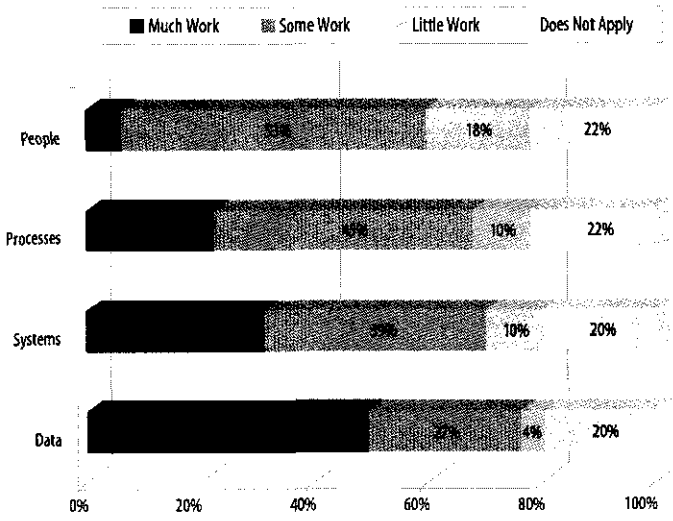


A majority (55%) plan to implement the advanced IRB approach in the future. The results also seem to confirm that most institutions recognize the benefits from ultimately adopting the more sophisticated approaches available for credit risk.

From an implementation perspective, the state of data, systems and processes are viewed currently as inadequate for qualification with the IRB framework as evidenced from the graph below.

In our view, these gaps and challenges stem from a number of trends as the banking landscape has evolved in the last decade. Consolidation within the industry in combination with disparate systems and fractured / linear management around the credit processes has resulted in the absence of any meaningful consistent historical data around credit (default, recovery, etc.) in most institutions. Investment in credit MIS and data stores/data marts has not kept pace with growth in businesses and products, especially in the commercial banking arena.

Areas That Need Work in Order to Qualify for New IRB Approach

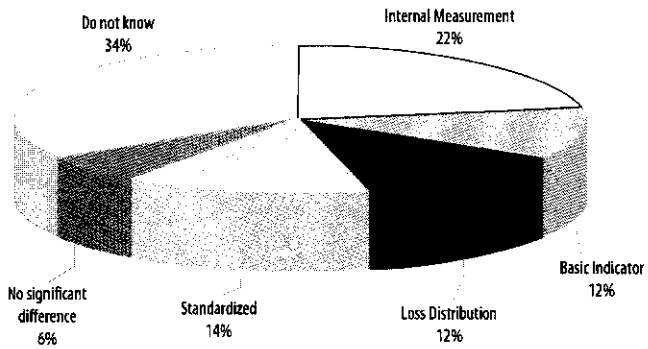


Operational Risk

The greatest focus or area of concern for institutions as they address the New Accord's operational risk requirements so far has been collecting and ensuring integrity of their loss event data history (60% and 54%, respectively). Consistent with this finding is the increased focus on related activities: developing quantitative metrics (52%) and capital allocation for operational risk (52%). Institutions appear to be less concerned about developing qualitative metrics today (33%), probably due to the fact that internal audit and risk managers have become comfortable with such measures over the years.

Similar to our findings in credit risk, a large percentage of the respondents (45%) favor the most advanced approach (the Loss Distribution method) as their target environment. However, there seems to be little consensus with respect to potential for regulatory relief under different operational risk methods. In fact, a little more than a third (34%) of the respondents expressed their inability to judge the methodologies' relative capital requirements while all other choices elicited roughly equal preference.

Highest Operational Risk Capital Relief vs Lowest Investment



In our view, the responses reflect some of the ambiguity that currently exists with respect to implementation of the operational risk proposals. However, the finding indicates inconsistency with the regulatory objective of providing some capital relief from adoption of more sophisticated methods.

Market Risk

The responses relating to market risk clearly demonstrate that the industry has evolved towards sophisticated approaches in line with regulatory intent since the first Basel market risk guidelines came into force more than five years ago. Only 23% of the participants still rely on the standardized approach whereas nearly half (52%) use some form of VaR-based measures for regulatory capital purposes. The experience with market risk may provide a preview of how institutions implement the regulatory framework for credit and operational risk over the upcoming years. However, two factors may complicate the speedy adoption of advanced methods. First, credit and particularly operational data and analytical systems are significantly behind their market risk counterparts due to the scarcity of actively traded markets. Secondly, value-at-risk measures were widely being accepted as an industry standard best practice for measuring and reporting market risk at the time the regulatory rules for market risk were implemented. Economic-based measures for credit and especially operational risk are still in their relative infancy. Consequently, we expect the process of adoption of advanced methods to be slower for these risk types.

Economic Capital and Risk Adjusted Return on Capital (RAROC)

Implementing economic capital allocation systems and processes has been a major focus for many financial institutions for more than 10 years. Many approaches have been developed and used for allocating economic capital that vary widely in terms of level of sophistication and basic approach. For the most part, economic capital methods in place at large financial institutions have had significant influence on the New Basel Capital Accord proposals for regulatory capital.

Two-thirds (65%) of surveyed institutions had some form of economic capital measures in place at the enterprise level. Future plans of these institutions clearly indicate a trend towards more granular and deeper economic capital allocation within the organization. Trends for computation of risk-adjusted profitability measures are consistent but not as prevalent as economic capital at lower levels within the organization. Interestingly, more institutions have RAROC measures at the transaction level (27%) than at the product or desk level (18%). This finding reveals that organizations have probably focused more on risk-based pricing than post-origination performance or profitability measurement.

Relative to the proportion of institutions that assign economic capital for credit and market risks, fewer institutions assign economic capital for operational risk, with slightly less than half of respondents (46%) allocating capital for operational risk. A slight majority (52%) of institutions aggregate institutional level economic capital based on an independence assumption among capital measures from different sources: credit, market and operational. This assumption is likely to be increasingly challenged given the dependencies and correlations in losses observed from different sources in the marketplace.

3 Enterprise Risk Management

12

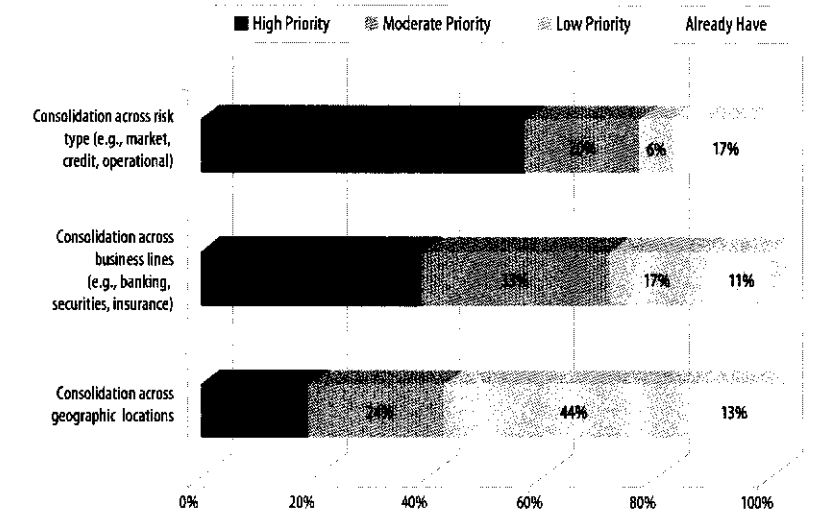
Enterprise Risk Management is an area that draws a lot of attention from risk managers, executives and shareholders. Although its definition varies among practitioners, the conceptual underpinning of ERM is in integrating risk management across risk types (e.g., market, credit, operational, etc.), business lines (e.g., banking, trading, securities, etc.) and geographical locations.

Survey questions in the ERM arena related to the degree of risk integration across the organization, primary areas of focus in the evolution towards the ERM framework, the level of risk consolidation, and the risk management infrastructure integration challenges experienced due to mergers.

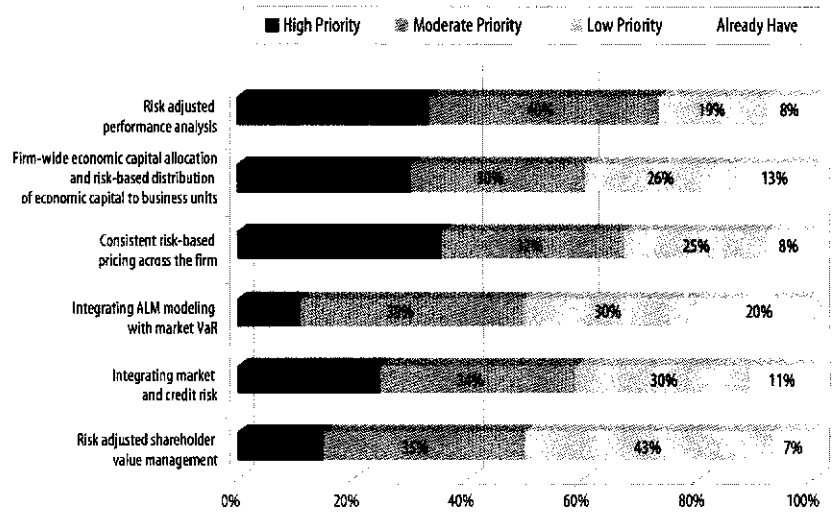
For a majority of participants (57%) integration across risk types is a high priority. Some participants (17%) believe that they have already achieved this integration. Fewer respondents (39%) regard consolidating risk across business units as a high priority. Only 6% of participants indicated that they have the ability to consolidate risk measurement and management across risk types, business lines and geography.

Not surprisingly, RAROC-related component areas, e.g. firmwide economic capital, risk adjusted performance and consistent risk-based pricing, are considered a high priority among the participants (30%, 34% and 36%, respectively). These components are typically pre-

Risk Consolidation



Areas of Focus in ERM Implementation

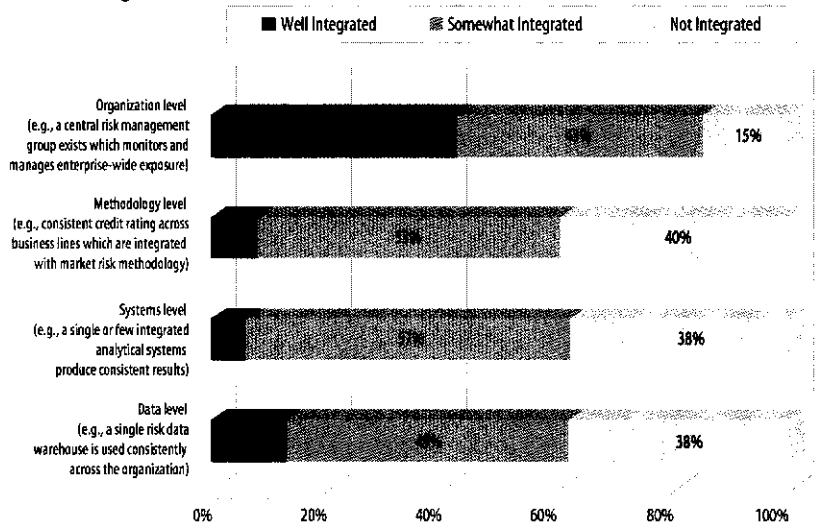


requisites towards implementation of enterprise-wide risk adjusted performance measurement capabilities. Shareholder value management was most commonly reported as a low priority.

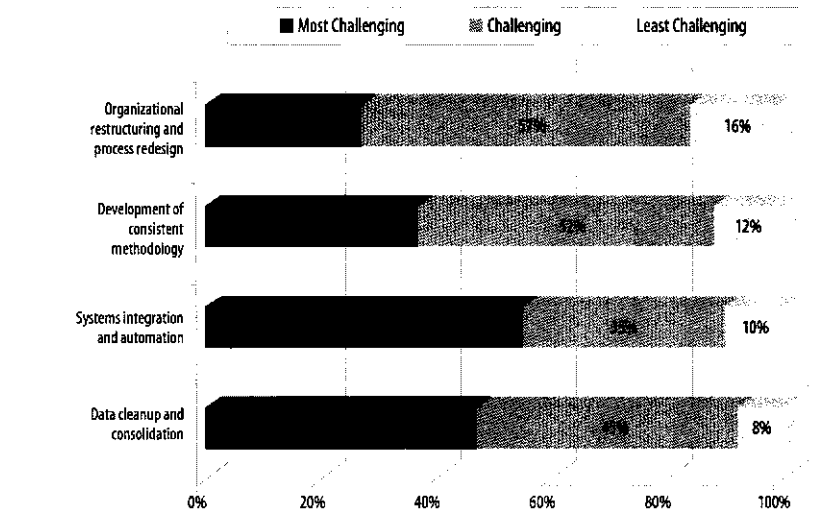
For many of the participants, the risk management integration efforts appear to have started at the organization level, i.e. 43% stated that they already have a well-integrated risk management organizational function. Data, system and methodology integration appears to be less than ideal for many participants. The amount of resources and time it takes to integrate risk data, systems and methodologies may partly explain this finding. Many participants stated that system (55%) and data (47%) related integration issues are most challenging for their ERM implementation.

About 41% of the participants have experienced a merger in the past two years. Among the participants who have experienced a merger, 14% and 18% respectively, stated that their risk management infrastructure is "very well" or "well" integrated. In general, the average responses gravitated towards "somewhat integrated". Among the participants, who have experienced a merger, 64% stated that integrating the data and systems of the merged parties proved to be the most challenging; while for this group compliance with separate regulatory standards was reported as "challenging" by 52%, and "most challenging" by only 9%.

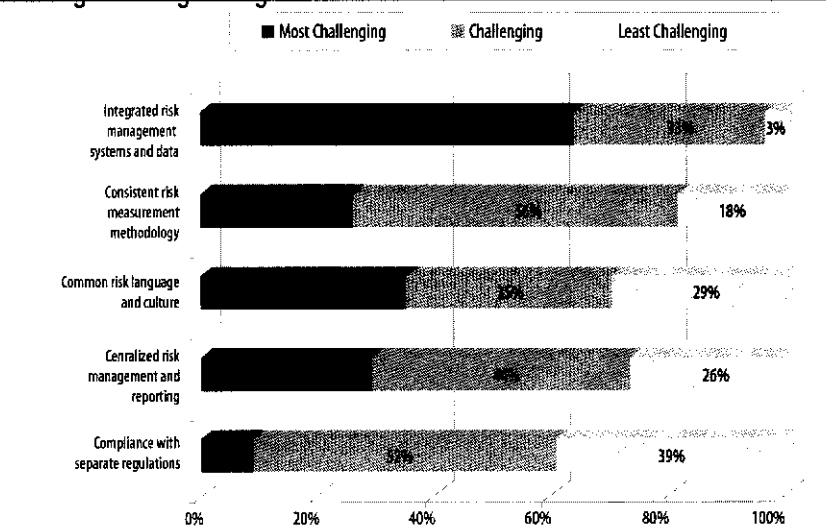
Level of Integration



Challenges in ERM



Challenges in Merger Integration



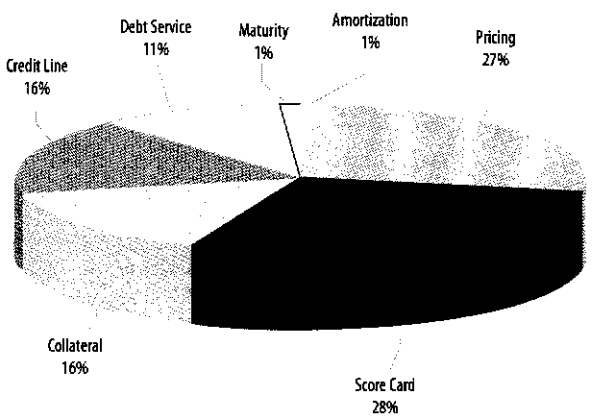
4 Credit Risk Management

14

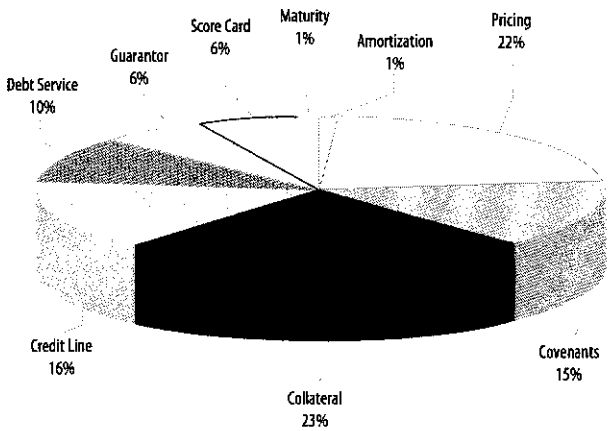
As the credit markets have experienced strong growth in the last decade, the concept of "active" credit portfolio management has attracted increased attention over the traditional "originate and hold" approach. This evolution has become feasible due to developments on both the supply and demand sides with respect to credit. Increased liquidity in the credit markets via structured credit products, advanced risk analytics via quantitative models, and sophisticated risk management products via credit derivatives have gone a long way towards satisfying the appetite of non-traditional credit participants such as insurance companies, pension funds and money managers as they seek improved risk-adjusted yields while achieving enhanced diversification.

Despite the recent recession and poor performance of the credit markets, more than two-thirds of survey participants indicated that they do not intend to tighten their underwriting standards (69% for commercial and 72% for consumer credit). Only a minority of institutions is tightening standards (30% for commercial and 20% for consumer credits) – with the exception being commercial real estate, where 43% of responses indicated a tightening among lenders. For consumer credit, approximately 10% indicated an easing of standards. A possible explanation for the limited tightening at this stage of the economic cycle may be that firms have already adjusted their strategy to address marketplace challenges.

Methods of Tightening Consumer Credit Underwriting Standards



Methods of Tightening Commercial Credit Underwriting Standards



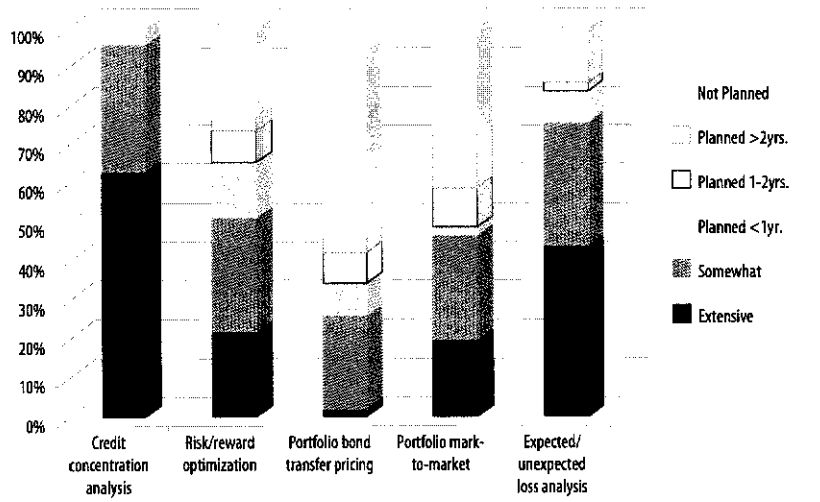
Participants may also feel that risk management tools at their disposal have more adequately equipped them to conduct business effectively in these difficult times. Relative to past slowdowns, the financial services industry, in general, is much better capitalized and therefore has a greater appetite for risk (especially since credit premiums for riskier asset classes have remained high relative to historical experience). Indeed, one of the most frequently quoted tools to tighten standards is pricing (22% for commercial and 27% for consumer), whereas reducing credit lines and credit limits as a way to tighten lending standards attracted only approximately 10% of responses. These findings may be indicative of a growing acceptance of a risk/reward philosophy and comfort with more advanced risk analytics (e.g., scoring and pricing) and hedging tools (such as credit derivatives, see further below) instead of the traditional loss-avoidance approach.

Approximately half of the respondents conduct regular testing of their internal risk ratings, using external ratings as benchmarks and / or internal historical loss experience (53% and 57% respectively (with some using both)). Not surprisingly, these institutions have found their rating system to perform with at least some degree of consistency. Yet, a significant minority (40%) does not conduct any benchmarking analyses on a regular basis, and consequently is unaware of the performance or effectiveness of internal risk-rating systems.

In the area of counterparty exposure measurement and portfolio analytics, many respondents appear to have advanced beyond the basics.
For counterparty exposure measurement, many respondents currently rely on potential exposure calculation at transaction level (46%) and aggregate exposure at the counterparty level (48%). Only 24% continue to use principal plus add-on as the approach for potential exposure estimation. This finding is down from 40% of the participants in our 1999 risk survey. Future developments focus on increasing the use of aggregation and inclusion of collateral and netting agreements in exposure measures. More advanced simulation-based methods are being planned as the target environment at only one in five (19%) respondents.

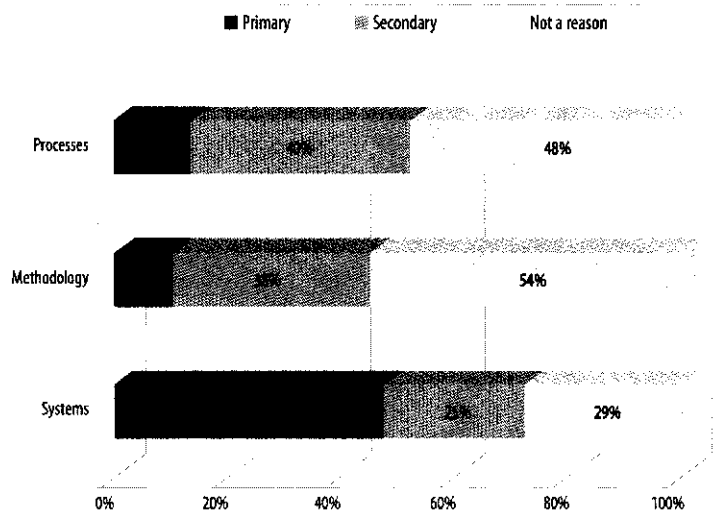
Credit concentration analyses remains the most common approach to credit portfolio risk management (performed by 96% of the respondents to at least some degree and up from 88% of the 1999 participants). Portfolio loss distribution analyses (expected/unexpected loss measures) has broad acceptance among respondents as 44% use them extensively and an additional 32% rely somewhat on this approach. Future developments in this area appear to be focused on developing risk/return and mark-to-market analytics.

Portfolio Management Methods Used



Nine out of 10 respondents (92%) consider the timeliness of credit risk analysis and reporting to be timely or at least somewhat timely, although the largest overall group was somewhat timely (66%). This overall response is a bit surprising given the often-raised systems and data scarcity issues. Indeed, the quality of the credit MIS was cited by 70% of respondents as a key contributing factor for any less-than-satisfactory timeliness in reporting:

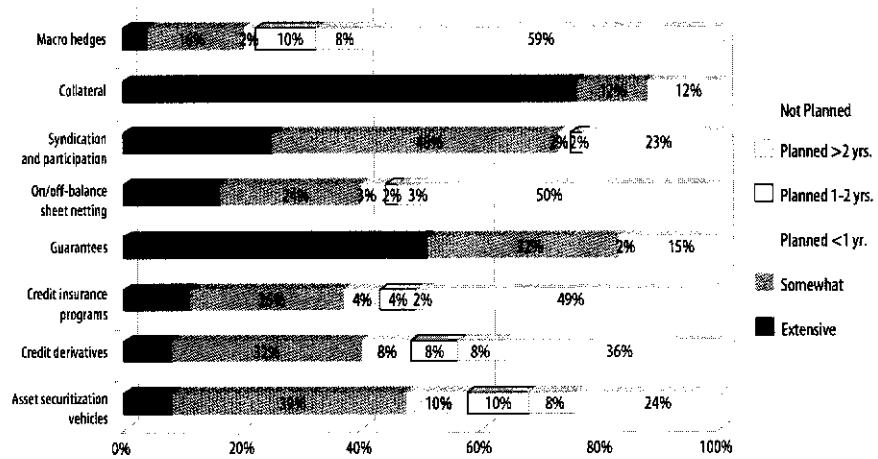
Reasons for Delays in Credit Risk Reporting/Analysis



Credit Portfolio Management

Credit risk mitigation and management currently rely heavily on the traditional tools of collateral, guarantees and syndications with extensive usage reported as 76%, 51% and 25% respectively. Securitization and some newer tools such as credit derivatives, credit insurance and macro hedging are slowly gaining acceptance – possibly indicating a shift towards a more "active portfolio management" approach.

Credit Risk Mitigation Tools Employed



The extensive use of credit derivatives is currently limited, involving mostly single name CDS (e.g., 8% extensively use credit default swaps). A much larger portion (approximately a third of the responses), indicated a more limited use of credit derivative instruments (e.g., 27% reported they somewhat use both credit default swaps and total return swaps). Responses indicate that future reliance on these instruments will more than likely continue to grow, as the interaction between advanced risk management analytics, better systems and use of risk transfer instruments continues to improve.

Market Risk Management

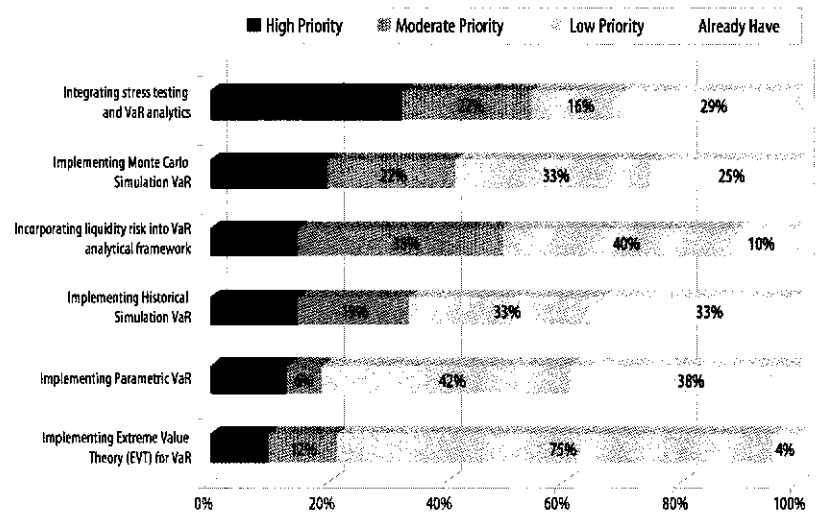
Value-at-Risk and stress testing are among the most commonly used techniques to measure market risk. Many firms and other parties, such as academics and vendors, continue in their quest for improving these methodologies. For example, integrating stress testing with VaR, incorporating event risk and liquidity risk into the VaR framework and improving volatility estimation techniques are among the hot topics of research.

Nearly two-thirds (63%) of the participants already have one or more of the market VaR models (22% have multiple VaR models). Those without a VaR model currently state that it is either a high (50% of this group) or a medium (40%) priority to implement one in the near term.

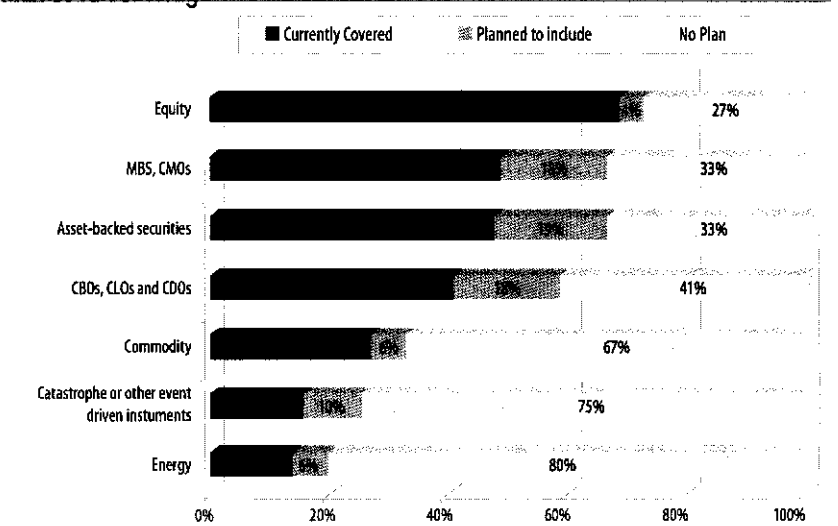
Aside from the VaR model implementation, the participants placed the highest priority on integrating stress tests into their VaR analytics (33%). Incorporating liquidity risk into VaR calculations also attracts medium (35%) to high (15%) priority from participants. Despite the excitement in academic circles, few participants (4%) have already implemented the Extreme Value Theory (EVT) and most do not place a high priority on this approach.

Since most institutions' VaR analytics started with "plain vanilla" fixed-income and foreign-currency instruments, we asked the participants whether their market VaR

Priorities in Market Risk R&D



Market VaR Coverage

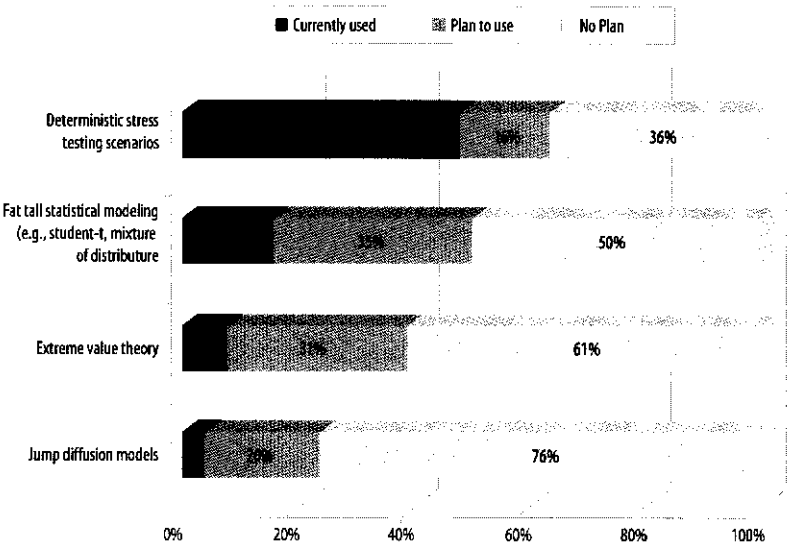


models also handle more complex structured products. The answers varied significantly as not all of these products are traded actively in every market globally. However, a general trend is that many participants report that their models already handle structured products such as CMOs and MBSs (49%), ABSs (48%), and CBOs, CLOs, and CDOs (41%). On average about 20% of the participants plan to include these products in their VaR analytics. Energy and catastrophe instruments are relatively new to the markets and fewer participants cover them in their VaR analytics (14% and 16% respectively). Nearly three-quarters (75% to 80%) of the participants do not plan to include these instruments in their VaR analytics.

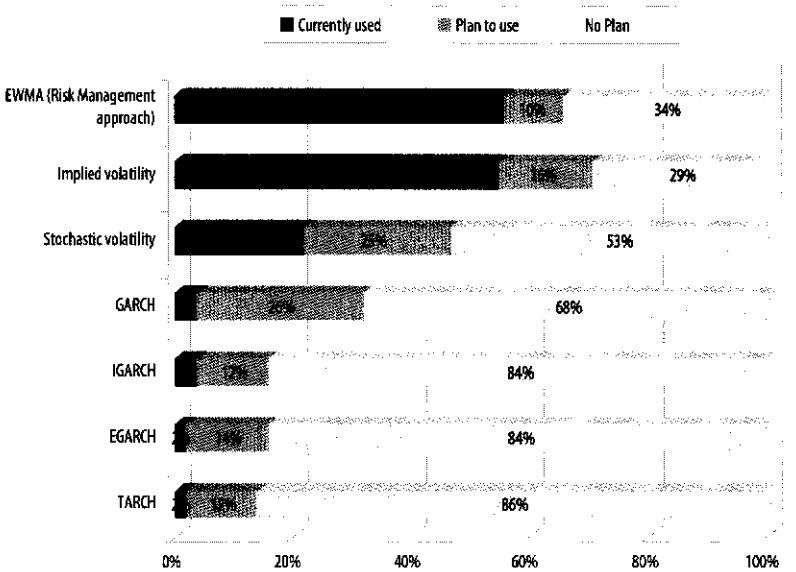
One of the challenges to many VaR approaches is incorporating event risk into the calculations. Many institutions (48%) use stress test scenarios to compensate for this issue. However, many participants plan to implement more sophisticated approaches to integrate event risk with VaR analytics via fat-tailed statistical models (35%), extreme value theory (31%) and jump diffusion models (20%). Interestingly, more respondents plan to use EVT than reported that EVT was a research and development priority.

A key input to market VaR calculations is the volatility of the underlying market prices. We observed that the dominating approaches for calculating market volatility are EWMA (56%) and implied volatility (55%) based approaches. Both of these findings are higher than they were in our 1999 survey, with 33% and 25%, respectively for EWMA and implied volatility, of that group's participants. The largest group of participants updates their market volatility models frequently, e.g. daily (37%). When we

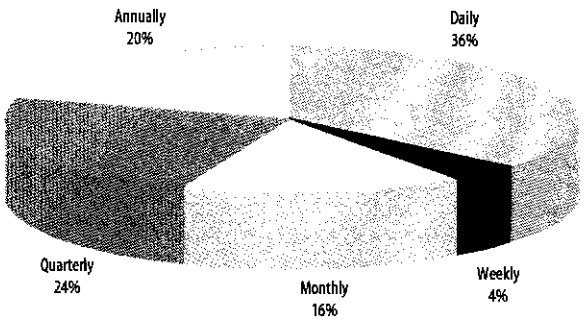
Incorporating Event Risk into VaR Analysis



Volatility Models for VaR Analysis



Frequency of Volatility Model Updates

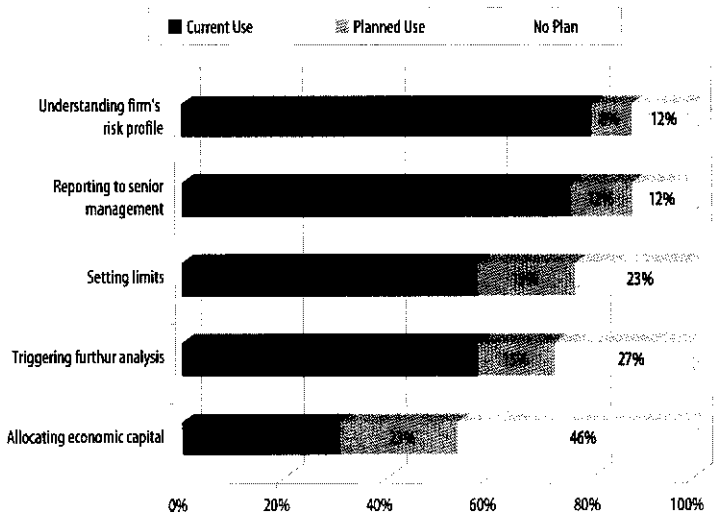


correlate the answers to this question with those of the previous question, it appears that most of the institutions that update their volatility models daily do not use the volatility models cited above. We surmise that they use simple standard deviation calculations or outsource volatility data from risk data vendors.

The results of our earlier surveys and other industry surveys have indicated that the use of stress testing is quite common among practitioners. When we asked the participants about how they use stress test analysis, the majority of the respondents reported they use it for an understanding of the firm's risk profile (81%) and senior management reporting (77%). We believe that these results are due to the more intuitive nature of stress test analysis than VaR analysis. In addition, a significant portion of the respondents (58%) use stress test analyses to set limits and as a trigger for further analysis. An interesting finding is that 30% of participants use stress test analysis to allocate economic capital and 23% have plans to do so.

The most common frequency of stress testing for institutions for all books is "annually". The exceptions are the trading book (where 32% of participants implement stress testing daily) and the banking and investment books (where 38% and 34% of participants, respectively, stress test monthly). Surprisingly, 49% of the participants only stress test their emerging portfolio annually. Contributing to this observation is that many participants implement stress testing at the same frequency across all of their books; only 15% of the participants have a schedule of varying frequency for stress testing depending upon book type. These participants typically stress test liquid and actively traded books more frequently, presumably where there is more robust data available; paradoxically, stress testing may benefit most the portfolios where it is inherently most difficult to apply.

Use of Stress Test Analysis



Market risk measures such as VaR and conventional ALM measures such as Net Interest Income ("NII") and Net Economic Value ("NEV") are increasingly being integrated, as many risk system vendors are focusing on

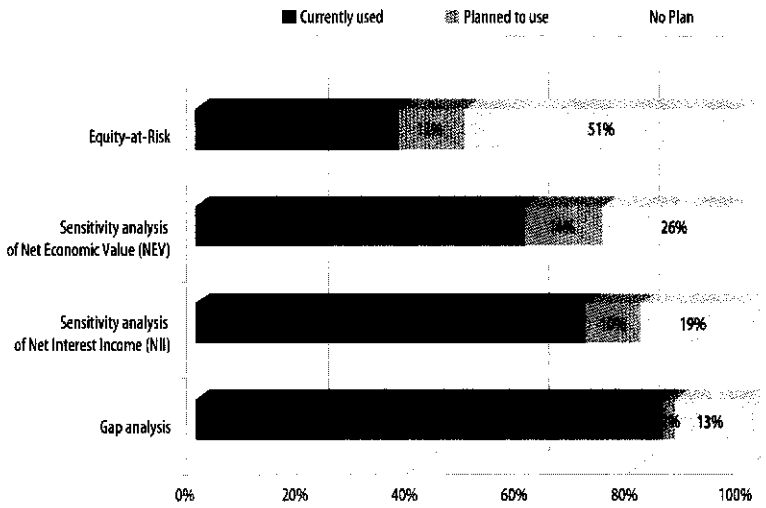
providing forward-looking balance-sheet modeling capabilities. We asked participants about the types of ALM analyses they produce and how they plan to integrate ALM with market risk analysis.

We are not surprised to see that the traditional ALM analysis (i.e. Gap Analysis) still dominates ALM reporting. Five out of six (85%) participants use Gap Analysis in their ALM decision-making processes, while 71% use NII and 60% use NEV sensitivity analysis. As more institutions realize the potential of NEV and NII sensitivity, we expect this difference to decrease. Due to its sophistication and computational intensity, equity-at-risk type of analysis currently is being used only by 37% of the participants. Many institutions report conducting various ALM analyses on a "monthly" basis except for the "Equity at Risk" type of analysis that typically requires a more intense computational run-time. These results confirm our expectations as many institutions typically conduct monthly ALCO meetings that require such analysis.

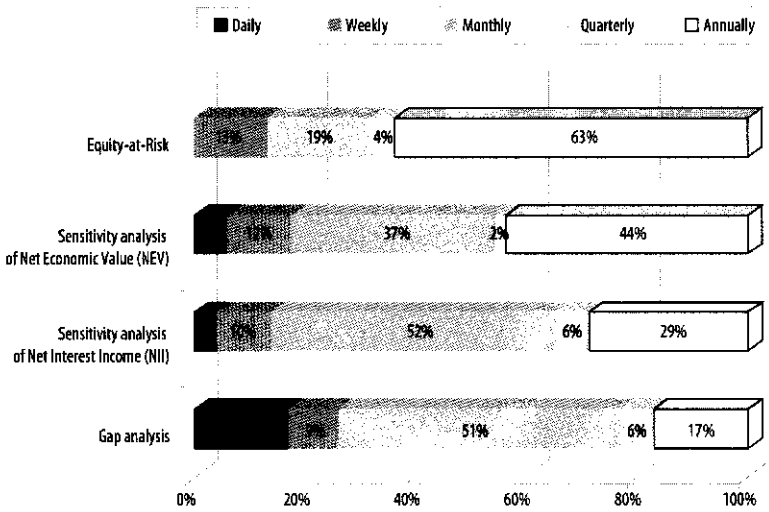
The majority of the participants have at least somewhat integrated interest rate risk management of their banking and trading book (60%), with 14% of the remaining participants planning to integrate within the next two years. The participants who do not have plans to integrate are typically insurance companies, for which this question does not directly apply.

The largest group of the participants (42%) has already implemented a simulation-based ALM system. One third (33%) of participants plan to implement it within an average of 1.4 years.

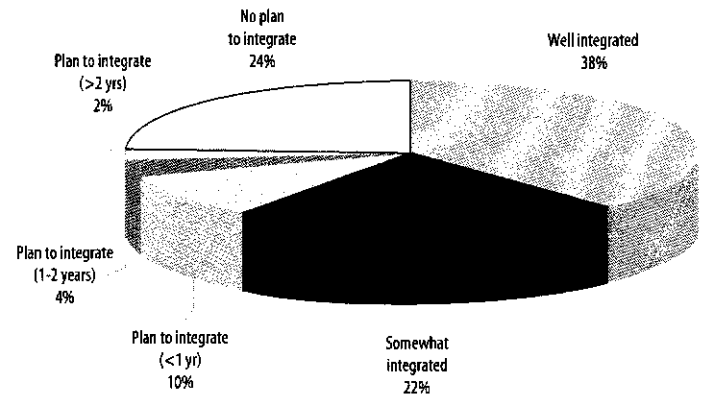
Use of ALM Analysis



ALM Analysis Reporting Frequency



Integrating Interest Rate Risk of Banking and Trading Books



Operational Risk Management

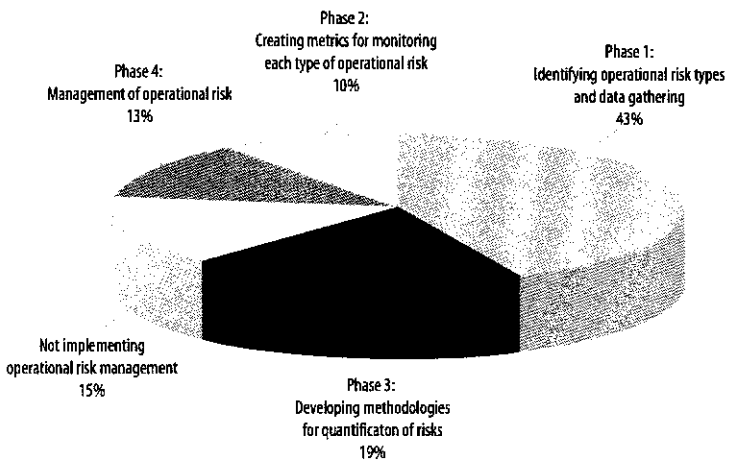
Many financial services institutions have shifted their resources for developing and/or improving their operational risk management processes. This change was also acknowledged in the New Basel Capital Accord, which introduced capital requirements for operational risk and provided a number of methods for quantification of operational risk.

Drivers and Regulation

Operational risk management is still a new concept and has not been fully developed and implemented. Most respondents are in the preliminary phases of implementing operational risk management. The largest percentage (43%) of respondents rank themselves at the beginning of the process, in Phase 1 (identifying operational risk types and data gathering), while 13% of respondents ranked themselves in Phase 4 (management of operational risk). Approximately one in seven respondents (15%) have not begun implementing operational risk management.

Regulatory activity appears to be the biggest driver in respondents' decisions to implement operational risk management with 65% of respondents noting it as a factor leading to their decision to implement operational risk management. As the deadlines for complying with the New Basel Capital Accord have been delayed, most respondents seem to be only in the preliminary stages of implementing an operational risk framework. The other leading contributing factors to implementing operational risk management all relate to strategic management decisions:

Operational Risk Implementation Stage

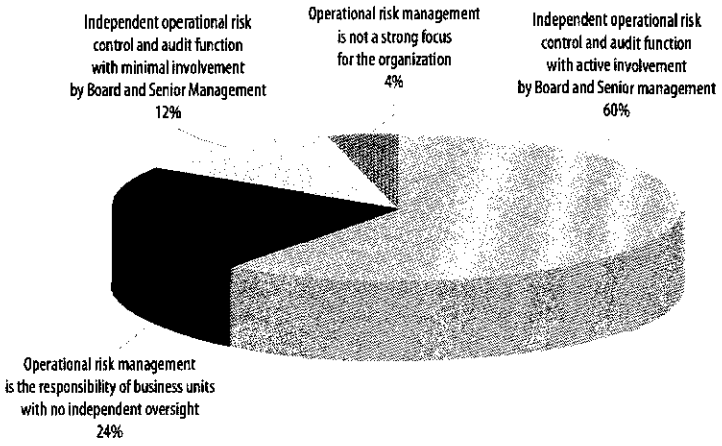


Category	*% of Total Participants*
Responses to regulatory activity	65%
Request of risk management or senior leadership	50%
Develop a competitive advantage	39%
Following an industry trend	37%
Reaction to loss events (either internal or external)	35%

As noted, although the regulatory requirement seems to be the main driver pushing operational risk efforts, many view the benefits as more than just regulatory compliance – it facilitates process improvement and cost reduction.

Currently, the most common operational risk management structure involves an independent operational risk control and audit function with active involvement by the board and senior management (60%) of respondents. Nearly a quarter of the respondents (24%) does not have a centralized operational risk management structure; rather, operational risk management is considered the function of the business units without independent oversight. We would expect this decentralized, unmonitored approach to decrease in popularity as organizations move into the latter stages of operational risk management implementation and as more organizations incorporate operational risk management into corporate strategy.

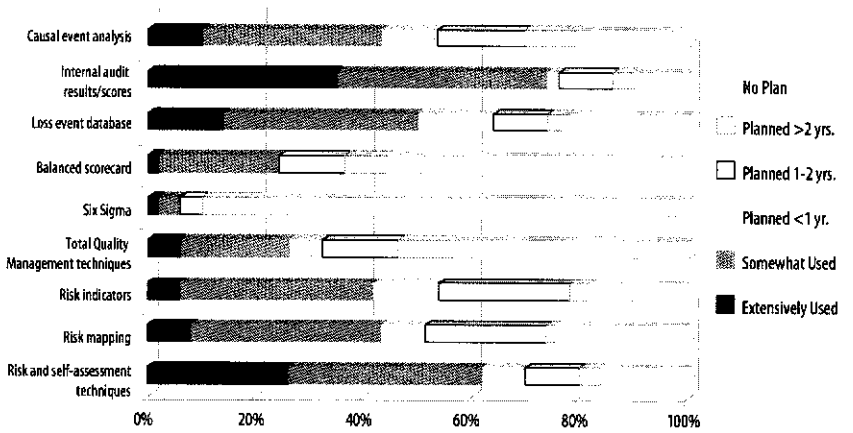
Operational Risk Management Structure



Compliance with internal controls is the main area of focus for operational risk management with all respondents (78% indicate it is a "main focus" and 22% indicate they are "at least somewhat focused" on it). Best practice procedures and cross-organizational/enterprise operational risk management were two other areas that respondents felt had at least some of the organization's focus (96% and 88% indicating at least somewhat of focus areas, respectively). Interestingly, capital allocation was split, being listed quite often as an area of focus for organizations (42%), but also the area that received the highest response rate of having no organizational focus (32%). The idea of quantification of risk for non-financial implications was rarely listed as an area of high focus (22%), but rather listed as an area with at least some focus (78%). This provides further confirmation that the participants view operational risk management as facilitating process improvement and cost reduction.

Internal audit results/scores and risk and self-assessment techniques are the most commonly used techniques for managing operational risk by the respondents' organizations, as shown in the chart on the next page. Techniques such as risk mapping, risk indicators, and causal event analysis are currently not commonly used, but respondents of organizations not using these techniques often list them as being in the short-term planning phases. On the other hand, Six Sigma is used by only very few respondents – and a vast majority do not have plans for its use in the future.

Reliance on Operational Risk Management Tools



As operational risk management becomes more widespread, we expect the usage of additional tools such as balanced scorecards, total quality management and loss event databases will become more prevalent.

The survey participants were split as to whether operational risk benchmarks should be developed with a top-down or bottom-up approach (44% to 38% respectively, and 18% not knowing which approach would be best). This data may reflect the institutions' overall preferences for top-down or bottom-up risk analyses, or biases based upon the current state of operational risk approaches.

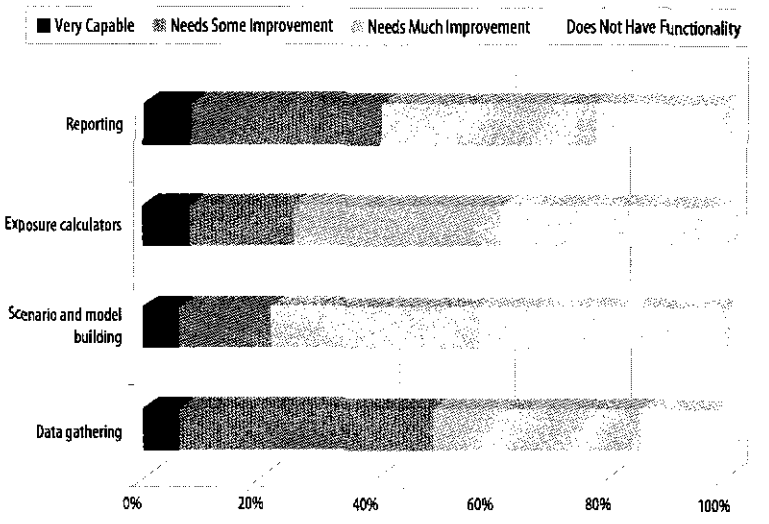
Systems

Survey participants recognize the need for enhancing current operational risk systems and technologies (see chart on the next page). This is expected given the large number of respondents that are in the preliminary phase of operational risk management. It appears most organizations' risk management systems have basic capabilities (such as data gathering and reporting) but lack complex capabilities (such as exposure calculations and scenario and model building). The vast majority of respondents did not believe their organization was very capable in any of the aforementioned functional areas, appropriately recognizing the need for industry-wide improvement. Interestingly, data gathering, which is the building block needed to created advanced capabilities, has the lowest response rate of very capable, but has the highest overall response as an existing functionality. The area respondents most often listed their organization as being very capable in was the reporting function, but, surprisingly, nearly a quarter reported their operational risk management systems do not have any reporting functionality at all.

Given the participants' responses, data gathering techniques are viewed as *important but need much improvement. It would be expected that as the* data gathering functionality improves for the respondents' operational risk management systems, reporting and higher-level functionalities would also improve.

With respect to allocating resources to operational risk management, augmenting the staff level by more than 30% has the highest number of respondents (20%), despite 50% of respondents indicating no plans for an increase in staff. External consulting represents the smallest level of planned increase in dedicated operational risk management resources with only 38% of respondents planning an increase. Since 96% of respondents listed operational risk management as being a strong focus of the organization, it is not surprising that the first place they would plan increases and improvements would be systems and technology and then staff.

Capability of Risk Management Systems



Business Continuity Management

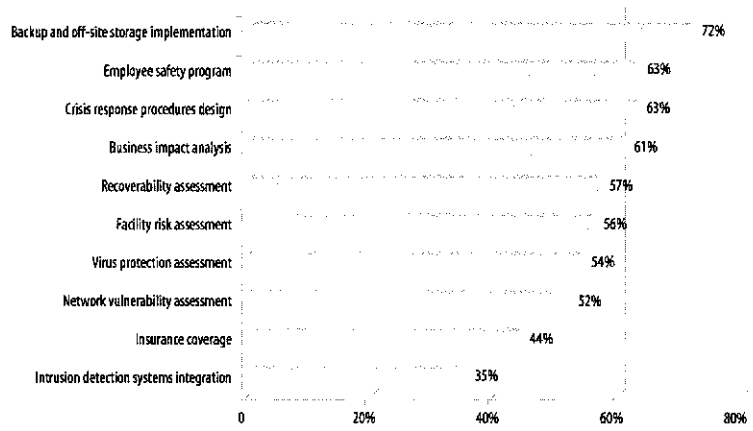
The tragic events that occurred on September 11, 2001 impacted the operational capabilities of many firms beyond any prior occurrences and beyond any anticipation. Many financial institutions were significantly affected by the attacks. Most of these firms are revisiting their Business Continuity Plans ("BCP") and rethinking the depth and breadth of disruptions that can occur in the future.

Respondents reported a variety of impacts as a result of the events of September 11, 2001. A slight majority (52%) of the participants stated that they experienced some form of business disruption. One in seven (15%) participants – mostly the North American banks and those international banks with a considerable North American presence – appear to have been affected more than the others. Reduced workspace (23%), severed communications (23%) and disrupted vendor services (19%) are the three highest ranking effects among the participants.

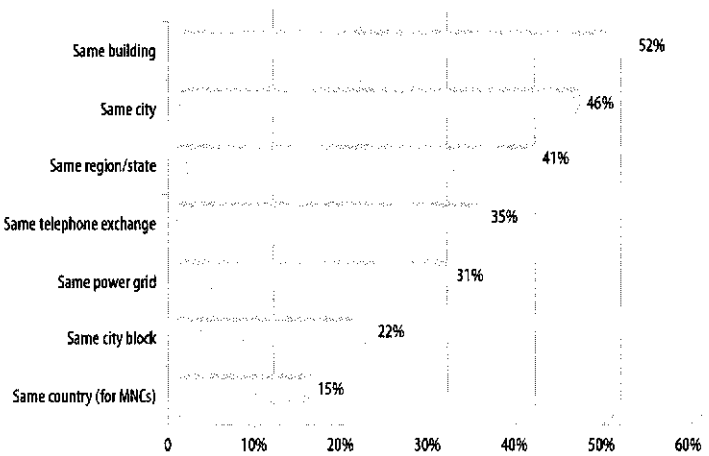
A wide majority of participants addressed traditional BCP areas in their plan such as backup and off-site storage implementation, crisis response procedures, employee safety program and business impact analysis.

The risk of geographic concentration was vividly illustrated by the events of September 11, 2001, in ways that most people had never considered. We witnessed many companies relocating some of their offices and back-up facilities. A majority of participants (52%) responded that their BCP

Top 10 Topics Addressed by Participants' BCPs



Geographic Concentration Addressed by Participants' BCPs



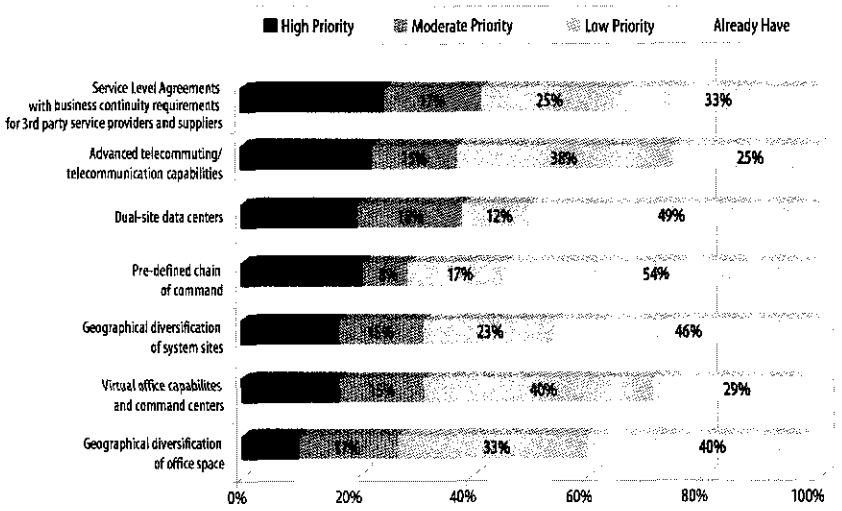
considered geographic concentrations in the same building, with lesser groups reporting that their BCP considered other concentrations.

Some of the topics covered by participants' BCPs have already been implemented, e.g. pre-defined chain of command (54%), dual-site data center (49%) and geographical diversity (46%). In addition, the highest priority being focused on currently seems to be on securing business continuity agreements with third-party service providers (25%) and implementing advanced telecommuting/communication capabilities.

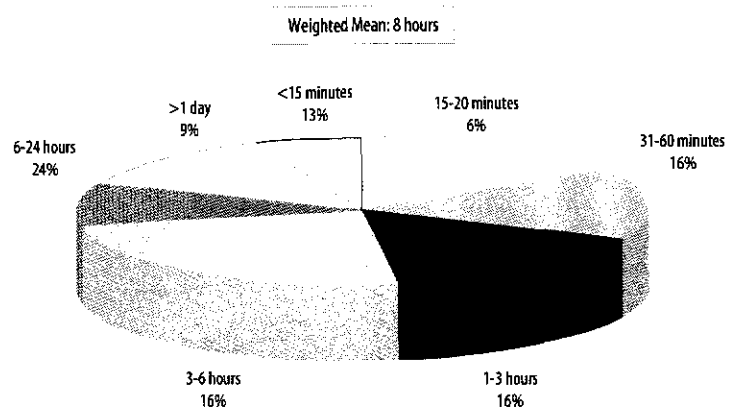
We asked participants to note their best estimate of cost of service interruptions. However, participants did not have a command of the cost impact of such outages and events – all participants stated in effect that they do not have an estimate.

While 22% of the participants did not have a target recovery time for business interruption, the remaining participants stated a varying range of targeted recovery time. We calculated the weighted average target recovery time as approximately eight hours.

BCP Implementation Priorities



Target Recovery Time



Risk Systems and Technology Infrastructure

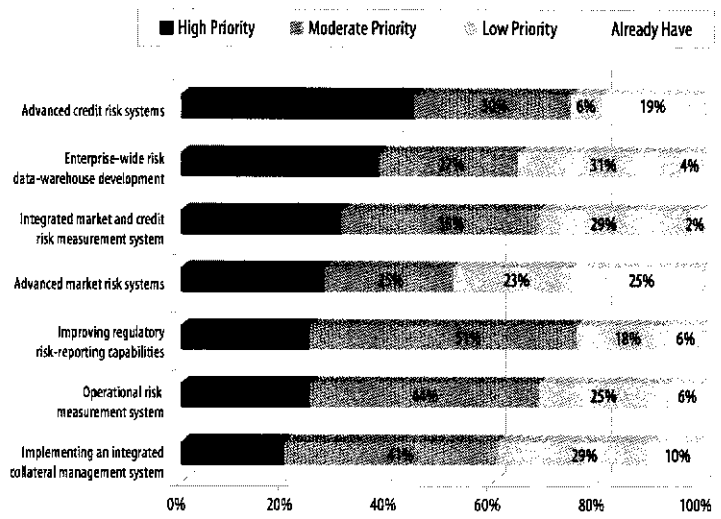
The advances in risk research and supporting software, computer and telecommunications technology have allowed many risk technology vendors to proliferate the market with new and improved risk analytical systems. In this section of the survey, participants identified their priorities for risk IT development efforts, their allocated IT budgets, their concerns with the existing systems, and their criteria for selecting/building risk systems.

Advanced credit risk systems appear to be on the top of the participants' technology investment list. One in five (19%) participants stated that they have already implemented advanced credit risk systems, and 45% placed a high priority on such systems. This theme is a continuation from the 1999 participants who reported that credit risk systems were their highest priority.

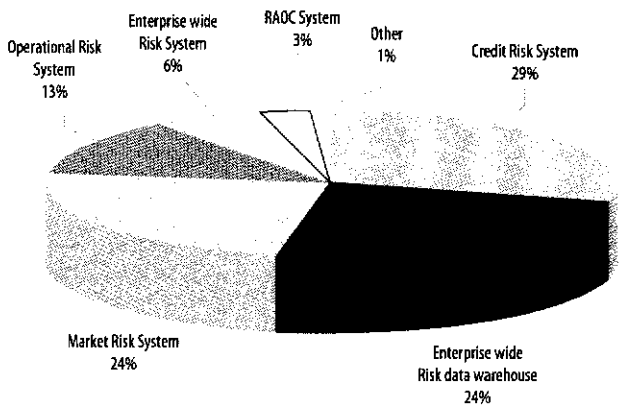
The next highest priority system implementation plan appears to be for enterprise-wide data warehouse development, which is key to attaining an integrated ERM framework. Market risk systems appear to continue to rank relatively high on the priority list.

Risk IT system budgets varied widely for participants. However, we observed that the average annual IT spending budget is approximately $3.5 million and the median IT budget is about $1 million. The highest risk IT budget was stated as $50 million. This dispersion is a function of global institutions' varying sizes, mix of operations and current cutbacks in technology spending at many institutions.

Risk IT Development Priorities



Risk IT Budget Allocation



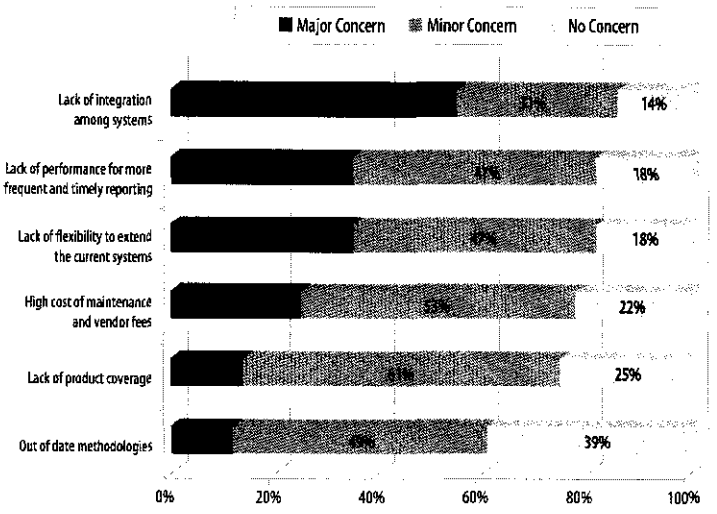
The allocation of the risk IT budget appears to be consistent with the participants' IT implementation priorities (i.e. credit risk systems are allocated the highest budget (29%), followed by the enterprise data warehouse (24%) and market risk system implementation (24%)).

The biggest concern with the participants' current risk management systems appears to focus on the lack of integration between the systems (55% list it as a major concern). This is a continued theme from the 1999 participants, who most frequently reported lack of integration as an issue in their risk systems. Many participants also stated that integrating systems is a major challenge towards attaining an ERM framework.

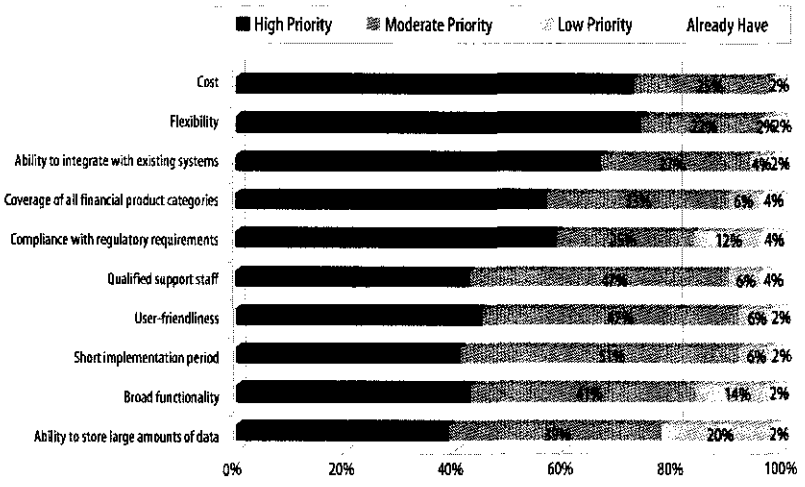
As risk analysis techniques advance and increasingly involve simulations, more computational power is required for frequent calculations and reporting. Many participants (35%) stated that their systems lack the required performance for more frequent calculations. Lack of flexibility to extend the risk systems' functionality is also stated as a major concern by the participants (35%).

When we asked the participants to rank their criteria for new risk IT selection/ implementation, cost, together with flexibility, appears to be listed on the top, followed by integration ability. These prioritized criteria are consistent with most of the participants' responses to the question regarding their concerns with the existing systems.

Concerns with the Existing Risk IT Infrastructure



Criteria for Risk IT Implementation



Conclusion

Risk management in the financial services industry continues to evolve. The results from our survey indicate three broad trends in global risk management:

- » Risk management has gained significance and is now viewed by many financial institutions as being of strategic importance. As a consequence, responsibility for risk management increasingly is centralized and elevated to positions directly reporting to the Board of Directors.
- » The trend towards the use of increasingly sophisticated quantitative tools to assist risk management continues. While this development is driven largely by new regulatory requirements (i.e., Basel II), there is a realization among global financial institutions of the strategic importance of risk management and the desire to improve performance through application of risk-adjusted pricing and portfolio optimization techniques.
- » One of the key challenges for the continuous development of risk management capabilities remains information technology infrastructure – mainly disparate systems and a lack of consistent data. Financial institutions are placing a special emphasis on addressing these shortcomings – when taking into consideration projected budget allocations.

We anticipate that many of the topics addressed in this survey will continue to be of interest to the risk management community over the next few years. Progress towards Basel II Accord implementation and its impact on the banking industry, advances in credit and operational risk measurement, and the evolution towards an integrated enterprise-wide risk return-framework within financial institutions will be watched closely by risk management professionals.

We would like to thank all the participants in our survey for taking the time and effort to complete the questionnaire, providing us with their thoughtful comments and feedback, and allowing us to compile this truly global survey. We trust that this report and the insights gained will prove a worthwhile investment that provides a benchmark against which institutions can assess the state of their risk management capabilities.

In fact, the enthusiastic response and interest generated by this year's survey may be a reflection of the need for just such a reference. We intend to report back within the next two years with a new survey on the progress and new developments relating to risk management for financial institutions and we look forward to sharing the information with you then.

2002 Global Risk Management Survey Contacts

United States
Bob Maxant
1 (212) 436 2560
rmaxant@deloitte.com

Lisa Choi
1 (212) 436 5179
echoi@deloitte.com

Edward Hida
1 (212) 436 4854
ehida@deloitte.com

Japan
Shiguru Furusawa
81 (3) 3457 7382
sfurusawa@tohmatsu.co.jp

Tsutomu Takasuka
81 (3) 3769 8505
ttakasuka@tohmatsu.co.jp

Capital Markets Contacts

Australia
John Kidd
61 (3) 9208 7357
jkidd@deloitte.com.au

Belgium
Frank Verhaegen
32 (3) 800 88 53
fverhaegen@deloitte.be

Canada
Dominic Young
1 (403) 267 1778
doyoung@deloitte.com

Denmark
Jens Hoeck
45 (33) 76 33 33
jhoeck@deloitte.com

England
Andrew Goulden
44 (20) 7303 5063
angoulden@deloitte.com.uk

Germany
Jörg Engels
49 (211) 8772 03
jengels@weditdeloitte.de

Hong Kong
Maria Xuereb
(852) 2852 1008
marxuereb@deloitte.com.hk

Italy
Giacomo Galli
39 (02) 8801 254
ggalli@deloitte.it

Manlio Genero
39 (02) 8801 1
mgenero@deloitte.it

Japan
Keiichi Tao
81 (3) 5512 6221
ktao@dc.com

Netherlands
Duco Wansink
31 (20) 582 4000
dwansink@deloitte.nl

Singapore
Way Yee Bay
(65) 6224 8288

South Africa
Allan Immelman
27 (11) 806 5256
aimmelman@deloitte.co.za

United States
Bob Maxant
1 (212) 436 2560
rmaxant@deloitte.com

Edward Hida
1 (212) 436 4854
ehida@deloitte.com

Lisa Choi
1 (212) 436 5179
echoi@deloitte.com

Deloitte Touche Tohmatsu is one of the world's leading professional services organizations, delivering world-class assurance and advisory, tax, and consulting services through its national practices. More than 95,000 people in 140 countries serve over one-quarter of the world's largest companies as well as large national enterprises, public institutions, and successful fast-growing global growth companies. Our internationally experienced professionals strive to deliver seamless, consistent services wherever our clients operate. Our mission is to help our clients and our people excel.

Deloitte Touche Tohmatsu serves financial services firms globally through our Global Financial Services Industry practice. GFSI's industry specialists represent every major financial center in the world and bring decades of experience and leadership in banking, securities, insurance and investment management to each client assignment. Complex global engagements are carried out by industry specialists who bring the full scope of Deloitte Touche Tohmatsu expertise to client operations around the world. The oversight provided by global practice leaders means that our clients receive uniform, quality service wherever they do business, anywhere in the world. For more information on our practice, visit our Web site at www.deloitte.com/gfsi.

Deloitte Touche Tohmatsu's Enterprise Risk Services practice is a global leader in helping clients manage risk and uncertainty — from the boardroom to the network. ERS provides a broad array of services that allow clients around the world to better measure and manage risk and control, and to enhance the reliability of systems and processes, throughout the enterprise. With core competencies encompassing capital markets, control assurance, internal audit, regulatory consulting, and security services, our ERS professionals offer a wealth of experience across a wide spectrum of industries.

The *2002 Global Risk Management Survey* results were supported by DeloitteDEX™ technology, which is a family of proprietary products and processes for diagnostic benchmarking applications. For more information about DeloitteDEX, contact deloittedex@deloitte.com.

Deloitte Touche Tohmatsu