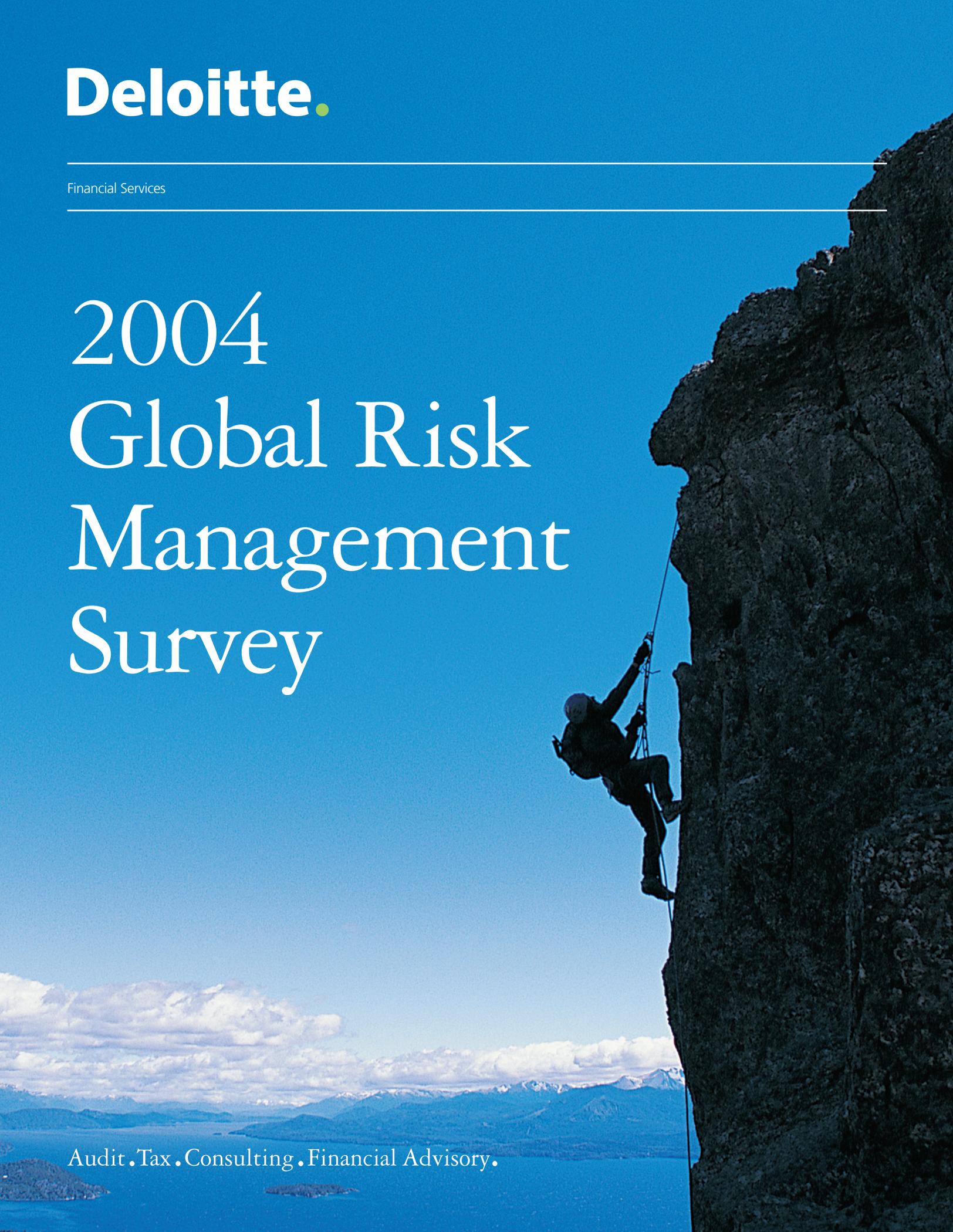


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Financial Services

2004 Global Risk Management Survey

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Dear Colleague:

We are pleased to present our fourth biannual global risk management survey of financial institutions. This year's survey continues our tradition of in-depth analysis and comprehensive coverage of the critical issues facing firms today, and we believe the survey represents one of the most meaningful efforts of its type conducted in the industry. We hope you will find the information relevant and helpful in identifying key industry trends as well as providing context to help you benchmark your company's risk management practices.

The response to this year's survey underscores the substantial global interest on the topic of risk management. We received responses from 162 organizations across the globe with assets totaling nearly \$19 trillion. Participants in this year's survey included firms from all sectors of the financial services industry that varied in size from local institutions to global leaders. We would like to thank the many participants and their companies for the investment of time required to provide the survey responses.

This survey was conducted with the assistance of a network of Deloitte professionals around the world who comprise our global financial services industry practice. We would also like to thank these practitioners for their assistance with, and contributions to, the survey.

As professionals in the financial services industry, we are continually amazed at the industry's accelerating change and the proliferation of new products, instruments and their accompanying risks. On behalf of our firm, I sincerely hope this report conveys these trends to you in meaningful and tangible ways. If you have any questions, comments or would like to discuss the survey further, please do not hesitate to contact one of the local Deloitte representatives listed at the end of this report, or you may call me directly at +1 (212) 436-2560.

Sincerely yours,

Robert Maxant
Global Managing Partner
Capital Markets
Deloitte & Touche LLP

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Executive Summary

There is a saying, “the only thing constant is change,” which has certainly been borne out by the events in the global financial services industry since we conducted our last Global Risk Management Survey in 2002:

- Financial firm mergers and acquisitions continue to go through cycles, with a wave of several mega-mergers currently raising concerns about integrating these businesses, including the risk management systems and processes. The scale of these latest mega-mergers is beginning to raise the question: are some firms becoming too big to properly manage and control?
 - Regulators have continued to influence risk management trends, notably through the Bank for International Settlements (BIS), which this year has issued “Regulatory Capital and International Convergence of Capital Measurement and Capital Standards: a Revised Framework,” the new capital adequacy framework commonly known as “Basel II,” to replace the 1988 Capital Accord. With the Basel II Framework, the BIS has significantly updated credit risk measurement approaches and introduced new methodologies for measuring operational risk and its related capital charges.
 - The post-Enron environment has continued the intense focus on the issues of corporate governance, board oversight, financial disclosures and internal controls. The Sarbanes-Oxley Act in the U.S. and equivalent legislation in other countries has significantly changed the playing field, with the threat of criminal prosecution being a stark reminder of the consequences of non-compliance.
 - Decreased interest rates and other market developments have increased the volume of lending and exposure in both commercial and consumer loan portfolios. Beyond regulatory developments, organizations are investing in credit risk infrastructure improvements because of growth, merger integration and competitive pressures.
 - Off-shoring, near-shoring and outsourcing have become a global trend as firms are forced to focus on their core value-adding activities and to tightly manage costs for non-core activities. These new business arrangements have introduced novel and sometimes difficult-to-manage risks into a firm’s risk profile. Compounding this problem are the communication complexities in situations where affiliates are operating in countries with different cultures, business practices, geographies and time zones.
 - Risk management system vendors continue to develop new capabilities to address the growing mandate for risk management and compliance-related requirements, including those from Basel II, Sarbanes-Oxley and their equivalents.
- In the pages that follow, we present the results of this year’s Global Risk Management Survey. The survey is a comprehensive look at global risk management practices across financial institutions. Following the tradition established in our three previous surveys, we have addressed a range of key risk management issues facing these firms including:
- Risk Governance
 - Regulatory and Economic Capital
 - Enterprise Risk Management
 - Credit Risk Management
 - Market Risk and Asset/Liability Management
 - Operational Risk Management
 - Risk Systems and Technology
 - Extended Enterprise Solutions

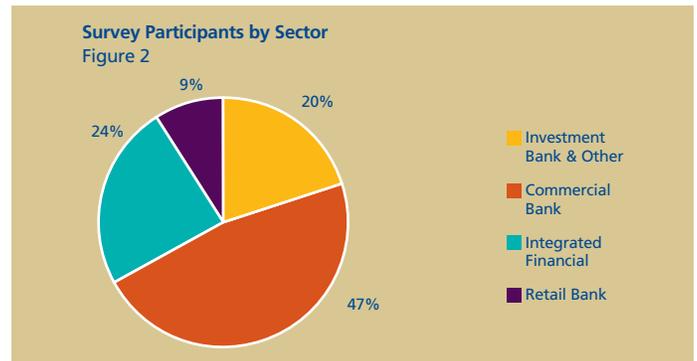
In order to provide a basis for comparison, many of the survey topics and questions are similar to those in our prior surveys, the last of which was conducted in 2002. We made several changes to the topics included in this year's global risk management survey based upon feedback we received regarding their importance. We deleted the business continuity section from our last survey which was included based upon the heightened attention paid to this topic following the terrorist attacks of September 11, 2001. We added the topic of extended enterprise solutions this year because of the rapid growth of this important business arrangement, and the complexity and challenges of managing the associated risks.

We are excited about the responses of the substantial group of participants this year, both in terms of the number of companies, as well as their composition. We had 162 participants in this year's global risk management survey reflecting a wide range of financial institutions. Participants spanned the globe and included responses from major firms headquartered in six of the seven continents. We believe the size and composition of our 2004 survey sample provides a rich data set that reflects current and near-term trends in risk management within the financial services industry.

As shown in Figure 1 below, our survey participants were well distributed among the four major geographic regions of the world (segmented by geographic location of headquarters). Similar to our previous survey, the region with the greatest number of participants was Asia-Pacific (31%), followed by Europe (26%), South America (25%) and North America (17%).

Figure 2 above presents our survey sample segmented by financial services sector. Our survey sample included responses from 12 financial services sectors which we have summarized into four categories. The sector with the most participants was banking, with commercial banks comprising the largest single sector group, followed by integrated financial institutions and retail financial institutions. The remaining nine sectors comprised 20% of the responses.

In addition to representation across geography and sector, our survey participants included a broad range of sizes measured in terms of assets. We grouped survey participants on a logarithmic scale as shown in Figure 3 below. The two largest groups had the greatest number of participants, but there were still a sizable number of companies in the two smallest categories. The distribution of participants was helpful in understanding both the range of risk

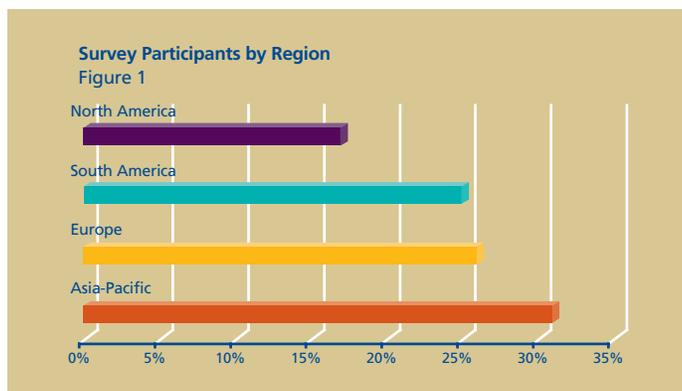


management practices employed as well as the relative rate of adoption between larger and smaller firms.

Our goal in conducting this survey was 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 supported by the survey responses. We believe that our findings will provide a useful benchmarking tool both for the participants and for the larger risk management community within financial institutions. We conclude this introduction to our survey report with an overview of key observations for each of the subject areas covered in the survey.

Risk Governance

The heightened importance of governance and risk management has been a clear trend over the past several years. Corporate scandals and the resulting legislation have tightened the focus of management on regulatory compliance and corporate governance. One tangible impact of the renewed visibility of risk governance is the increased involvement of the board in risk oversight, with a 25% increase in firms stating that the board or a board-level committee has overall responsibility for risk management. There was also a 25% increase in proportion of participants with a CRO or equivalent, from 65% of respondents in 2002 to a substantial majority of 81% this year. Rounding out the increased visibility accorded risk management is the elevated reporting lines of the CRO: 75% of respondents indicated the CRO reports to the CEO, the board or a board-level risk management committee.



Regulatory and Economic Capital

The development of more sophisticated capital calculation methodologies continues due to both business and regulatory drivers – primarily Basel II. The greatest emphasis has been on credit and operational risk due to the relative maturity of market risk requirements. For credit risk, the Basel II Framework has encouraged banks to develop more sophisticated regulatory capital calculation frameworks based upon economic capital techniques. For operational risk, the Basel II Framework has helped spur substantial development of quantitative measures for this difficult-to-measure risk type. While compliance with regulatory requirements is an imperative itself, we see major institutions using this opportunity to transform the way they look at economic capital and even their finance functions. A continuing challenge is the applicability and practicality of these efforts for smaller and mid-size institutions who may feel pressure from the development of more sophisticated capital approaches at the larger institutions.

Enterprise Risk Management (ERM)

ERM continues to be an elusive goal for many institutions. Aside from philosophical and definitional issues, the challenges in actually managing risk on an enterprise-wide basis have proven daunting. Less than one quarter of participants reported being able to integrate risk across any of the major dimensions of risk type, business unit or geography. Respondents indicated a continued focus on measuring economic risks including credit, market, operational and liquidity within their ERM frameworks. We use the integration of market and credit risk as a proxy for risk consolidation progress, and this year's results show 38% of participants reported integrating the organizational structure for these risks, but much lower responses were received for integrating methodology, data and systems (between 15% and 16% for each). Our results indicate that additional effort and resources will need to be expended to achieve a truly consolidated, enterprise-wide view of a firm's risks.

Credit Risk Management

Credit risk management capabilities showed meaningful development since our last survey. The influence of Basel II requirements, commercial credit market difficulties, and increased volume — primarily due to decreased global interest rates in the consumer sector — have increased attention and resources directed toward credit risk management capabilities. The effort to strengthen credit risk management capabilities has been pronounced in both the commercial and consumer credit areas, with 61% of respondents planning a high or moderate level of investment over the next 12-24 months for commercial credit, and 53% for consumer credit.

Much of the effort has focused on core capabilities. These core capabilities include benchmarking of internal ratings where 72% of survey participants reported that they regularly engage in this exercise (up from 54% in prior survey). We also saw increases in usage of more sophisticated portfolio management methodologies and credit mitigation methods. Notable increases in traditional credit mitigation techniques include a 20% increase in usage of

on/off balance sheet netting while use of credit derivatives increased significantly, especially among the largest firms.

Market Risk and Asset/Liability Management

Many of the market risk analyses commonly used build upon the seminal developments in value-at-risk of the 1990s. Many firms are continuing their developments in this area by adding coverage of additional product types such as asset backed securities. Asset type coverage is influenced by larger trends as illustrated by the decrease in coverage of energy commodities, perhaps as a result of reduced use of these products in the post-Enron environment. Advanced modeling techniques such as event risk showed increased usage. Additionally, participants reported an increased frequency of updating model volatility parameters, suggesting a more systematized and developed infrastructure. The frequency of stress testing also showed an increase which indicates a greater attention and requirement for current market risk analyses.

Asset/liability management also continues to build upon core analytics and methods in place. Professionals in this area frequently reported a number of practical challenges that they continue to address. Integration of various books and on- and off- balance sheet positions continues to pose challenges for some. In addition, the proportion planning to implement simulation-based analyses increased.

Operational Risk Management

The Basel II Framework's new AMA requirements for operational risk continue to pace the development of operational risk methodology for many firms. Perhaps more than in any other area, operational risk management is impacted by compliance with new regulatory initiatives. Respondents cited "response to regulatory activity" as the most important driver behind their operational risk management efforts.

The Operational Risk Management (ORM) area continues to be a relatively new and developing field, as compared to some of the more established risk management disciplines. In comparison to the 2002 survey, respondents reported some movement along the ORM development lifecycle to more advanced states of development. However, the majority of respondents are still in the beginning implementation stages. Another notable finding was a drop in the number of companies reporting that they did not have an ORM program in place. This indicates that many of the firms not originally planning to address this important risk have now developed mandates to implement ORM capabilities.

Firms implementing ORM programs heavily favored the centralized oversight model for this particular risk type, with over three-fourths of respondents describing their approach as an "independent operational risk control and audit function." The tools used in ORM programs continue to be diverse and varied due to the nature of operational risk, but self-assessment tools were the most widely used, with a majority of respondents using such tools. The capability of ORM systems continues to be a challenge for a substantial majority of respondents who indicated that at least some improvement in functionality is needed.

Risk Systems and Technology

Information technology is the key enabler of risk management infrastructure. Respondents to this year's survey pointed to a host of continuing challenges with their risk systems and technology infrastructure. Chief among them was the lack of integration among systems, with a majority (52%) of respondents citing it as a major concern and another 42% a minor concern. Lack of flexibility and scalability as well as performance issues impacting reporting capabilities were also noted as key challenges. Respondent firms employ several approaches to system integration with point-to-point batch interfaces the most frequently used. Notably, manual data transfers and dual keying of data are still used by a meaningful number of respondents, indicating the ongoing challenges and risks present in most financial institutions' technology environments.

Continuing a theme present throughout our survey findings, respondents indicated that regulatory related systems capabilities were their highest priority. More specifically, improving regulatory reporting as well as implementing operational risk management and advanced credit risk systems were the three highest priority items in our results. Echoing this theme were our results regarding selection criteria for technology solutions where compliance with regulatory requirements was deemed very important by an overwhelming 86% of respondents. The second most important selection criteria was the ability to integrate with existing systems (82%), a result that supports the continuing importance of system integration.

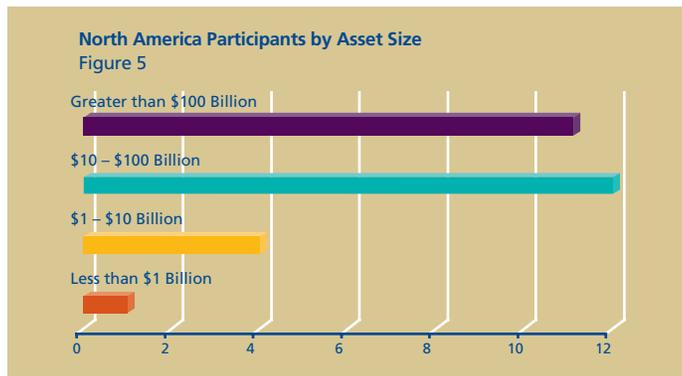
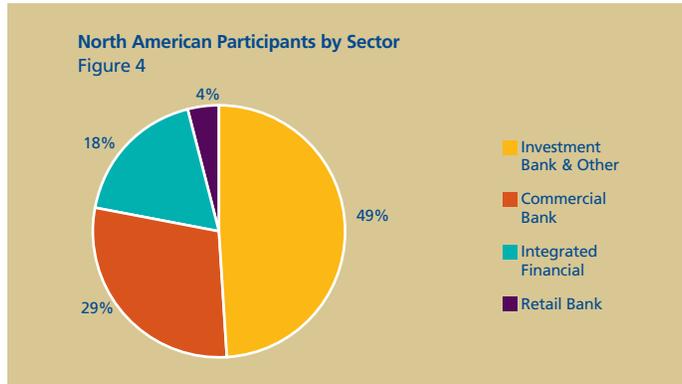
Extended Enterprise Solutions

Extended enterprise risk management is a new section for our survey due to the increase in the usage and unique risks of such arrangements in the last two years. Our survey questions queried participating companies on their current off-shoring, near-shoring and out-sourcing arrangements across a variety of corporate functions. IT and application management was the only area where a majority of respondents (61%) employed an extended enterprise solution, but slightly less than half of respondents used one for call centers and/or back office processing. Given these preferences, it is not surprising to see that respondents considered operational and IT risks to be of greatest concern. Interestingly, despite the geographic diversity inherent in these types of arrangements, 63% of respondents considered geopolitical risks to be low. In terms of managing the risks associated with extended enterprise solutions, our results show contractual arrangements and up-front vendor due diligence in combination with regular internal audits were the preferred approaches. Regardless of risk management approaches utilized, a majority of firms felt there was at least some level of integration between their institutional and extended enterprise risk management programs.

Regional Observations

This section of our report provides some perspective on participant representation and variations in participant responses by region. Especially noteworthy were differences among regions on the topics of risk governance, economic and regulatory capital, and operational risk management. > > >

North America

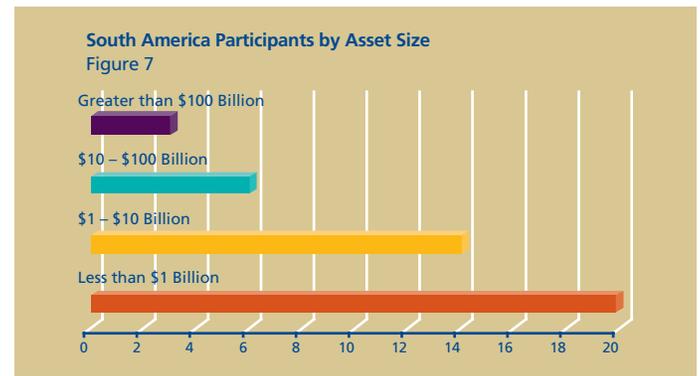
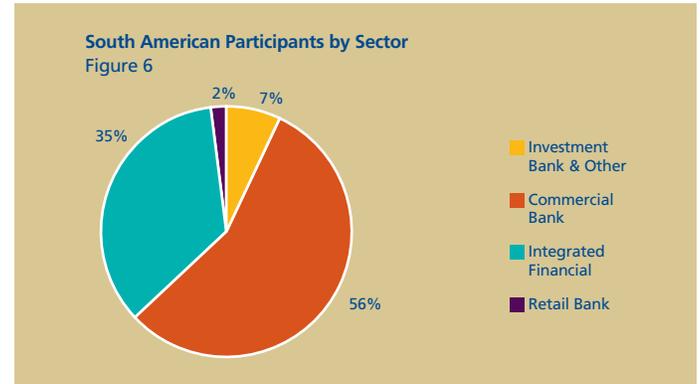


In North America, there were 28 participants. The participants spanned the range of financial institution types, with investment banks and other institutions the largest group and integrated financial institutions the next largest.

Notable regional findings:

- The broadest distribution of responses regarding overall responsibility for risk management with the board of directors and CRO each receiving 21% of responses
- The second largest proportion of participants that did not have a CRO - 25%
- The largest group of participants indicating that their Sarbanes-Oxley and ERM programs were either somewhat or very integrated (67% in total of these categories)
- 31% of responding firms do not calculate/use an economic capital framework

South America

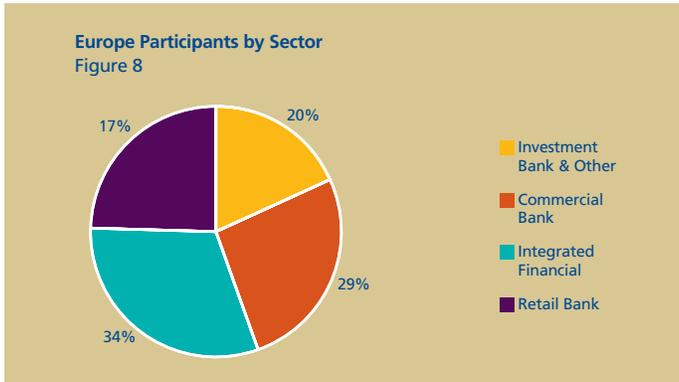


In South America, there were 43 participants. The participants were almost all commercial banks or integrated financial institutions with commercial banks by far the largest group.

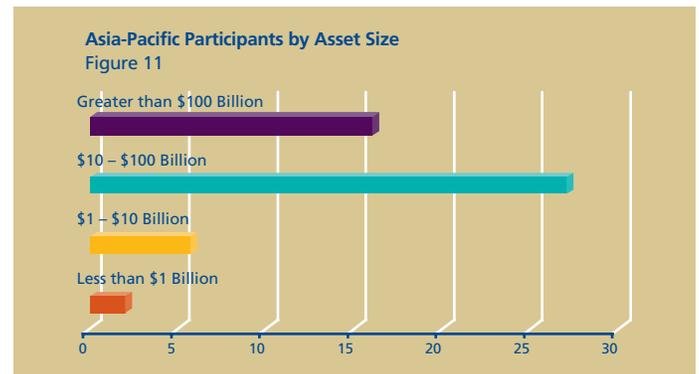
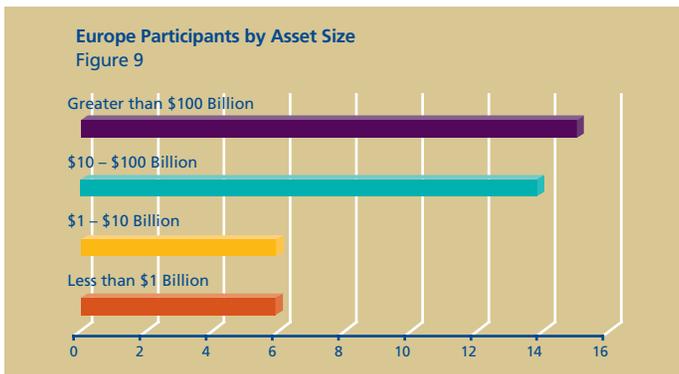
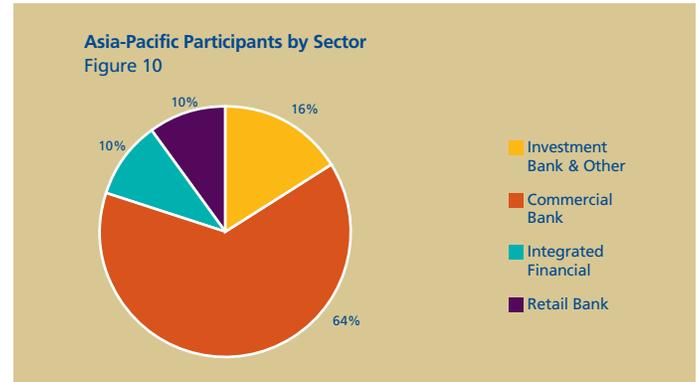
Notable regional findings:

- The only region where “board level risk management committee” was cited most frequently as having overall responsibility for risk management
- The region with the highest proportion of respondents with a CRO – 95%
- 42% of respondents indicated the CRO reported to the CEO, the highest proportion of all regions
- South America had the largest proportion of firms that do not calculate economic capital - 49%

Europe



Asia-Pacific



In Europe there were 41 participants, and the region had a relatively even distribution among the sectors. Integrated financial institutions provided the greatest number of participants with commercial banks just behind, investment banks and other were third, and retail banks fourth.

Notable regional findings:

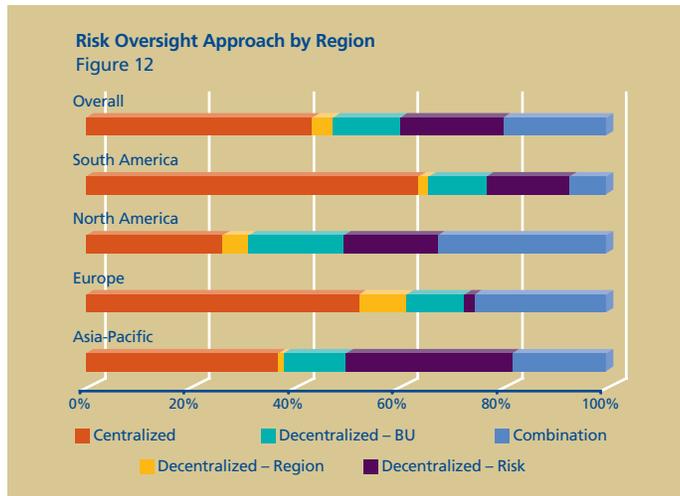
- 46% of respondents cited the board of directors as having overall responsibility for risk management – the second highest total among the regions
- The region with the second highest proportion of respondents with a CRO – 88%
- 12% of respondents indicated the CRO reported to the CFO, the highest proportion of all regions
- 21% of firms responding indicated that their ERM and Sarbanes-Oxley (or equivalent) programs were managed separately
- Europe had the largest proportion of firms that calculate economic capital - 80%

In Asia-Pacific there were 50 participants. The participants were a wide range of types of institutions, however commercial banks dominated as the largest proportion of respondents.

Notable regional findings:

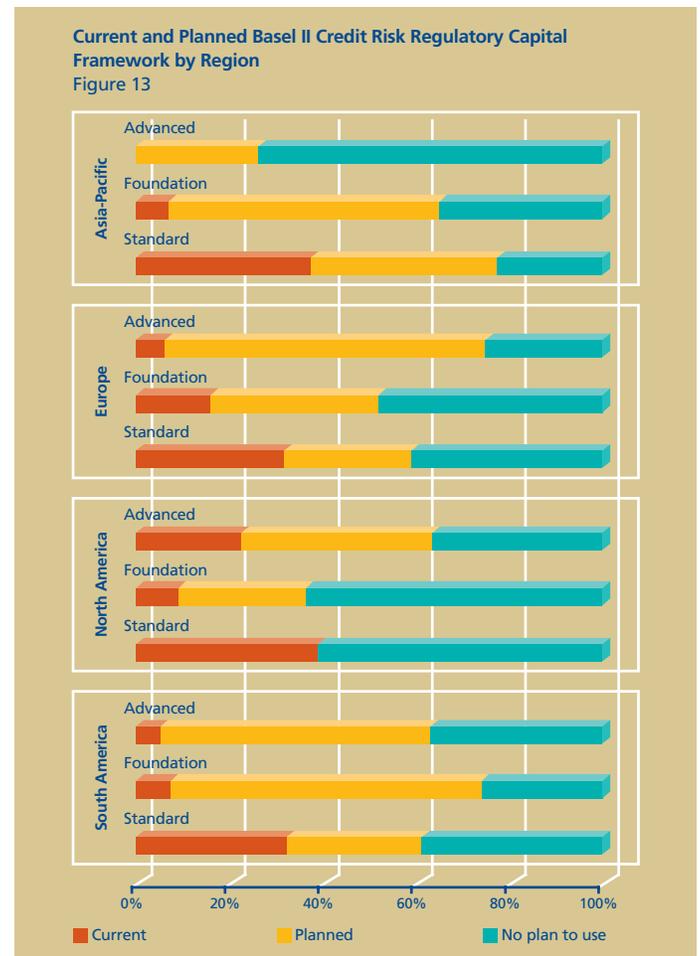
- Asia-Pacific had the largest proportion (47%) of participants indicating that their board of directors has overall responsibility for risk management
- The largest proportion of participants that did not have a CRO – 29%
- 46% of respondents indicated the CRO reported to the board of directors, the only region where the board of directors was the most popular choice
- 68% of firms reported no ERM or Sarbanes-Oxley (or equivalent) program – the highest proportion among the regions

Risk Governance Approaches by Region



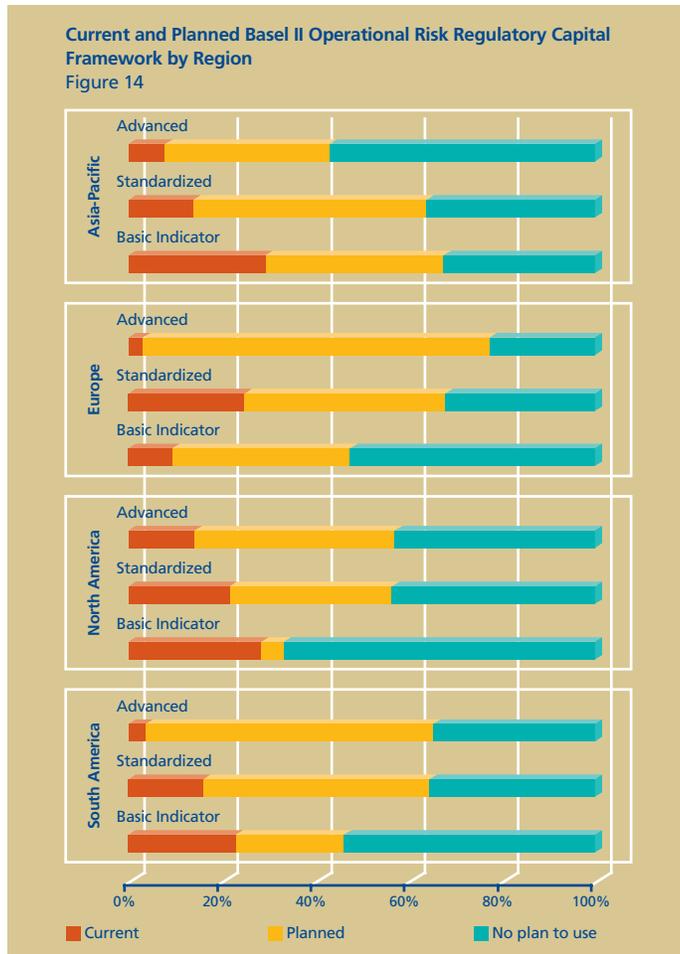
Approaches to risk governance varied substantially across regions with South American and European firms preferring the centralized model and Asia-Pacific and North American firms opting for a greater mix of approaches. Some of this result can be explained by the relative size of the firms within each region as larger firms tend to favor a mix of centralized and decentralized approaches whereas smaller firms tend toward the centralized model. As our regional demographics show, smaller firms comprised a greater portion of the South America and to a lesser extent the European survey respondents when compared to the North America and Asia-Pacific regions. To the extent our survey results are reflective of the overall market composition, we can conclude that risk governance preferences are somewhat dependent on region, but are primarily driven by firm size.

Basel II Credit Risk Regulatory Capital Framework by Region



Firms differed by region in assessing their current and planned Basel II credit risk frameworks. In evaluating current capabilities, slightly more than one-third of firms in each region felt they met the Standard Framework requirements. Substantially fewer firms felt their current capabilities met Foundation Internal Rating Based (Foundation IRB) or Advanced IRB (AIRB) requirements. The exception was North America where 22.7% of firms believed their current capabilities qualified them to use AIRB – significantly higher than other regions. Meaningful divergence among the regions was notable when viewing their planned risk frameworks. Asia-Pacific firms indicated a clear preference for Foundation IRB as nearly 75% indicated no plans to adopt AIRB. At the other end of the spectrum were European firms where nearly 70% indicated plans to adopt AIRB, nearly double the respondents planning to adopt Foundation IRB. North America had the most pronounced preference for AIRB with a majority of firms not planning to adopt either Foundation IRB or the Standard method. South American firms were perhaps the most ambitious with 67% of respondents planning to adopt Foundation IRB and 58% AIRB, many firms indicating both methods.

Basel II Operational Risk Regulatory Capital Framework by Region



As with Basel II credit risk capital, respondent firms showed variability in their current and planned capabilities with regard to operational risk capital frameworks. In a pattern very similar to credit risk, Asia-Pacific firms showed a strong preference for the Basic Indicator and Standardized Approaches instead of the Advanced Measurement Approach (AMA). In fact, Asia-Pacific was the only region where a majority (>50%) currently or plan to use the Basic Indicator Approach. North American responses showed an overall higher level of current capability than the other regions and a decided planned preference for the Standardized Approach and AMA. Europe showed the highest current response rate for the Standardized Approach – 25%. These firms also seemed the most ambitious about future plans with almost three quarters planning to adopt AMA. As with credit risk, many more South American firms are planning to adopt the Standardized Approach and AMA over the Basic Indicator Approach.

Operational Risk Management



The implementation status of operational risk management (ORM) programs varied notably by region with Asia-Pacific and Europe showing the highest number of firms progressing to phases 4 and 5 (For an explanation of ORM phases, see Figure 45). Interestingly, Asia-Pacific also had 83% of the firms indicating no plans to implement ORM. European firms consider themselves farther along in general than the rest of the regions as evidenced by the higher ratio of firms in the later phases versus the earlier phases. Both North and South American respondents indicated their implementation efforts were currently more focused on the early stages with relatively fewer firms responding that they had reached phases 4 or 5. Overall, our results indicate that a near majority of firms (49%) are in the preliminary phases 1 and 2 of implementing ORM capabilities, but that certain regions are advancing faster than others.

Risk Governance

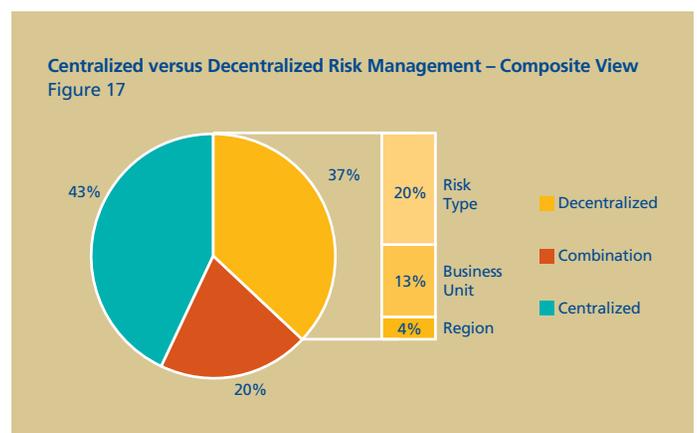
The heightened importance of corporate governance and risk management has been a clear trend over the past several years. Corporate scandals and the resulting legislation have tightened the focus of management on regulatory compliance and corporate governance. Our results show that the ascension of the risk management function in both visibility and organizational importance continues.

Varied Organizational Approaches to Risk Oversight

The overall responsibility for managing risk has been elevated in many institutions to the board of directors (38%) or a board level risk management committee (21%), making it a focal point of governance strategy (Figure 16). In comparison to our survey in 2002, where 47% of respondents indicated that responsibility for risk management lies with the board of directors (versus 59% for combined responses this year), these results suggest an increasing trend toward vesting responsibility at the highest level in the organization.

Similar to our previous risk survey, the composite view of financial institutions indicated a variety of organizational approaches to risk oversight (Figure 17). The current landscape reflects a continued preference for centralized risk management functions (43%) or a combination of centralized and decentralized functions (20%). Of the 37% who indicated that they employ a decentralized approach to risk management, 20% were organized by risk type, 13% by business unit and 4% by region or geographic location.

As we outlined in our regional observations above, the preference for one organizational form of risk management over another varies geographically with European and South American firms indicating a clear preference for the centralized approach and firms in North America and Asia-Pacific showed a greater variety of approaches. Similarly, when looking at responses by firm size (Figure 18), there was a difference between smaller and larger firms, with a majority of the smaller firms preferring the centralized approach and a much greater mix of approaches employed at larger firms. This distinction is consistent with the complexities of managing larger and globally distributed organizations. The demand for enterprise-

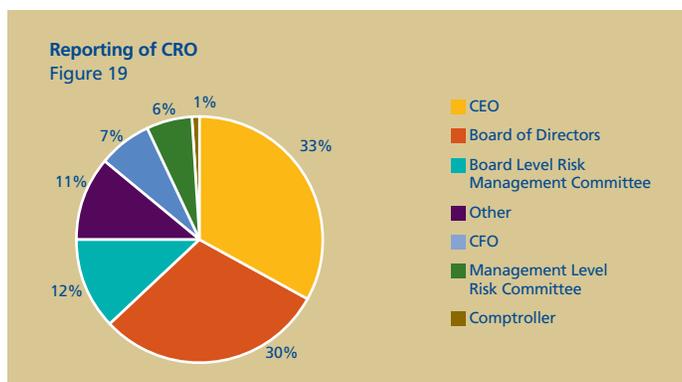




wide risk assessment and reporting may be an underlying factor in the continued interest in centralized oversight. It is not surprising however, that a variety of approaches to risk management play a role in organizations given the broad menu of risks facing financial institutions. In fact, the results support our observations of a broader trend in financial services in which a centralized policy-setting body, most often a risk management committee, establishes the risk management policies and limits that are implemented by the business units. Hybrids, or combination approaches such as this, are increasingly gaining traction as organizations struggle to balance the need for an integrated view of their risks across the enterprise with the flexibility required by the business units to respond quickly to changing market conditions.

Continued Evolution of the Chief Risk Officer

The number of organizations with a Chief Risk Officer (CRO) continues to increase, with 81% reporting that they have a CRO, versus 65% in our 2002 survey. For organizations employing a CRO, we noted a trend in elevated reporting lines as 33% of respondents indicated that the CRO reported to the CEO, 30% to the board of directors, and 12% to a board level risk committee (Figure 19). Compared to our previous survey where two thirds (66%) of respondents indicated a reporting line to the CEO or the board of directors, our current results (75%) appear even more pronounced in that direction.



The role played by the CRO continues to vary greatly in each institution, with the position including a mixed roster of responsibilities. While the majority of respondents indicated that they had a CRO or equivalent position, there was a range of key responsibilities attributed to the role. Each institution's risk appetite and culture influences the job description of the CRO, and therefore it is not unusual to have some variation in the distribution of duties among the respondents. The results of this year's survey are consistent with those from 2002 in terms of primary responsibilities assigned to the CRO or independent risk oversight function:

- Risk analytics and reporting (85% considered primary responsibility)
- Developing controls, policies and monitoring compliance (79%)
- Monitoring of risk exposure versus limits (74%)
- Independent verification of risk methodologies (70%)

The Convergence of Risk Oversight and Compliance

While regulation of the financial services industry is hardly a new topic, the introduction of Sarbanes-Oxley and similar legislation around the world adds yet another layer of regulation, and we added specific questions to address it in this year's survey. In reaction to the increasing compliance demands for risk and control information, many in the financial services marketplace are viewing the risk oversight function as a clearinghouse for compliance and risk management related initiatives such as Sarbanes-Oxley, Basel II, ERM, operational risk management and other compliance requirements that focus on internal controls. At the time of the survey, more than 60% of the respondents indicated the need to comply with Sarbanes-Oxley, and our results support the notion that organizations are attempting to gain efficiencies by addressing ERM and Sarbanes-Oxley together. In our current survey, we asked these respondents whether they were attempting to integrate their ERM program with Sarbanes-Oxley compliance. Among the respondents indicating both initiatives ongoing within their organizations, 29% answered that their programs were "very integrated" and 52% were "somewhat integrated." Less than one-fifth (19%) indicated that these initiatives were being managed separately with no coordination.

Regulatory and Economic Capital

The development of more sophisticated capital calculation methodologies continues due to both business and regulatory drivers — primarily Basel II. With the approaching implementation date of Basel II, organizations are increasingly turning their attention and resources toward developing the credit and operational risk capabilities needed to meet these new requirements.

Regulatory Capital and Basel II Framework

Responding to a number of outstanding issues relating to the previous release of their proposed set of regulatory capital proposals (the New Basel Capital Accord), the BIS Basel Committee on Banking Supervision released the final version of the Basel II Framework in late June 2004. The Basel II Framework allows for a more sophisticated and risk-sensitive framework for the calculation of regulatory capital for credit, market, and operational risks. Although the final version of the Basel II Framework does provide for an additional year of parallel calculation of Basel I and Basel II regulatory capital (through the end of 2007), the implementation target date remains the same as that stipulated in the previous New Accord draft.

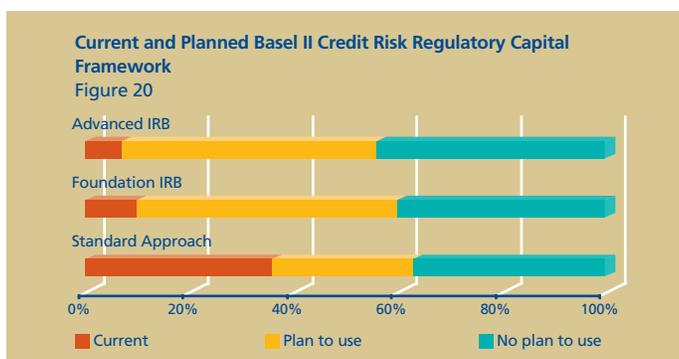
Credit Risk

The Internal Ratings Based approaches (i.e., Foundation and Advanced IRB) remain the predominant methods that respondents plan to use for their credit risk regulatory capital framework (Figure 20). A small minority of respondents consider their current capabilities adequate to implement IRB Approaches (10% of

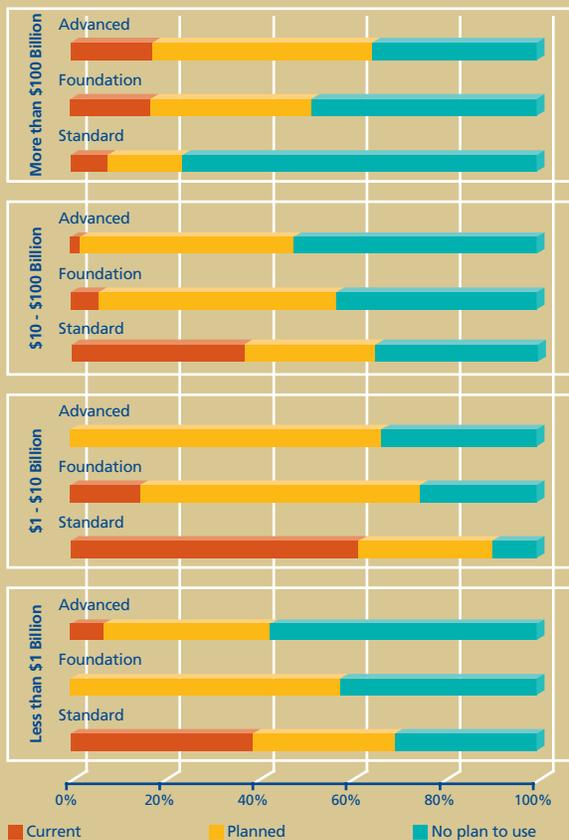
respondents stated that they are currently Foundation IRB capable, and 7% consider themselves to be AIRB ready). Based on current capabilities and stated plans, we believe that Basel II related activities are expected to continue to gather momentum within the credit risk functions of large internationally active Banks.

Relative to our prior survey, there has been a shift in the proportion of respondents who plan to use AIRB as their target state credit risk approach. In 2002, roughly 55% of respondents planned on implementing AIRB compared to 49% in the current survey. This decline is accompanied by a significant increase in the number of respondents planning on implementing Foundation IRB (from 22% in 2002 survey to 50% in the current survey). These results may be driven by a number of factors. The number of U.S. banks planning to implement AIRB has dropped since the Federal Reserve limited the scope of Basel II to the largest banks and introduced a two-tiered approach for adopting the Basel II Framework based on bank size and level of international activities. In addition, continuing industry consolidation driven by mega-mergers of large banks is reducing the number of large institutions. Lastly, it may be possible that a number of banking institutions have a better appreciation now of the complexities and investment required to implement AIRB. Overall, however, it is clear that most respondents plan to adopt more risk sensitive approaches – a major objective and benefit of the Basel II Framework.

When viewed by firm size (see Figure 21 on the following page), our survey results indicate patterns that are expected, with smaller firms generally less advanced currently and favoring adoption of Foundation IRB over AIRB in the future. For the largest firms, preference for AIRB is greater than Foundation IRB, the only group where this is the case. In addition, the largest firms were also the group indicating no plans to use the Standard Approach, whereas



Current and Planned Basel II Credit Risk Regulatory Capital Framework by Firm Size
Figure 21

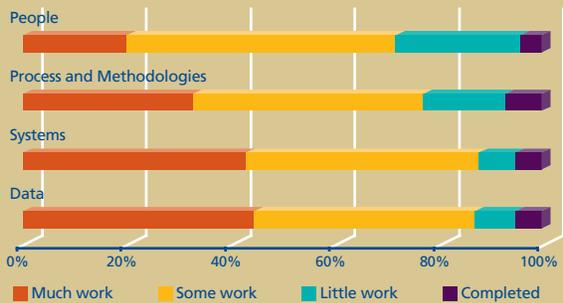


the smaller firms were generally more mixed in planned approach.

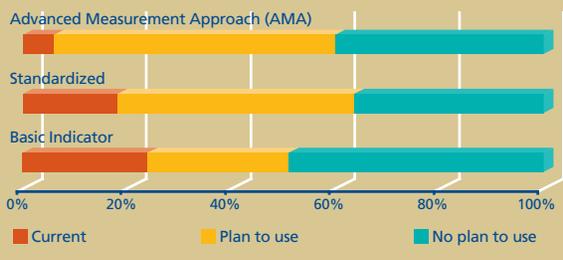
From an implementation perspective the survey results underscore the fact that the Basel II Framework places tremendous importance on data (i.e., availability, granularity, and validity) and system infrastructure (Figure 22). Significant numbers of respondents report that more progress is needed around data and system issues. In our view, the data related challenges are not entirely unexpected given the extensive M&A and consolidation activity within the banking industry over the last two decades. A myriad of disparate legacy systems and data infrastructure continue to exist at most large banks where integration-related interim solutions and tactical fixes have become institutionalized. Basel II data requirements are exposing the limitations of such solutions.

The emphasis on data and systems notwithstanding, there appears to be a basic understanding on the part of respondents that process refinements and methodology development are inherently required in support of Basel II compliance efforts. In addition to extensive reliance on data, the IRB Approach has considerable process-oriented qualification requirements (e.g., risk rating processes, underwriting, credit administration, credit review and control, collateral management, etc.). In many instances, gap assessments vis-à-vis qualification standards and implementation requirements are forcing banks to modify policies and procedures,

Implementation Progress on Basel II Credit Risk Framework
Figure 22



Current and Planned Basel II Operational Risk Regulatory Capital Framework
Figure 23



change credit and documentation processes, and review governance and control structures.

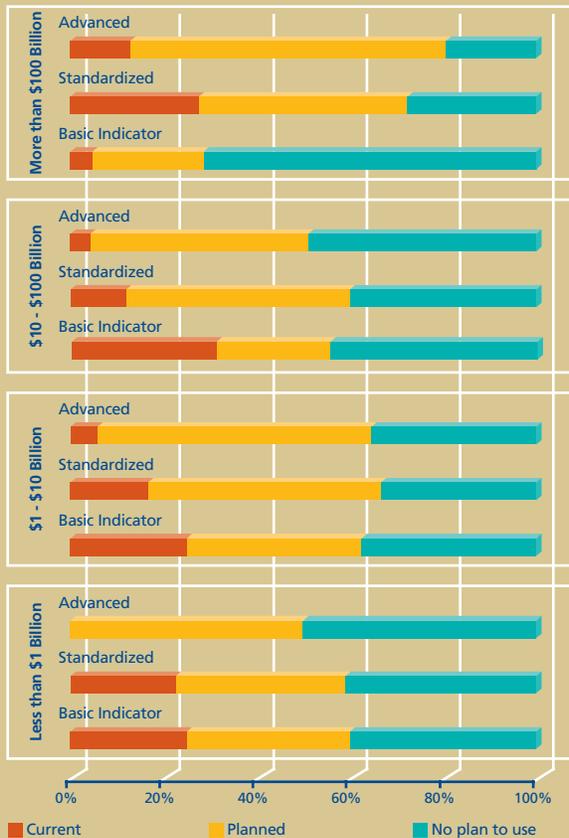
Operational Risk

As Figure 23 shows, a majority of respondents (54%) plan to implement the most sophisticated operational risk approach available in the Basel II Framework - the Advanced Measurement Approach (AMA). Similar to credit risk results, only a small minority believe they are in a position to currently comply with the AMA requirements (6%) or with the intermediate Standardized Approach (18%). Consistent with our expectation, operational risk measurement is still widely considered a much more immature field than credit risk measurement, perhaps implying that relatively more work needs to be done in the area of operational risk than credit risk.

As with the discussion on credit risk capital, our survey results showed a pattern where larger firms indicated a preference for the more sophisticated approaches to calculating operational risk capital (see Figure 24 on the following page). A clear majority of the largest firms plan to use AMA, whereas the mid-sized firms (\$1-\$10 Billion and \$10-\$100 Billion) showed a greater preference for the Standardized Approach. The smallest firms preferred the Basic Indicator Approach. Overall, the results viewed by size of firm align with expectations given the scope and complexity of Basel II.

Respondents' concerns regarding operational risk measurement issues are distributed fairly evenly across a host of issues, as seen in Figure 25 on the following page. A majority of respondents indicate that quantitative metrics and associated data acquisition issues are of major concern to them. In our view, this response emphasizes the fact that the firms feel less confident in their ability to implement AMA due to issues with availability and analysis of internal loss data

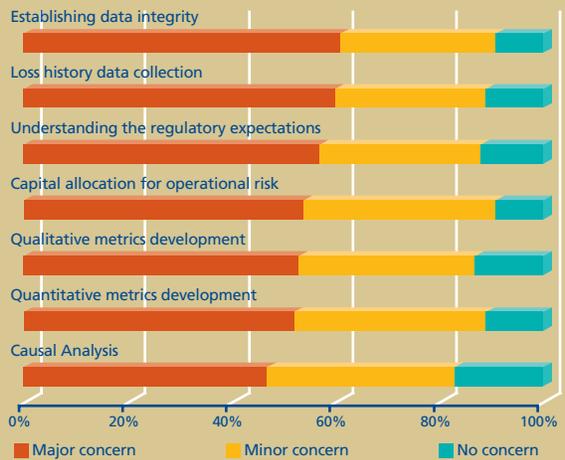
Current and Planned Basel II Operational Risk Regulatory Capital Framework by Firm Size
Figure 24



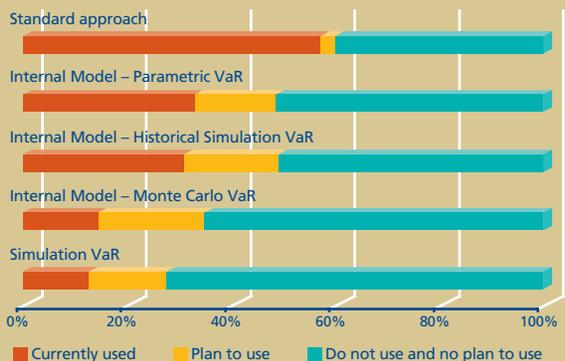
(or lack thereof) and key risk indicators that are aligned in a Basel II Framework fashion (i.e., across defined Basel business lines and loss event categories). The Basel II Framework has provided specific guidance on acceptable approaches for an operational risk framework with data, metrics, KRIs, self assessments and perhaps causal analysis as key components.

The Basel II Framework is much less prescriptive with respect to operational risk AMA requirements relative to those for credit risk AIRB. Although this allows banks to be more flexible and unique in their respective approach for AMA compliance, it also may not provide sufficient guidance with respect to these requirements. Given that formalized operational risk measurement and management is still in a stage of infancy in most banks, there appears to be a lack of clarity with respect to the tactical aspects of Basel II requirements for operational risk AMA. Our survey results support this conclusion as 57% of respondents identified understanding regulatory expectations as a “major concern,” while other quantitative issues such as “loss history data” (60%), “data integrity” (61%), and “capital allocation” (54%) were also viewed as critical issues.

Implementation Progress on Basel II Operational Risk Framework
Figure 25



Current and Planned Approaches to Calculating Market Risk Regulatory Capital
Figure 26



Market Risk

Survey results pertaining to market risk suggest that most respondents currently use the Standard Approach to measuring their regulatory capital (Figure 26). Given the relative maturity of the market risk measurement area, however, a significant number of respondents already have internal capabilities for measuring market risk on a VaR basis (primarily through a parametric VaR or a simulated historical VaR measure), or are planning to develop these capabilities. Although some respondents currently feel they have the capability of using a pure simulated VaR approach or are planning to use this sophisticated approach, the clear majority of respondents (72%) do not intend on using these means of market risk measurement.

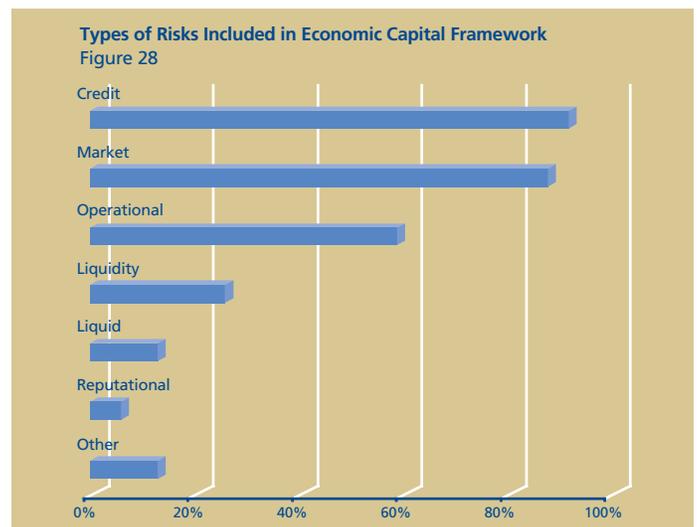
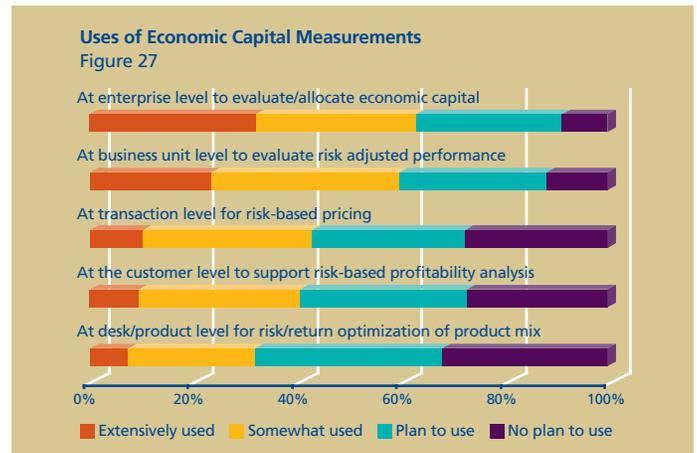
Economic Capital

Many elements of economic capital theory and the associated methodologies form the underpinnings of the Basel II Framework. Several financial institutions have implemented internal economic capital models of varying sophistication and granularity over the last 10 years. Our survey results suggest that the sophistication and level of use of these economic capital methodologies vary considerably across respondents (Figure 27).

For the most part, respondents believe they have the ability to calculate economic capital at an enterprise-wide level. Respondents also appear to understand the role of enterprise-wide economic capital results and its use for capital allocation, as an overwhelming 91% use or plan to use economic capital for these purposes.

Our results also show that firms seem to understand the benefits of an economic capital model that can support more granular or transaction level assessment. While only one third of the respondents currently use economic capital model results for product-based decisioning, roughly the same proportion plan to implement this ability in the future. Similarly, 32% and 30% of respondents, respectively, intend to use economic capital based results for customer level and transaction level profitability/pricing.

Another interesting aspect of economic capital frameworks is the types of risks that are included. As Figure 28 shows, almost all respondents who calculate economic capital include credit and market risks within their frameworks. A majority of respondents include operational risk. Less than one-third of respondents calculating economic capital include liquidity, legal and reputational risk in their frameworks. These observations were consistent across both geographic regions and firm size.



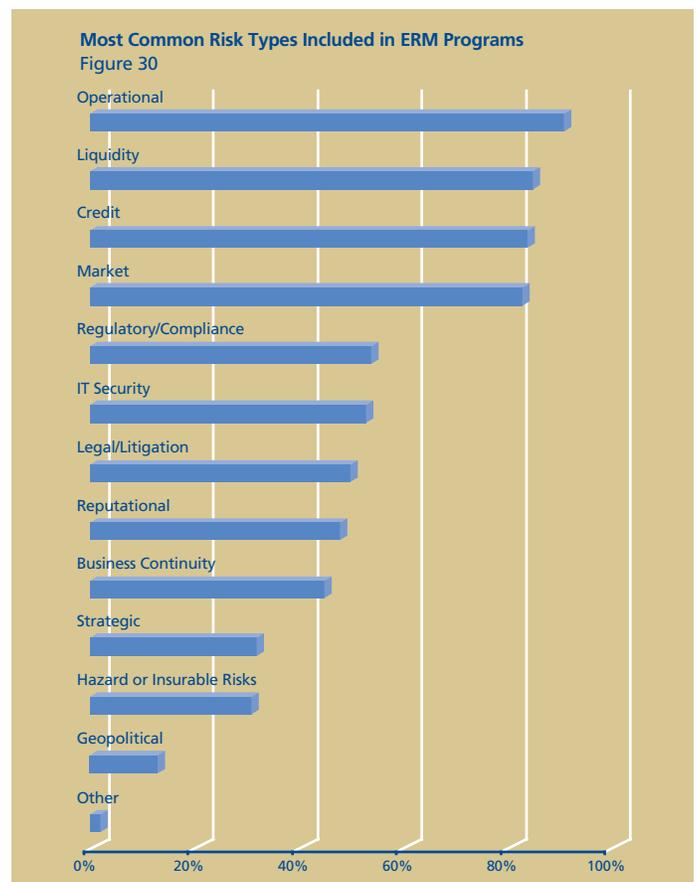
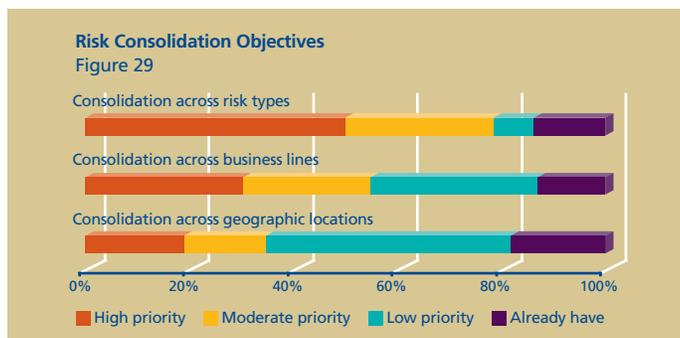
Enterprise Risk Management

Enterprise Risk Management continues to generate interest among risk managers, executives, the board of directors and shareholders. Given the core role of risk management in financial institutions, it seems intuitive that ERM might be the final “destination” for companies wanting to demonstrate advanced capabilities. For all the hype, however, ERM continues to be an elusive concept that varies widely in definition and implementation, and reaching full maturity may take several years.

Risk Consolidation

Regarding the question of what type of risk consolidation is desired in an ERM framework (Figure 29), respondents’ objectives aligned very closely with our 2002 survey results with 58% indicating that consolidation of risk types was a high priority (57% in 2002), 35% for consolidation across business lines (39% in 2002), and 23% for consolidation across geographic regions (19% in 2002). Overall, it appears that the objectives and priorities of ERM in terms of consolidating different types of risk information at our survey institutions have remained largely unchanged over the past couple of years.

In terms of the breadth of risks covered within an ERM program, the participants in our survey indicated that operational (91%), liquidity (85%), credit (84%) and market (83%) are the most frequently included risk types (Figure 30). This result aligns well with the emphasis being currently placed on these risk types by the



Basel II Framework as well as the more advanced risk measurement techniques available for these risks. The results also indicate that hazard risks continue to be managed separately for the most part with only a third (31%) of participants including them in their ERM programs.

ERM Implementation Priorities

In evaluating the implementation priorities of respondents’ ERM programs, we continue to note a strong but somewhat mixed emphasis on integration of economic capital frameworks with ERM (see Table 1). Our results show a fairly even distribution of respondents indicated that “firm-wide economic capital allocation and risk-based distribution of economic capital to business units” was a high priority (32%) versus medium (28%) or low (30%). The relatively even split among respondents was also similar to our previous survey in which 30% of participants indicated this objective was a high priority, 30% medium and 26% low. When combined with the economic capital discussion in Section Two and the risk consolidation data above, it appears that firms continue to show strong interest in the practical uses of ERM, especially as it relates to economic capital.

Another notable result from this year’s survey is the emphasis respondent’s placed on “integration of risk management and various regulatory initiatives.” Survey respondents indicated that this objective was a high (48%) or medium (24%) priority, and this result aligns well with our discussion in Section 1 on integration of ERM with compliance initiatives.

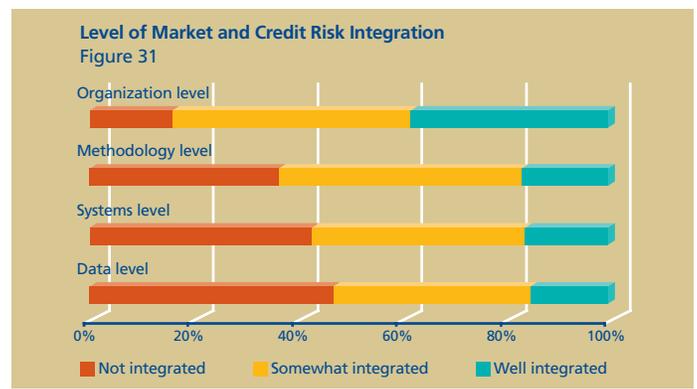
In terms of changing interest levels, our survey results this year suggest a slight decrease (from high to medium priority) in interest for using ERM to achieve “consistent risk-based pricing across the firm.” In our previous survey, 36% of respondents thought this objective was a high priority, 32% medium and 25% low. This time around, only 25% of participants thought this objective was a high priority, with 36% listing it as a medium priority and 30% as low. The general shift from high to medium priority may be due to factors including refinement of ERM objectives within organizations toward an emphasis on practical application.

Table 1: Current ERM Investment Priorities

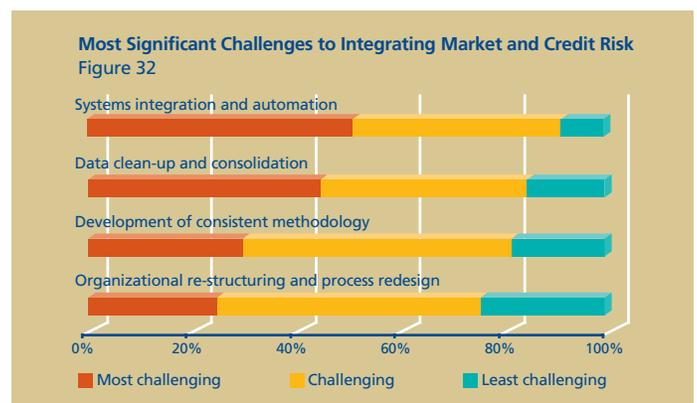
High Priority	Medium Priority	Low Priority
<ul style="list-style-type: none"> • Integration of risk management and various regulatory initiatives • Risk Reporting • Risk Management Governance Structure • Firm-wide economic capital allocation and risk-based distribution of economic capital to business units 	<ul style="list-style-type: none"> • Consistent risk-based pricing across the firm • Risk-adjusted performance analysis of business lines • Integrating market and credit risk 	<ul style="list-style-type: none"> • Risk adjusted shareholder value management • Integrating major risk types into a single organizational wide view • Integrating market, credit and operational risk

Market and Credit Risk Integration

As in our last survey, we asked participants to rate the level of integration between their market and credit risk management programs as an indicator for progress on risk consolidation. The results this time around show some progress has been made over the past two years with a higher proportion of respondents answering that market and credit risk infrastructure at the organizational (38%), methodology (15%), systems (16%) and data (15%) levels is considered “well integrated” (Figure 31). Similar to previous results, however, a majority of participants indicated that their systems and data continue to be an integration challenge with 43% and 47% believing no level of integration has been achieved while the most popular answer for methodology was “somewhat integrated.”



Continuing on the theme of market and credit risk integration, our survey asked respondents to rate their most significant implementation challenges. Not surprisingly, “systems integration and automation” continues its reign as the most challenging aspect of integrating market and credit risk capabilities with a majority of respondents (51%) choosing that answer (Figure 32). Slightly less than half of respondents (45%) indicated that “data clean-up and consolidation” was the most challenging aspect of integration. These results show that technology and data issues continue to pose the greatest barrier to achieving a consistent level of risk consolidation across the enterprise. Extending beyond market and credit risk to include other risk types will entail even greater challenges, making achievement of ERM objectives a major undertaking at most financial institutions.



Credit Risk Management

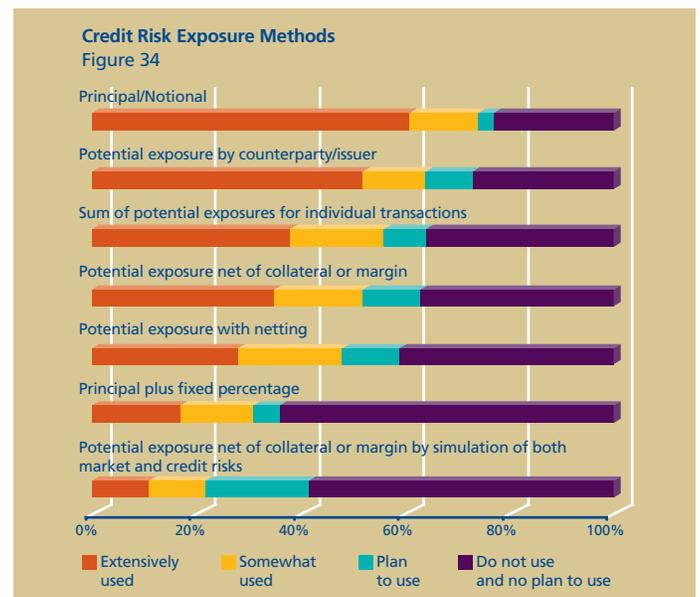
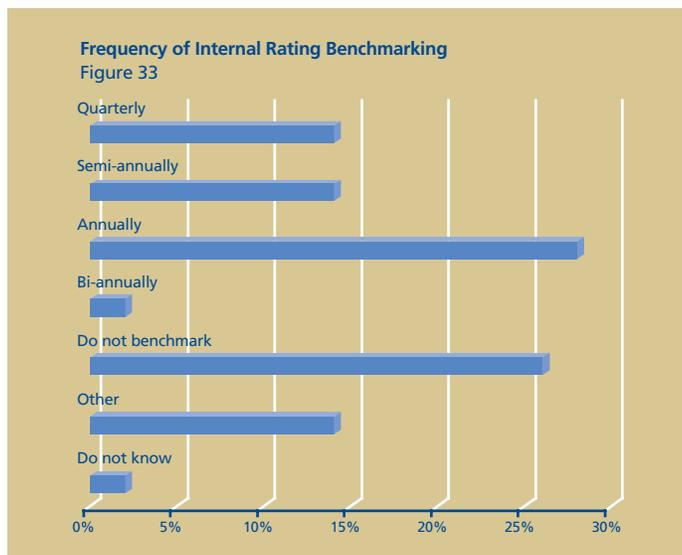
Credit risk management is an area that has received significant attention at financial institutions since our last survey in 2002. Most organizations are constantly looking to place available capital in the areas with the greatest return per unit of risk. For financial institutions with commercial and/or consumer credit risk, many have realized that improvements in credit infrastructure are an excellent area for investment that can improve bottom line results.

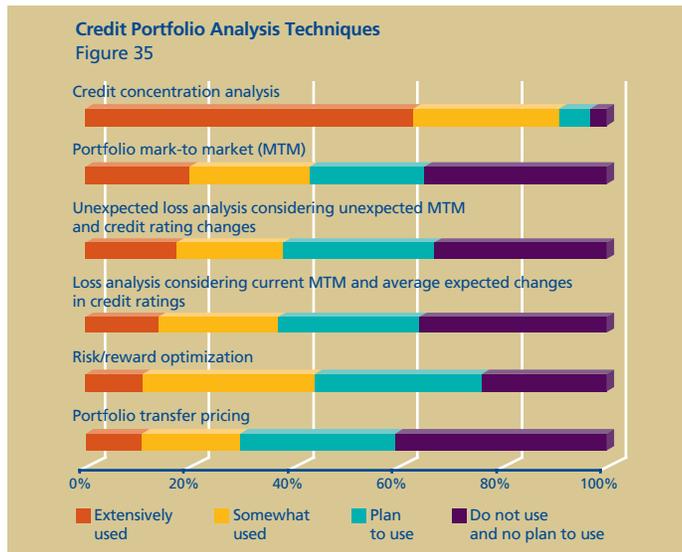
Credit Risk Analysis

The responses to the current survey as compared to those from 2002 clearly demonstrate that financial institutions, in both the commercial and consumer sectors, have devoted increased efforts to credit risk analysis. From basic underwriting to advanced stress testing, these organizations have improved capabilities and utilize them to manage the portfolio of credit risks on a much more dynamic basis. 72% of respondents conduct regular testing of their internal rankings, compared to 54% in 2002 (Figure 33). Our experience with clients suggests that this result is not a function of

increased reliance on external rating agencies, but instead is based more on a belief that increased investment in internal ratings and monitoring capabilities pays a return because the internal ratings are more useful for their needs.

Credit risk exposure methods continue to evolve in this year's survey with respondents displaying preferences for a wide array of tools and methodologies (Figure 34). As with other types of risk exposure, the most basic tools are more frequently employed. 61% and 52% of respondents answered that "principal/notional" and "potential





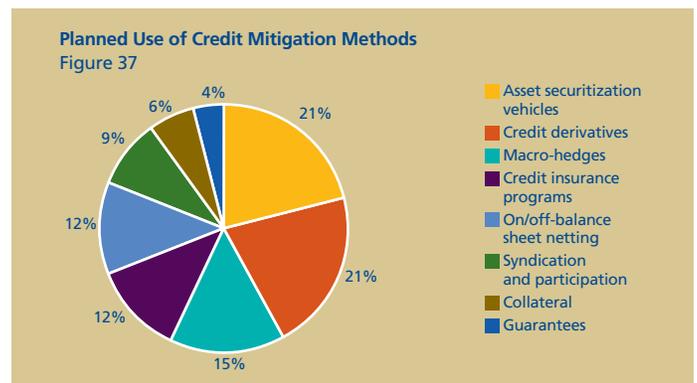
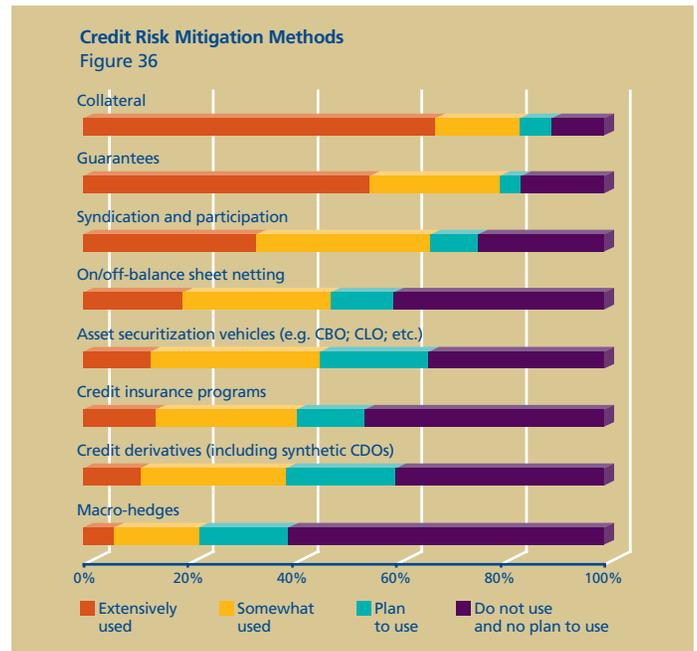
exposure by counterparty/issuer” were their primary methods of exposure analysis respectively. A slight majority use summation of individual transaction exposures (56% use as primary or secondary methodology) and “potential exposure net of collateral margin” (52%). A majority of respondents do not use or plan to use “principal plus fixed percentage” or advanced simulation techniques.

In terms of analyses used for portfolio management, the evidence supporting increased investment in credit risk capabilities continues to be apparent (Figure 35). While credit concentration analysis is still the leading choice (91% use it extensively or somewhat, compared to 96% in 2002) we note a slight increase in the use of tools such as portfolio transfer pricing (30% versus 26% in 2002). At the other end of the spectrum, we noted that 71% of respondents this year indicated they currently do not use “portfolio transfer pricing,” but that 30% plan to in the future (versus 20% in 2002). For the other tools included in our survey, we found that participants indicated a similar level of current use as compared to 2002, and some increase in levels of planned use.

Credit Risk Management and Mitigation

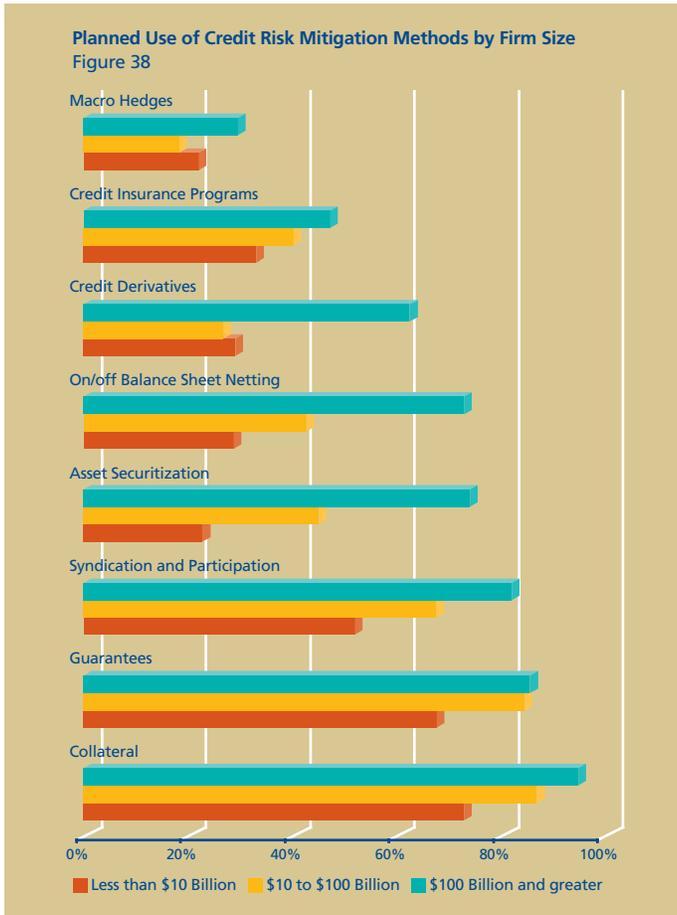
Our survey results from this year reflect an evolving approach to credit risk management and mitigation. The broad picture presented by respondents is one where basic tools and methods are still employed, but an increasingly diverse set of alternative and more sophisticated approaches are being tried. In addition, the overall importance of netting and margining has increased somewhat, with 48% of the respondents indicating they utilize on/off balance sheet netting versus 40% in 2002. The use or planned use of credit insurance programs has also increased from 37% in 2002 to 41% today. These credit risk mitigation techniques are supplementing what may be viewed as more basic mitigation techniques in the form of credit syndication and participations, which fell in use from 73% to 66%, and collateral and guarantees (Figure 36).

Given the rapid growth in the credit derivatives market over the past few years, it is important to note how our respondents view these tools and their planned usage. While our survey respondents



indicated an overall inclination toward conventional credit mitigation approaches, more respondents, especially among larger firms, are using or planning to use credit derivatives and other more sophisticated credit mitigation techniques. Figure 37 highlights overall respondents’ planned usage of credit mitigation tools and shows that “credit derivatives” and “asset securitization vehicles” are the top methods firms are planning to use.

Given the economic growth in the securitized bond and loan market and credit derivatives in the past two years, it is important to look more closely at these credit risk mitigation methods and the extent to which use varies by firm size. While the use of securitization and credit derivatives has only grown slightly in our overall results as compared to 2002, the usage pattern varies substantially by firm size. Figure 38, on the following page, highlights how large the disparity is between large and smaller firms in terms of credit risk mitigation tools. While all firms tended to use traditional mitigation tools including collateral, guarantees, and syndication and participation, fewer firms under \$100 billion in size use more sophisticated tools such as credit derivatives, asset securitization and on/off balance sheet netting. The use of these three methods with respondents having greater than \$100 billion in assets is more than double those with less than \$100 billion. Still, even for organizations with less than



\$10 billion in assets, securitizations and credit derivatives remain the leading type they plan to add to their available credit mitigation methods in the future with 25% of these firms planning to increase use of these tools compared to 14% for all other methods.

The methods and technologies used to track credit derivatives have changed somewhat since our last survey with many respondents reporting an increase in the use of stand-alone spreadsheet solutions (23% versus 14% in 2002). This increase may be related to the increased use of credit derivatives such as credit default swaps and total return swaps. As in 2002, slightly more than one quarter of respondents have incorporated credit derivatives into their existing risk management systems while similar levels of usage for third-party and stand-alone credit systems were noted.

Planned Investments in Credit Risk Capabilities

New to our survey this year are questions inquiring about investment priorities over the next 12-24 months. We surveyed companies about planned investment levels in both commercial and consumer credit risk management capabilities. In the commercial credit area (see Table 2), the level of planned investment in credit capabilities is quite strong with an average of 62% of respondents planning a high or moderate level of investment. The most critical areas would appear to be “active portfolio management” (71% plan high or moderate investment), Basel II (70%), reporting and management review of credit decisions (70%) and consistent data /corporate

aggregation (70%). Client profitability and integration with market risk were stated as areas of lower priority for significant investment. It is interesting to note that these top areas would seem to point to increased sophistication, but also a need to attend to basic issues around credit data, which would be required to properly use more sophisticated credit techniques and to meet the advanced requirements of Basel II.

Table 2: Planned Investment in Commercial Credit Risk Capabilities

Capability	High or Moderate Investment
Active credit portfolio management	71%
Requirements for Basel II	70%
Reporting and management review of credit decisions	70%
Consistency of credit data and ability to aggregate at a corporate level	70%
More sophisticated credit underwriting standards and credit process	64%
Economic capital allocation	60%
Client profitability measures	60%
Global consistency of underwriting standards and credit process	47%
Linkage of credit to marketing	43%

In the consumer credit area, the level of intended investment remains strong with a majority of respondents planning a high or moderate level of investment in the capabilities outlined in Table 3 below. The area receiving the most attention is “global consistency of underwriting processes and standards” where 36% of respondents plan a high level of investment, and 27% see moderate investments in the near future. A focus on movement toward risk-based collections and the usage of scoring and collections results in customer profitability measures are also important as a majority of respondents plan moderate or high levels of investment in these capabilities. These areas of top investment seem to make sense in a marketplace where hyper-growth has taken place due to low interest rates and competitive pressures leading to several recent consumer-focused mergers. As large volume growth and mergers occur, consistency of processes and underwriting becomes critical to gaining efficiency and controlling risk. Moreover, as competition increases, measures of customer profitability and high-impact collections activities can become key differentiators.

Table 3: Planned Investment in Consumer Credit Risk Capabilities

Capability	High or Moderate Investment
Global consistency of underwriting standards and credit process	63%
Linkage of scoring and collections results to marketing/origination and measure of customer profitability	55%
Improvement in collections capabilities; movement to risk-based collections	54%
Reporting and management review of credit decisions	52%
Client profitability measures	52%
Consistency of credit data and ability to aggregate at a corporate level	50%
More sophisticated application and behavior scoring	46%

Market Risk and Asset/Liability Management

The measurement of market risk and the integrated management of assets and liabilities continue to evolve, albeit at a slower pace than for credit and operational risk. Much of this can be attributed to progress already made during the 1990s when value-at-risk became the standard approach adopted by large financial institutions. Firms are still working to enhance their market risk capabilities by adding new products to their methodologies and implementing more advanced asset/liability risk management techniques.

Market Value-at-Risk (VaR)

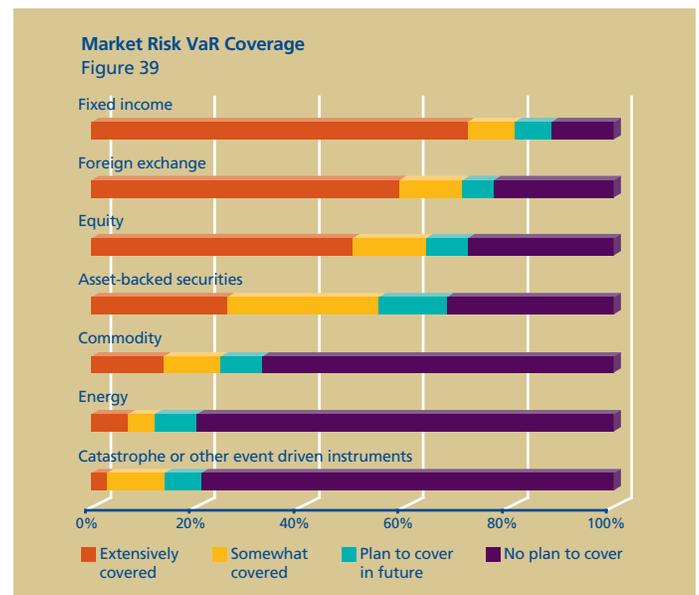
Market risk management methodology and techniques are fairly well developed within many financial institutions. A series of seminal events in the mid through late 1990s have helped to shape the market risk management landscape as we see it today. The introduction of the Basel Market Risk Amendment in 1996 codified regulatory expectations, and helped propel the implementation of internal models, illustrated by the development of Value at Risk methodologies initiated by the larger banks through the mid through late 1990s.

We continue to see the trend of increasing sophistication in market risk management frameworks across the banking landscape. With a few notable exceptions, there is continued development and implementation of these methodologies, as they are applied to new asset classes, new market and industry sectors, and to new players within the banking industry. These trends are supported by our findings.

Coverage of VaR Analytics Across Asset Classes

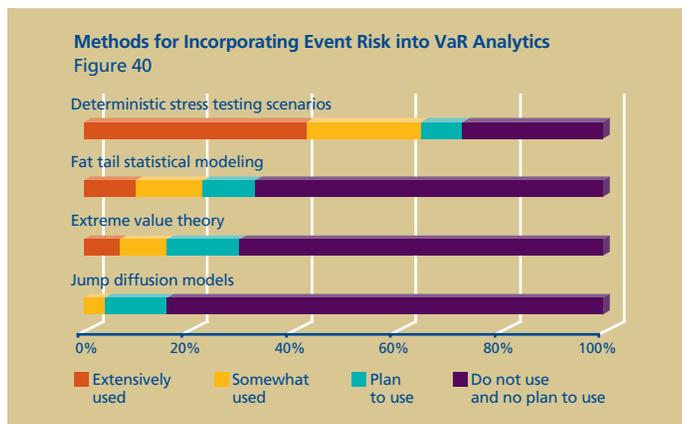
Consistent with many institutions' initial modeling of plain vanilla instruments within VaR analytics, it comes as no surprise that fixed income and foreign-currency are the assets most broadly covered among survey participants (Figure 39). This is consistent with our last survey's results in 2002. Our findings reveal substantial variation among asset classes with respect to the coverage of more structured products. This may be due in part to the fact that not all survey members actively trade these products globally. ABS and equities

products are covered by over half the participants. Coverage of ABS products within VaR portfolios recorded the largest increase, relative to all other asset classes (from 48% to 55%, relative to 2002 survey results). Less than a quarter of the companies currently cover commodities, energy, and catastrophe instruments within their VaR portfolios. Given the recent attention among some financial institutions to the energy industry, it will be interesting to see if VaR coverage of energy products increases in the next several years.



Incorporation of Event Risk in VaR

The incorporation of event risk into VaR calculations generally increased from 2002 to 2004. Deterministic stress testing scenarios (65%) remain the most popular and widely used method (Figure 40). More participants from 2002 are using Extreme Value Theory (doubling from 8% to 16%) and fat-tailed statistical models (from 16% to 23%), however responses indicating future plans to incorporate these methods were less than half of what they were in the previous survey. This decline may be due to a variety of reasons such as a shift in the population from planning to actual implementation, potential loss of interest in these methods or reluctance to initiate new projects at this time. The drop in institutions planning to use jump diffusion models may in part be due to institutions downsizing their trading activity in energy and commodity markets, where these models are currently more commonly used. This interpretation would be consistent with observations made on asset coverage within VaR models.

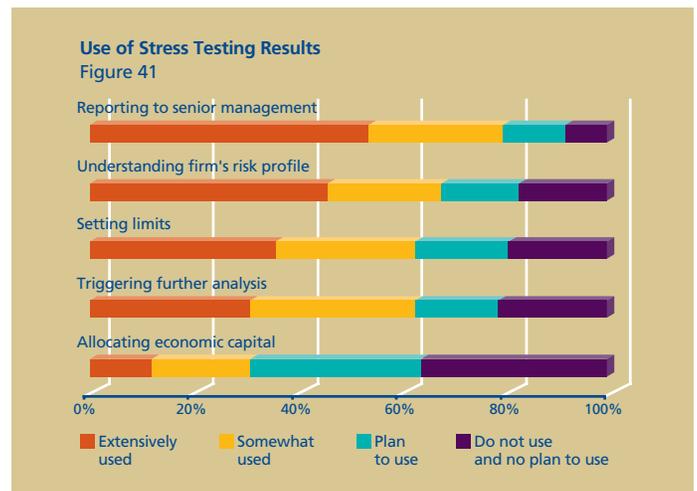


Update of Volatility Model Parameters

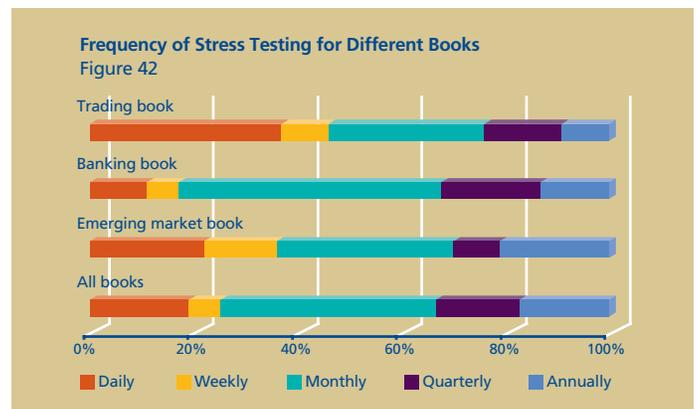
Participants seem to be updating their models on a more frequent basis since our last survey. Firms updating volatility data sets on a weekly basis increased from 10% to 15%. Firms with monthly updates have increased by 13% to 29%. Annual updates (8%) of market volatility models are now conducted by the smallest percentage of participants.

Stress Testing for Market Risk

The results of our earlier surveys and other industry surveys have indicated that the use of stress testing continues to be quite common among practitioners (Figure 41). When we asked the participants about how they use stress test analysis, the majority of respondents reported that they use it for reporting to senior management (80%), and for gaining an understanding of the firm's risk profile (68%). These results may be due to the more intuitive nature of stress test analysis rather than the somewhat more statistical Value-at-Risk measure. In addition, the proportion of respondents using stress test analysis to set limits and as a trigger for further analysis remains high (63% for both). A finding regarding potential trends is that the proportion of respondents planning to use stress tests to allocate economic capital increased from 23% to 33% since our last survey.



One notable difference from our 2002 survey was the stress testing frequency results (see Figure 42). Whereas the most frequently chosen response was previously to conduct stress testing on an annual basis, this year's responses indicate that monthly stress testing is now the most frequently chosen response (the trading book is the lone exception with 37% of respondents stress testing this book on a daily basis and 30% performing these procedures monthly). Stress testing of the emerging market book showed the greatest increase in frequency as the number of respondents who stress test this book on a daily basis has increased from 6% to 22%. This overall migration to higher stress testing frequency is also demonstrated in the increase in daily responses across all books (from 2% to 19%).

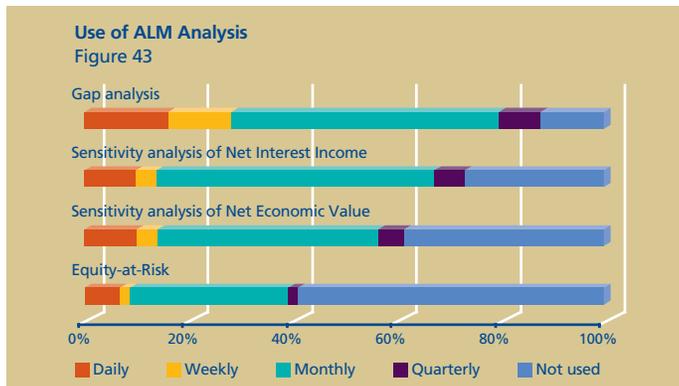


Asset/Liability Management (ALM)

We asked our participants about the types of ALM analyses they produce and how they plan to integrate ALM with market risk analysis. Nearly 80% of institutions surveyed have indicated some form of integrated measurement and management capabilities between assets, liabilities, and off-balance sheet positions. In addition, there continues to be an increasing trend in the use of simulation-based ALM systems within participant institutions.

Frequency of Analysis for ALM Reporting Purposes

This year's survey yielded results similar to the 2002 results. Gap analysis and Net Interest Income (NII) continue to be the most widely used analysis for ALM among survey participants (Figure 43). Of those who use these analyses, roughly half perform this on a monthly basis (gap analysis 51% and NII 54%). Equity-at-Risk continues to be the least widely used among the different types of analyses, with roughly 2 out of 5 institutions citing its use (i.e., approximately 60% do not use). Of those that use Equity-at-Risk analysis, there appears to have been a shift from other reporting frequencies to monthly, perhaps to some extent due to the computational run-time overhead associated with this analysis. The reason for the most commonly reported frequency of monthly may stem from the fact that most institutions conduct ALCO meetings requiring such analysis on a monthly basis.



ALM Integration for Measurement and Management

Roughly two out of three participants surveyed (65%) responded that they had at least a somewhat integrated risk management framework for their banking and trading book. 11% of respondents indicated no plans to integrate these two books. A very large proportion of participants (82%) have at least a somewhat integrated measurement and management capability among their assets, liabilities, and off-balance sheet positions. A relatively small percentage of respondents have no plans to integrate (4%). These results may be attributable to both advances in risk management technology capabilities (e.g., proliferation of enterprise wide risk management software systems), and both a direct and indirect effect of regulatory compliance (e.g., development of internal models, and Value-at-Risk methodologies).

Implementation of Forward-Looking Simulation Based ALM Systems

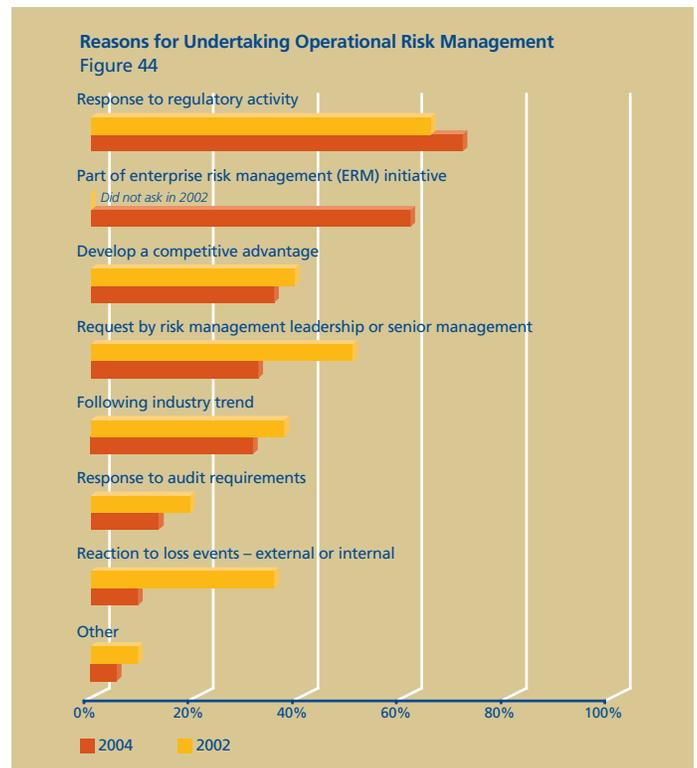
Relative to our last survey, essentially the same proportion of survey respondents have indicated they have already implemented a forward-looking simulation based ALM system. However, there appears to be some shift from those who previously did not have plans to implement a simulation system to those who are planning to implement one (17% and 42% this year, respectively, vs. 25% and 31% in 2002).

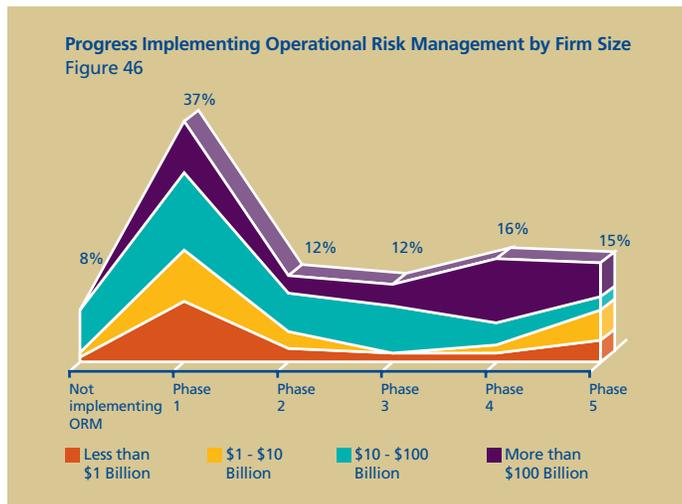
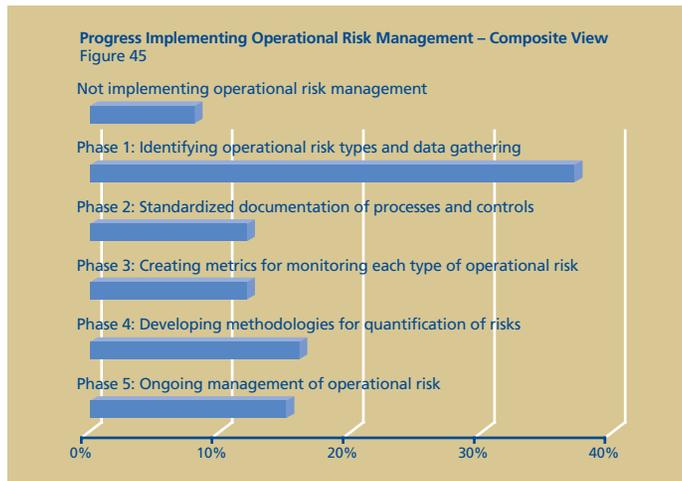
Operational Risk Management

As the effective date for Basel II implementation draws closer, financial institutions are turning more of their attention and resources toward operational risk management. Most institutions are still in the early phases of implementing an operational risk management capability, but most are planning for increased investment over the next two years. Our survey results indicate that some progress in operational risk management capabilities has been made since 2002, but considerable effort remains to meet the upcoming deadlines.

Drivers and Organization

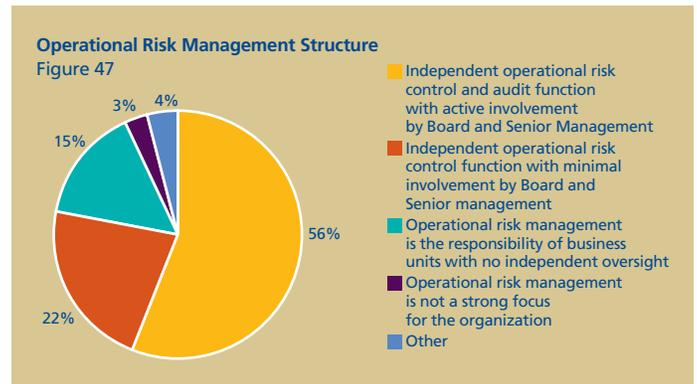
Survey participants provided a similar view of the rationale for pursuing operational risk management as in our last survey, with several notable exceptions (Figure 44). As with our previous results, responding to regulatory requirements was the most often cited reason for implementing operational risk management capabilities (71% versus 65% in 2002). Interestingly, as this percentage has increased, the number of firms indicating that a “request by risk management leadership or senior management” (32% versus 50% in 2002) or a “reaction to loss events” (9% versus 35% in 2002) has decreased. This suggests that the focus of implementing operational risk management has perhaps shifted from a voluntary undertaking to one that is more compliance driven. The other notable outcome is the linkage between ERM and operational risk management that 61% of respondents cited as a key reason for pursuing this initiative. We did not include this response option in our 2002 survey, but the linkage between ORM and ERM is becoming increasingly evident as our results show.





In terms of progress toward implementing operational risk management, participating firms showed advancement during the previous two years, but over a third (37%) answered that they are in the preliminary stage of implementation focused on identifying operational risk types and gathering data (Figure 45). From a composite view, our results also show an even distribution of firms in the remaining implementation phases, with slightly more companies indicating they have reached full implementation when compared to 2002.

As shown in Figure 46, when implementation progress is broken down by firm size, a slightly different perspective can be seen. As one would expect, the largest firms (e.g., greater than \$100 billion in assets) had a larger number of respondents answering that they had achieved Phase 4 or Phase 5 than the other asset classes. The responses from medium sized firms (between \$10 and \$100 billion in assets) show a larger proportion of firms in the intermediate phases of implementation (2 and 3), whereas the smallest firms (less than \$10 billion in assets) were primarily in Phase 1. One notable finding was that the largest number of firms not implementing ORM was found in the medium sized firms as opposed to the smaller firms, which is where one might expect to find this result.



In reviewing organizational trends implied by our survey results, we see a continued migration toward a centralized operational risk management model, with a clear majority (78%) of respondents choosing to organize their operational risk management using an “independent operational risk control and audit function” (Figure 47). The degree of involvement of senior management and the board varies, but a majority (56%) of respondents favor active involvement versus respondents who do not (22%). The other notable outcome was the decrease in respondents who described their operational risk approach as the “responsibility of business units.”

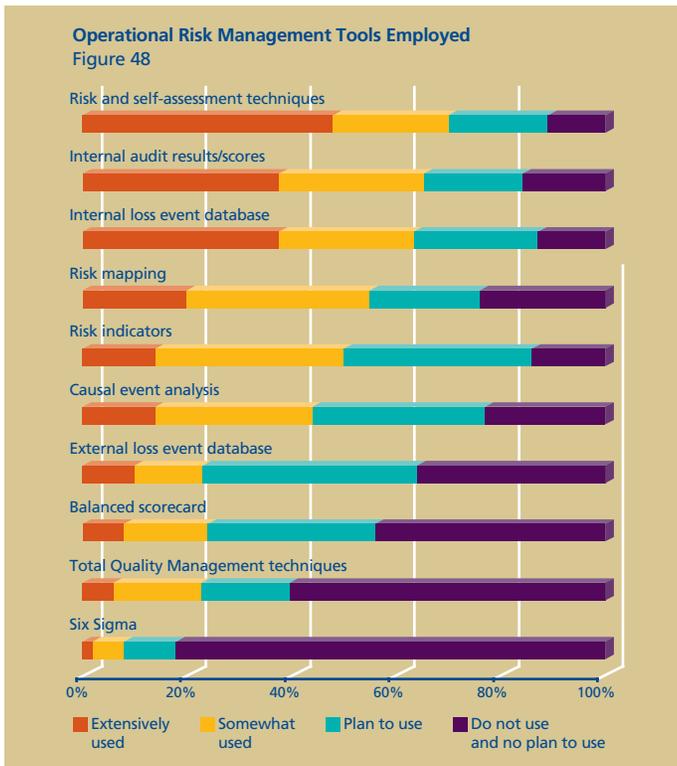
Focus and Techniques

The primary focus of respondents’ operational risk management programs has remained largely unchanged since our last survey in 2002. Percentages were changed somewhat, but the order of priorities remained the same with exception of “capital allocation,” which dropped from fourth to sixth position (Table 4). As with 2002, capital allocation was also cited most frequently by participants as the response receiving no focus by the organization. The results continue to support the notion that operational risk management is being viewed as a process and internal control improvement tool.

Table 4: Primary Focus of Operational Risk Management Program

Response	2004	2002
Compliance with internal controls	68%	78%
Best practices procedures	53%	50%
Cross-organizational / enterprise operational risk management	52%	49%
Quantification of risk – financial implications	49%	38%
Accountability / performance	33%	36%
Capital Allocation	31%	42%
Quantification of risk – non-financial implications	28%	22%

In terms of tools used in the implementation of operational risk management, our results are very similar to 2002, with some clearer indications (Figure 48). Risk and self-assessment, internal audit results/scores and internal loss event databases continue to be the most popular tools employed and we would consider them “tier 1” tools at this time in terms of their rate of adoption. In terms of second tier tools, risk mapping, risk indicators and causal event analysis were tools most frequently cited as “somewhat used” within respondent organizations. Risk indicators, in particular, had the second highest number of responses (36%)



indicating a plan to use the tool in the future. At the other end of the spectrum, balanced scorecards, total quality management techniques and Six-Sigma were all tools respondents indicated would not be extensively used in the future. Finally, external loss event databases are currently used by less than a quarter (23%) of respondents, but many plan to use these in the future (41%) indicating continued interest, likely due to Basel II programs. In comparison to 2002, the percentages given to each response vary, but the results are largely similar when viewed in these tiers. As the implementation deadline approaches for operational risk under Basel II, we expect to see even more clarity in responses to our next survey.

Operational Risk Management Systems

More than 95% of respondents believe that their current operational risk management systems fall short of the required capabilities in one or more areas (Figure 49). This overall result is in line with our previous survey, but varies depending on the specific area of functionality under consideration. Data gathering and reporting continue to be the areas of functionality where respondents feel the most comfortable with a majority of respondents indicating their systems were very capable or only needed "some" improvement. Scenario and model building and exposure calculations continue to be the most challenging areas of functionality with a majority of respondents indicating that their systems either did not have the required functionality or that much improvement was needed. On a more positive note, we did see significant improvements in the capabilities reported by respondents regarding these functional areas, indicating some progress is being made. With regard to scenario and model building, 34% of respondents thought their



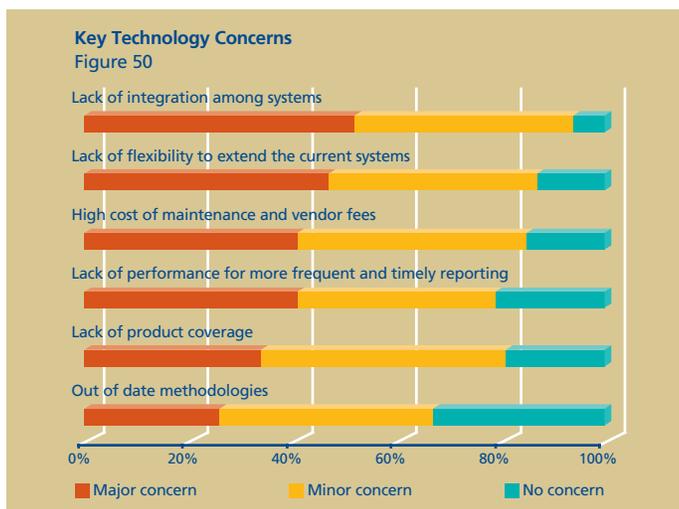
operational risk management system was either "very capable" or only needed "some" improvement, a meaningful increase from our last survey where only 22% of participants responded similarly. In the area of exposure calculation, the increase from our last survey is even more pronounced with 43% favorably evaluating their current system capabilities versus 26% in 2002. The overall results indicate measured progress toward improving system capabilities. We anticipate this trend to accelerate in the run-up to the effective date of the Basel II requirements.

In terms of resource allocation for operational risk management programs, we noted that respondents are generally anticipating more investment than in our previous survey. In terms of staff, a third (34%) of respondents plan no increase over current levels compared to 50% in 2002. 21% of respondents are planning increases between 0% and 10%, while 21% of respondents are planning significant increases of greater than 30%. Overall, the results suggest that companies are generally looking to augment their human resources dedicated to operational risk management.

As in our last survey, systems and technology continue to be a focal point of ongoing investment. Only a quarter (27%) of respondents indicated no plans to increase investment (38% in 2002), and this was approximately equal to the percentage of respondents (25%) indicating a greater than 30% increase in budget was planned (16% in 2002). Overall, 73% of respondents planned increases in system and technology budgets versus 62% in 2002. Firms participating in this year's survey also indicate a slight increase in external consulting costs with 48% of the respondents planning some increase (38% in 2002). This means that, as with our last survey, a majority of respondents are planning no increase in external consulting for the near term.

Risk Systems and Technology

Risk systems and the related infrastructure have continued to advance since our last survey in 2002. Changes in the pricing and design of hardware, the expansion of open source operating systems and applications and the ongoing increase in the use of advanced delivery mechanisms have continued to have a profound impact on the design and functionality of risk systems. Despite these advances, financial institutions still struggle with integration of their systems and platforms, many of which are commingled after large mergers or acquisitions. In addition, meeting the myriad of new regulatory requirements is a high priority among respondents.

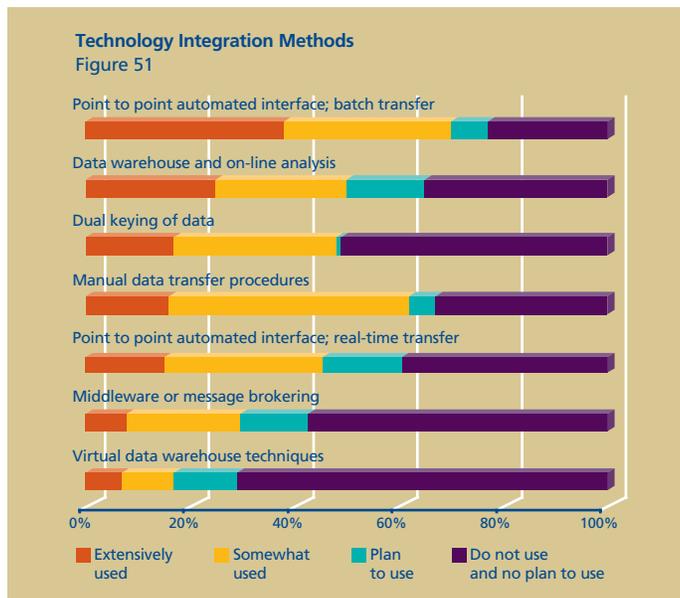


Key Technology Concerns

The most immediate observation from the 2004 results is the increased recognition of limitations and concerns across all the survey issues when compared to 2002. System integration continues to be the biggest challenge facing firms, but other issues also exist (Figure 50). Respondents also cited concerns with methodologies becoming out-dated, existing platforms that are perceived to be inflexible and difficult to extend, insufficient product coverage, lower performance and rising maintenance costs. Participants appear to be experiencing an ever increasing need for complex and flexible analysis and reporting, which their existing systems and infrastructures cannot respond to at an acceptable level of cost for the required performance.

Technology Integration

The biggest concern with the participant's risk management technology environments remains the lack of integration among systems, which is a theme that has been consistent across our surveys since 1999 (Figure 51). Our survey focused on four main integration approaches – manual integration (dual-keying and manual data transfer such as ftp), point-to-point interfaces, middleware, and data warehousing. While many organizations use a combination of some or all of these techniques, the relative popularity of each can provide insights into the progress firms are making against this significant challenge.



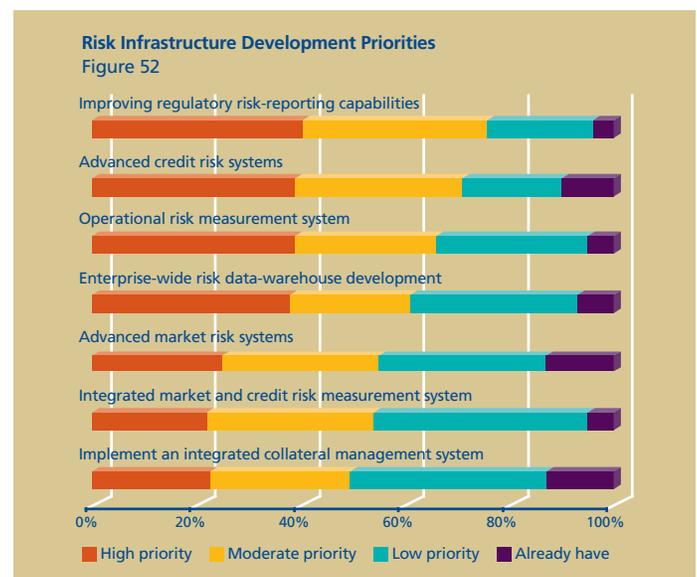
In terms of manual methods, manual data transfer continues to be used by a significant majority (62% chose somewhat or extensively used) while dual-keying is still being used by just under half of respondents (48%). Point-to-point interfaces continue to be a popular system integration method with 70% of respondents indicating that “batch transfers” are somewhat or extensively used, while 45% indicated the use of “real-time” data transfers. Relatively few participants use middleware extensively at the moment (30%), and 58% do not use or have no plans to use message based or middleware solutions. This apparent conflict between a desire for integration and a lack of enthusiasm for one widely promoted potential solution can perhaps be explained by the relative immaturity of the application of such approaches by risk system vendors to date as well as the implementation complexity common with such solutions.

In terms of integration using data warehousing technology, half of respondents indicated that “data warehouse and online analyses” were somewhat or extensively used. On the other hand, the almost total absence of participants using “virtual data warehouse techniques” and the lack of desire to do so is a notable finding. These results are consistent with the system-centric approach at many institutions where data has remained in silos and has resulted in many of the integration issues that participants are

currently experiencing. Based on our experience with clients and the continuing consolidation trend in the financial services industry, we expect integration issues will remain the top information technology issue for the foreseeable future.

Risk Infrastructure

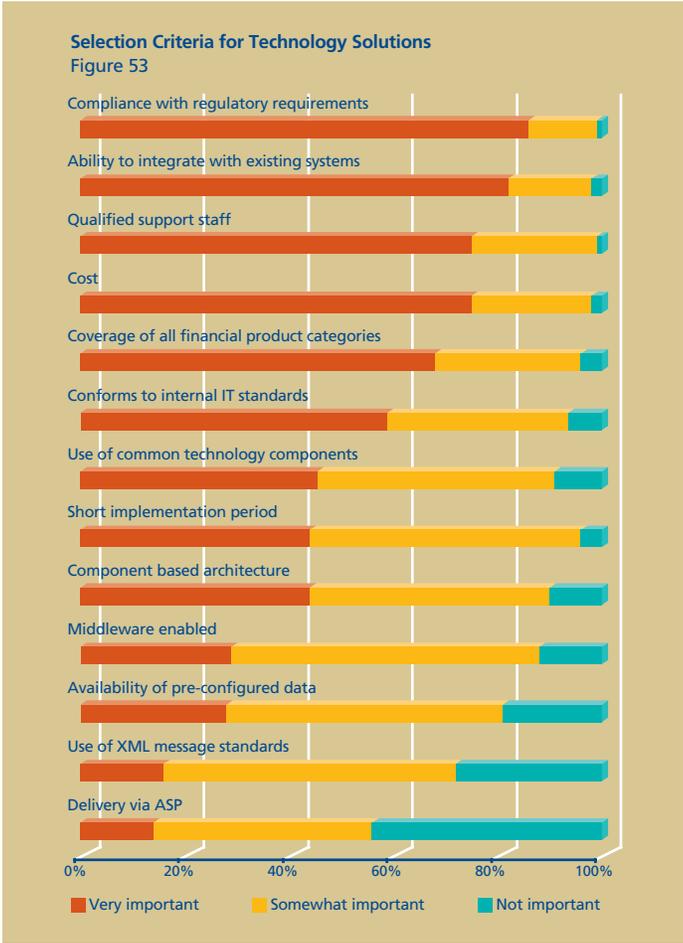
The importance of regulatory reporting has grown markedly since our last survey, and it is no surprise that it ranks the highest in our participant's ratings, marginally ahead of the requirement for operational risk and advanced credit risk systems (Figure 52). The impact of the Sarbanes-Oxley requirements in the United States and equivalent requirements elsewhere, the ongoing efforts to achieve Basel II compliance and the growing demands to address anti-money laundering and related issues have focused business attention on this area – 75% of respondents identified regulatory risk-reporting as a moderate or high priority. When the results for advanced credit risk systems (39% “high priority”) and operational risk measurement (39% “high priority”) are also considered, the impact that advanced regulatory reporting requirements such as Basel II are having and will continue to have on the risk platforms of our respondents becomes readily apparent.



Perhaps even more enlightening than the continued increase in perceived need for advanced analytical and reporting systems, is the fall in the percentage of respondents who are of the opinion that such capabilities are already in place at their institution. Results from the 2002 survey showed 19% of respondents believed that advanced credit risk systems were in place, versus 10% in 2004. The same trend is evident in advanced market risk systems with 25% of survey respondents stating they “already had” this functionality in 2002; for 2004, the percentage of respondents selecting this answer dropped to 13%. While several explanations can account for these trends, it would appear that advanced analytic and reporting requirements have gained increased appreciation as core components in an evolving risk framework, existing platforms and procedures that were considered to be adequate are now being reassessed.

Selection Criteria

The increasing requirements for advanced credit and regulatory reporting, allied with the issues around existing systems noted above, can be clearly seen in the criteria that are most important when selecting a risk management solution or platform (Figure 53).



Given the regulatory developments over the past couple of years, it is not surprising to see the high level of importance given to “compliance with regulatory requirements” as a selection criterion. Other criteria selected by a majority of respondents include “ability to integrate with existing systems” (82%), “qualified support staff” (75%), “cost” (75%), “coverage of all financial product categories” (68%), and “conforms to internal IT standards” (60%). Respondents considered “use of common technology components,” “short implementation period,” use of a “component based architecture” and “middleware enabled” to be of some importance.

Extended Enterprise Solutions

With each of our global risk management surveys, we identify new areas that are garnering meaningful attention across the financial services industry and consider whether they should be included. In this year’s survey, the topic of Extended Enterprise (EE) solutions was selected due to its high visibility and the potential challenges and risks in managing these business arrangements. Our results indicate that a variety of extended enterprise approaches are employed by companies hoping to focus on the core value-adding activities and that risk management of these arrangements is evolving.

Use of Extended Enterprise Solutions

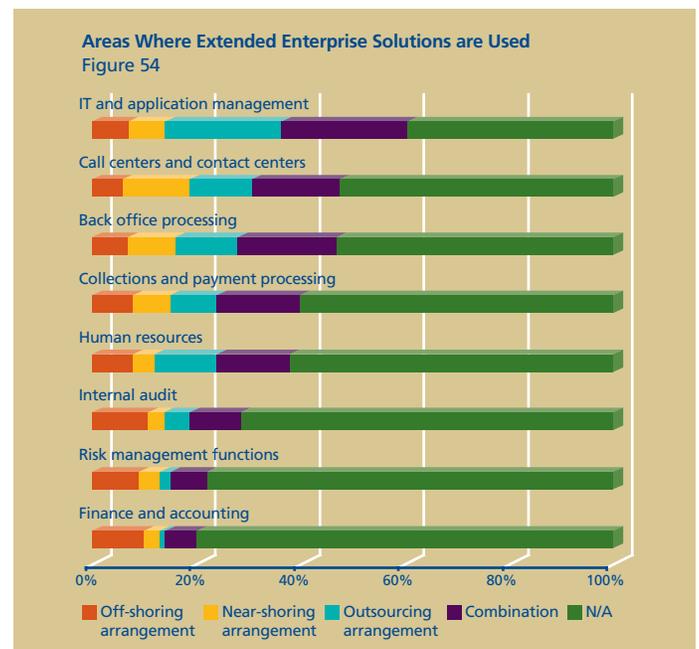
We have seen an overall increase in economic and operational efficiency due to productivity gains enabled by the development of global technology and communications infrastructure. Near instantaneous global data transfer and communication are leading to employment of EE solutions for specialized functions that were traditionally held in-house.

Because our risk survey was global in scope, we adopted standard definitions to describe three separate EE solutions:

- Off-shoring – global sourcing within a company
- Near-shoring – regional sourcing within a company
- Out-sourcing – regional or global transfer to a third party

Our survey results suggest that financial institutions are employing EE solutions to varying degrees in functions across the organization (Figure 54). As might be expected, the areas or functions where EE solutions are most often employed are those where technology factors heavily into the performance of key tasks. In fact, a majority of respondents (61%) employ one or more EE solutions for “IT and application management.” This function also happened to be the one most frequently outsourced with 22% of respondents indicating this approach was used. Call centers and back office

processes were areas where a near majority (47%) employed one or more EE solutions.



Moving to areas where respondents opted to retain in-house capabilities, “finance and accounting,” “risk management functions,” and “internal audit” were functions that a significant majority indicated no EE solution was employed. The survey results for these functions align with the general perception that they require considerable familiarity and professional judgment, are complex, and are tightly aligned with the management objectives of the company. Employment of an EE solution in these situations may not be feasible or desirable given their core importance to most financial institutions. Between the two ends of the spectrum were “human resources” and “collections and payment processing” where around 40% of respondents employed some type of EE solution.

Risk Management of Extended Enterprise Solutions

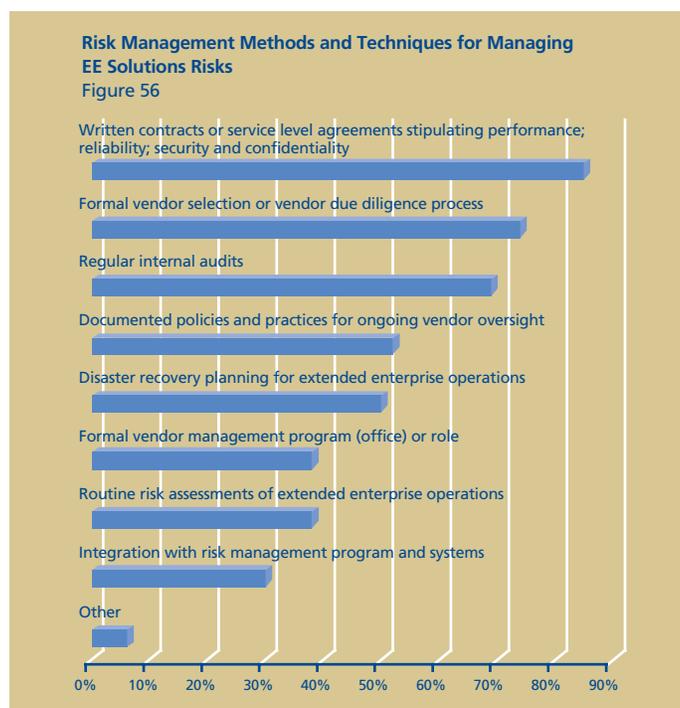
While EE solutions often provide significant benefits to an organization in terms of cost reduction and efficiency, these arrangements create a new set of risks that must be managed (Figure 55). Respondents indicated that operational (83%), and IT (82%) risks were of highest concern (medium plus high risk categories). This is not surprising given the technical and process complexities of employing EE solutions for one or more functions within a company. Of some concern to respondents were confidentiality, regulatory and reputation risks (all ranging between 60% and 70% for the sum of medium plus high risk responses). Interestingly, respondents did not consider geopolitical to be a significant concern with 63% of respondents rating it a low risk.

We also asked respondents to assess the level of integration that existed between EE solutions and an institution’s risk identification, management and monitoring processes. Less than a quarter (24%) of respondents considered their EE solutions’ risk management capabilities to be very integrated, while slightly less than half (45%) considered them somewhat integrated. Nearly one-third (31%) of participants thought their EE solutions and their institutional risk management programs were not integrated at all.



Risk Management of Extended Enterprise Solutions

Our final query of survey participants focused on the methods or techniques employed to manage EE risks (Figure 56). As the nearby chart shows, EE risk management methods and tools can be grouped into three tiers based on rates of adoption. The first tier includes written contracts and service level agreements (85%), formal vendor selection and due diligence (74%) and regular internal audits (69%). The second tier includes documented oversight policies (52%) and business continuity planning (50%). The first two tiers represent methods and techniques employed by a majority of respondents. A final tier of risk management approaches includes using a vendor management office (38%), EE risk assessments (38%) and integration with the institutions risk management capabilities (30%).



2004 Global Risk Management Survey Contacts

Survey Editors

Michael A. Bailey
Principal
Capital Markets
Deloitte & Touche LLP
+1 312 946 3618
mibailey@deloitte.com

Edward T. Hida II
Partner
Capital Markets
Deloitte & Touche LLP
+1 212 436 4854
ehida@deloitte.com

Contributing Authors

Dolores Atallo-Hazelgreen
Firm Director
Capital Markets
Deloitte & Touche LLP
+1 212 436 5346
datalloahazelgreen@deloitte.com

William G. Foote
Firm Director
Capital Markets
Deloitte & Touche LLP
+1 212 436 3511
wfoote@deloitte.com

George Travers
Partner
Capital Markets
Deloitte & Touche LLP
+1 212 436 4365
gtravers@deloitte.com

Craig R. Brown
Firm Director
Capital Markets
Deloitte & Touche LLP
+1 212 436 3356
crabrown@deloitte.com

Alok Sinha
Principal
Capital Markets
Deloitte & Touche LLP
+1 415 783 5203
asinha@deloitte.com

Global Contributors and Coordinators

Frederic Barneche
Neuilly, France
+33 1 40 88 22 65

Andrew Goulden
London, United Kingdom
+44 207 007 1828

Ian Perry
Wellington, New Zealand
+64 4 495 3917

Jaime Barra
Santiago, Chile
+56 2 270 3377

Matthew Johnson
Singapore
+65 6232 7183

David Vicary
Kuala Lumpur, Malaysia
+6 03 7723 6523

Leon Bloom
Toronto, Canada
+1 416 601 6244

Richard Kirkland
Wellington, New Zealand
+64 4 470 3513

Duco Wansink
Amsterdam, Netherlands
+31 20 582 5420

Philippe Deniau
Neuilly, France
+33 1 40 88 22 83

Terrel LaRoche
Houston, US
+1 713 982 2944

Ana Yague
Madrid, Spain
+34 915 145 000

Joerg Engels
Duesseldorf, Germany
+49 211 8772 2376

Ives Muller
Sao Paulo, Brazil
+55 11 5185 2444

Alfonso Gomez
Mexico City, Mexico
+52 55 5080 6176

Hirota Norita
Tokyo, Japan
+81 3 6213 3718

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