



Global risk
management survey,
seventh edition
Navigating in a
changed world

Contents

Foreword	1
Executive summary	2
Introduction	4
Risk governance	8
Enterprise risk management	14
Regulatory and economic capital	19
Management of key risks	28
• Credit risk	29
• Market risk	30
• Liquidity risk and asset liability management	31
• Insurance risk	33
• Operational risk	34
• Regulatory risk	36
Risk management systems and infrastructure	39
Conclusion	43

Foreword

Dear Colleague,

We are pleased to present Deloitte's *Global risk management survey, seventh edition*, our latest assessment of the state of risk management at financial services institutions around the world.

The financial services industry is emerging from an extraordinarily unsettled period. The global financial crisis was marked by market volatility, a lack of liquidity in many financial markets, and heightened systemic risks. The turmoil of the last several years has underscored the critical importance of risk management and led government officials, regulators, and industry leaders alike to set new expectations for risk management.

Regulatory requirements are being rethought and fundamentally revised with the goal of reducing systemic risk to the financial system. Therefore, the boards of directors and senior management of financial institutions are reexamining their approaches to risk management, including their risk frameworks, governance, and methodologies.

At many institutions, boards of directors are taking a more active role in providing oversight of risk management, including establishing the risk management policy and framework and approving their institution's risk appetite. More institutions have a Chief Risk Officer, who is often a member of the senior management team and has direct access to the board of directors or the board's risk committee. Enterprise risk management programs are becoming more commonplace across the industry, and at many institutions, especially in Europe and Canada, the work of implementing Basel II has been largely completed.

But while progress has been made, risk management now faces even more rigorous requirements. There is likely to be wider use of tools that have been demonstrated useful in measuring risks, such as stress tests; the precision of risk models may also be evaluated more closely. Institutions that have not already adopted enterprise-wide risk management programs may be more likely to do so. Senior management at many institutions may consider how they can build a more risk-aware culture, in part by incorporating risk management considerations into performance goals and compensation decisions for key employees throughout the organization.

Financial services institutions may also need to be prepared to comply with fundamental regulatory change. The Basel III framework includes requirements for higher levels of capital and greater liquidity. There are also important changes to regulatory frameworks in individual countries: The 2010 Dodd-Frank Wall Street Reform and Consumer Protection Act constitutes the most important set of changes to financial regulation in the United States since the 1930s; similar regulatory changes are proposed for the European Union; and the United Kingdom has announced plans to abolish the Financial Services Authority and to have the Bank of England assume a greater role in prudential regulatory oversight.

Deloitte's survey provides a picture of the state of risk management as financial services institutions respond to enormous changes across the industry. This assessment is based upon the responses of 131 financial institutions from around the world with more than \$17 trillion in total assets; we wish to express our appreciation to each of the institutions that participated.

We hope that this survey report provides you with useful information about how financial institutions are navigating the challenges of risk management today and encourages a dialogue that can help enhance risk management in a changed world.

Sincerely,

Edward T. Hida II, CFA
Global Leader – Risk & Capital Management
Global Financial Services Industry
Deloitte Touche Tohmatsu Limited

As used in the document, "Deloitte" refers to Deloitte Touche Tohmatsu Limited, a U.K. private company limited by guarantee, and its network of member firms, each of which is a legally separate and independent entity. Please see www.deloitte.com/about for a detailed description of the legal structure of Deloitte Touche Tohmatsu Limited and its member firms.

Executive summary

After the turmoil of the global financial crisis characterized by financial market dislocations and loss of liquidity,¹ many world economies and financial markets appear to be strengthening, but serious concerns remain. Although the financial services sector is recovering, institutions are not returning to the same playing field; instead, they are operating in a changed world marked by fundamental shifts. During the last few years, risk management assumptions and methods have been challenged as never before.

As a result, many institutions are rethinking their risk management governance models, including a more active role for their boards of directors in overseeing risk management. Some risk management methodologies may need to be reassessed and validated to assess whether they adequately measure the “tail” risk from rare, but potentially catastrophic, events. Many institutions are revising their business models in response to the global financial crisis and the regulatory changes that have resulted, and so risk management programs may need to adjust accordingly. A wave of regulatory change will almost certainly mean greater oversight, especially for institutions that are deemed to be systemically important.

Deloitte’s *Global risk management survey, seventh edition*, assesses the state of risk management in this new environment. The survey was conducted during the third quarter of 2010: 131 financial institutions from around the world, with aggregate assets of more than \$17 trillion and representing a range of financial services sectors, participated.



Key findings

- Roughly 90 percent of institutions had a defined risk governance model and approach, and 78 percent reported that their board of directors had approved their risk management policy or enterprise risk management (ERM) framework.
- The position of chief risk officer (CRO) continued to become increasingly prevalent. Eighty-six percent of institutions had a CRO or equivalent position, up from 73 percent in 2008 and 65 percent in 2002. The CRO has been given a high profile, reporting to the board level or to the chief executive officer (CEO), or both, at 85 percent of institutions. Fifty-one percent of institutions reported that the board of directors conducts executive sessions with the CRO, compared to 37 percent in 2008.
- In the wake of the global financial crisis, the importance of incorporating risk management considerations into performance evaluations and compensation decisions has been widely discussed; thirty-seven percent of institutions reported that they had completely or substantially done so for business unit personnel.
- More institutions have adopted ERM programs, as 79 percent of institutions reported having an ERM program or equivalent in place or in progress, an increase from 59 percent in 2008. The greatest challenges in implementing an effective ERM program, cited by roughly a quarter of institutions as extremely or very challenging, were integrating data across the organization and cultural issues.
- Institutions were far along in Basel II implementation, with 70 percent or more having fully or mostly completed implementation in the areas of external agency ratings (for the standardized approach), calculation and reporting, internal audit review, and governance and controls. Roughly one-third of executives expected that the Basel II rule revisions announced in July 2009 would have significant impacts on their strategy in such areas as entering new geographical markets, changing their business model, or conducting mergers and acquisitions.²

¹ “A defining characteristic of the crisis was the depth and duration of the systemic liquidity disruption to key funding markets—that is, the simultaneous and protracted inability of financial institutions to roll over or obtain new short-term funding across both markets and borders.” *Global Financial Stability Report, Sovereigns, Funding and Systemic Liquidity*, International Monetary Fund, October 2010.

² The Basel Committee has continued to strengthen its bank supervisory standards, particularly regarding banking regulatory capital and liquidity requirements as noted in its December 2010 releases, *Basel III: A global regulatory framework for more resilient banks and banking systems*, and *Basel III: International framework for liquidity risk measurement, standards and monitoring*.

- For insurance institutions subject to Solvency II, 70 percent or more said they plan to focus over the next 12 months on program initiation, gap analysis, and planning; risk governance; and Own Risk and Solvency Assessment (ORSA).
- Although the percentage of institutions that calculate economic capital increased since 2008, the practice was far from universal. Roughly two-thirds of institutions calculated economic capital for credit risk, market risk, and operational risk, while 29 percent did so for liquidity risk and 17 percent for strategic risk.
- The use of stress testing is increasingly commonplace across the industry, supplementing the use of Value at Risk (VaR) and other risk analytics. Eighty-eight percent of institutions used stress testing for risk factors affecting their credit portfolio, an increase from 79 percent in 2008, while 74 percent conducted stress testing for market risk in their trading book.
- More than 80 percent of institutions experienced significant impacts from regulatory changes in the countries where they operate; at 40 percent of responding institutions, these impacts included the need to maintain higher capital levels and the need to maintain higher liquidity ratios.
- Progress has been made by many institutions in implementing operational risk management methodologies. Roughly 60 percent of executives considered their operational risk assessments and internal loss event data to be extremely or very well developed, an increase from roughly 40 percent in 2008.
- Many institutions reported that they have additional work to do in improving their risk technology systems. While three-quarters of executives considered their institutions to be extremely or very effective in managing credit, market, and liquidity risk, a lesser 60 percent considered their technology systems to be very effective in supporting the management of credit and market risk, and 47 percent expressed the same concerning the management of liquidity risk. In terms of likely risk management technology improvements during the coming year, data quality and management and enhanced risk reporting were the two areas given the highest priority by survey respondents, at 48 percent and 44 percent, respectively.

The current economic and regulatory environment poses many challenges for financial institutions and in turn for risk management. Having flexible risk management programs may help financial institutions to be effective in adapting to new business models and changing regulatory requirements. Large, systemically important financial institutions may also have additional steps to comply with increased capital, liquidity, reporting, recovery, resolution, and other requirements.

Strong risk governance continues to increase in importance, and boards of directors will likely need to continue to be actively involved in providing input into, challenging, and approving the risk management framework and overseeing the program. The increasing prevalence of a CRO position as a member of the senior management team is a positive trend: The CRO can help clarify accountability for the risk management program and can aid the board by providing a view, independent of management, of key risk management issues and the institution's risk profile.

At many institutions, risk management programs are likely to include a growing spectrum of risk types, such as model risk, and to use more sophisticated techniques, such as stress tests. Risk technology and information systems may need to be upgraded to easily integrate risk data on a consistent basis across different products, geographies, and counterparties. In the final analysis, an institution's risk profile can be defined by the sum total of business decisions taken every day by employees throughout the organization. The linkages between business operations and effective risk management should continue to be assessed and nurtured. In addition to a focus on risk management methodologies and reporting, senior management may need to further develop a risk-aware culture throughout the organization. One important consideration in this effort is the closer alignment of performance management and incentive compensation with risk considerations and accountability. Beginning with strong governance by the board of directors and senior management, and continuing with a focus on risk management by every employee, institutions may be better positioned to navigate effectively the challenges of a changed world for risk management.

Introduction

Deloitte's *Global risk management survey, seventh edition*, was conducted during the third quarter of 2010, as the financial markets and the world economy were climbing back from the impacts of the global financial crisis. The survey assessed the current status of risk management programs in the financial services industry—common practices, enhancements being made, and remaining challenges—based on responses from 131 financial institutions from across geographic regions and industry sectors, and of varying asset sizes. (See "About the survey.")

Growth returns

After contracting by 0.6 percent in 2009, the world economy returned to growth: The IMF estimated the world economy grew by 5.0 percent in 2010 and that it will grow by 4.5 percent in 2011, largely due to expected growth of 6.5 percent in emerging economies this year.³ During 2010, the recovery remained tenuous in the United States and in many other developed economies, and there were concerns about whether growth could be sustained and the possibility of a double-dip recession in some economies.

Although the markets for securitized assets, such as CDOs, remained a fraction of their size as compared to before the crisis, securities issuance broadly has recommenced and corporate M&A activity has returned. Equity markets have posted positive returns, with the MSCI World Index for developed countries gaining 9.55 percent in the 12 months through December 31, 2010.⁴

In response to the global financial crisis, many major economies undertook fiscal stimulus programs in an effort to spur economic growth, although a significant number of these programs are now winding down. On the monetary front, the U.S. Federal Reserve and the Bank of Japan reduced short-term government interest rates to at or near zero percent.

These initiatives have led to concerns about rising levels of public debt. According to the IMF, gross government debt in the world's developed economies, which was 70 percent of GDP in 2007, rose to 97 percent in 2009 and is expected to reach 110 percent by 2015.⁵ In 2010, Greece required a \$145 billion financial rescue package from the European Union and the IMF, while Ireland required a package of \$112 billion. There were also concerns about sovereign debt in other countries such as Portugal, Spain, and Italy. On the other hand, interest rates on U.S. Treasuries and German government bonds remained below three percent. These conflicting signals have fueled a vigorous debate about whether governments should take immediate action to bring down debt levels or whether the short-term priority should be to further stimulate the economy. The decision by the U.S. Federal Reserve in November 2010 to purchase \$600 billion in Treasury securities in a second round of "quantitative easing" generated additional controversy over the potential impact on the value of the dollar and on asset prices in other markets, especially in developing markets.

Stabilizing the financial sector

In many countries, governments provided assistance to their financial institutions, including through the Troubled Asset Relief Program (TARP) in the United States. By the end of 2009, Tier 1 capital among global financial institutions had risen to more than 10 percent, with more than half the capital coming from governments, according to the IMF.⁶ In October 2010, the IMF estimated total write-downs and loan provisions from the global financial crisis by banks at \$2.2 trillion, with three-quarters of this amount already reported and \$550 billion estimated still to be realized.⁷ While these government initiatives helped to stabilize the financial system, they have also led to public criticism of financial assistance being provided to major financial institutions. In the wake of the crisis, there have also been a number of regulatory investigations and legal actions involving individuals and firms.

³ "World Economic Outlook," IMF, January 2011

⁴ Index Performance, January 2011, MSCI, http://www.msicbarra.com/products/indices/international_equity_indices/performance.html

⁵ "Withdrawal Symptoms," *The Economist*, October 9, 2010

⁶ "World Economic Outlook," IMF, October 2010

⁷ "World Economic Outlook," IMF, October 2010

Many financial firms have recovered from the crisis and are now returning to profitability. In the United States, many of the major banking institutions have now repaid the financial assistance they received under the TARP program, although balances remain among other recipients in housing finance, insurance, and the auto industry. In addition, significant unrepaid balances remain among institutions in Europe that received government capital infusions. In 2009, the U.S. Federal Reserve and other bank supervisors conducted a stress test based assessment of the capital held by the 19 largest U.S. bank holding companies, which increased transparency and appeared to bolster confidence among investors. In 2010, the Committee of European Banking Supervisors also conducted stress tests of European banks. In late 2010, a new round of stress tests in both the U.S. and Europe was announced.

A changed world

The responses to the global financial crisis on the part of governments, regulatory authorities, and financial institutions are leading to fundamental changes in the environment for financial services.

Industry restructuring. The global financial crisis spurred further consolidation of the industry as some major institutions closed and others merged with stronger competitors. Increasing regulatory capital requirements for larger financial institutions could potentially lead to additional growth for nonbank financial institutions subject to less stringent regulation.

New business models. In the United States, the 2010 Dodd-Frank Wall Street Reform and Consumer Protection Act (Dodd-Frank Act) prohibited most proprietary trading by banks and required that most derivative products be traded on exchanges and centrally cleared. This may lead some banks to spin off their hedge funds and private equity subsidiaries and to close their proprietary trading desks. It may also create opportunities for small and mid-size firms to compete in the “white space” vacated by the major players. These changes may also pose additional risks—operational, counterparty credit and/or funding—for those that interact with these newly separate entities.

More regulation and government oversight. There has been a wave of regulatory change, with stricter requirements and enhanced scrutiny in many countries; there has been a shift in mind set with regard to regulatory supervision—more aggressive and with higher demands for data and information to support representations made by financial institutions to their regulators. The United States has been an early mover on financial regulatory reform and in a quite sweeping way, relative to many other jurisdictions: The Dodd-Frank Act was the greatest change to financial regulation in the United States since the 1930s. In the United Kingdom, the government announced in 2010 a major reorganization of regulatory oversight, with the Financial Services Authority (FSA) being abolished and its prudential regulatory responsibilities being assumed by a subsidiary of the Bank of England. In both the United States and the United Kingdom, new regulatory agencies are being created to monitor compliance with consumer protection regulations.⁸ Additional regulatory changes are also anticipated by the European Union.

The Basel III requirements, originally proposed in December 2009 and issued in December 2010, may have the greatest impact. The new requirements include higher levels of capital, with a focus on requiring a higher “quality” of capital such as common equity, as well as new leverage and liquidity ratios for institutions. Basel III builds on the Basel II framework, with the intent of strengthening the regulation, supervision, and risk management of banks.

There has been an active debate on the possible impact that the changes in Basel III would have on economic growth. In June 2010, the Institute of International Finance issued an analysis that concluded the proposed changes could reduce the absolute level of GDP in developed countries by approximately three percent by 2015.⁹ In August 2010, the Basel Committee on Banking Supervision issued its own analysis, concluding that absolute GDP would be 0.6 percent lower during an assumed four year implementation than it otherwise would have been, but then would be higher over the long term due to fewer financial crises.¹⁰ The eventual, full impact of Basel III and other regulatory changes remains to be seen and will depend to a great extent on the specific regulations that are put in place to implement them.

⁸ “UK Banking after the Crisis,” presentation by Charles Randell, Slaughter and May, October 2010

⁹ “Super Model,” *The Economist*, August 19, 2010

¹⁰ Ibid.

Consumer protection initiatives. Reforms with direct consumer and/or consumer protection implications have been numerous and touch areas including BSA/AML, fair lending, foreign account tax compliance, credit cards, and mortgage-related activities. Both the United States and the United Kingdom have created new consumer protection agencies that are charged with regulating firms providing financial products to consumers. The goal of these reforms is to increase consumer protection, but they may also increase costs charged to the consumer and slow the introduction of new products.

New paradigm for monitoring systemic risk. Regulatory authorities have increased their focus on identifying and managing systemic risks to the financial system. The Dodd-Frank Act imposes additional reporting requirements on institutions designated as “systemically important,” and also requires these institutions to create recovery and resolution plans. The Dodd-Frank Act also creates a Financial Stability Oversight Council charged with identifying and responding

to emerging systemic risks, as well as an Office of Financial Research to improve the collection and analysis of financial market data for financial regulators. In Europe, a European System Risk Board was created to monitor and assess systemic risk in the European financial system. Finally, Basel III includes the requirement that systemically important financial institutions be required to hold additional capital.

The economic and regulatory landscape remains unsettled, with concerns remaining about the outlook for the world economy and with the details of new regulations still to be finalized. Financial institutions are rethinking their business models and assessing the likely impacts of the new regulatory requirements. As a result, significant enhancements in industry risk management practices may be expected to continue to occupy the agendas of financial services institutions for some time in such key areas as systemic risk, enhanced capital and liquidity approaches, strengthened risk oversight and governance, and remediated risk data.

The financial services marketplace has become so complex that continuous improvement and enhancements in the risk management function will continue to be important for years to come. An effective, comprehensive risk management program must evolve constantly to meet changes in the environment: As the business changes, so must the tools and processes used to assess and manage risk.

— Director of risk management, asset management firm

Figure 1
Participants by headquarters location

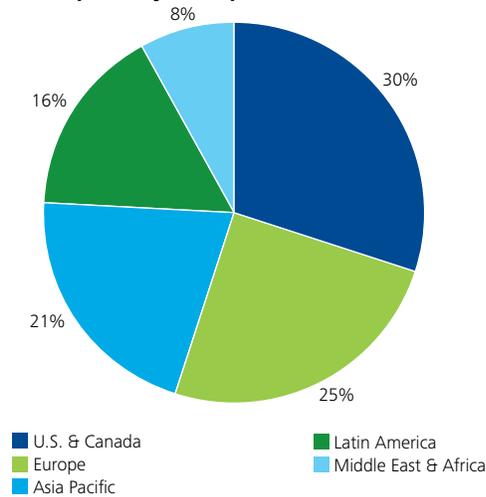


Figure 2
Participants by primary business

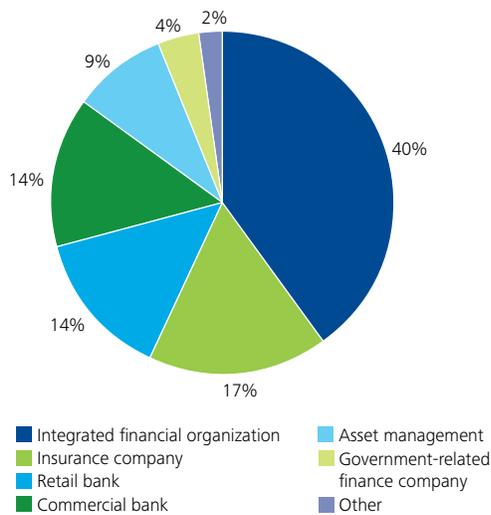
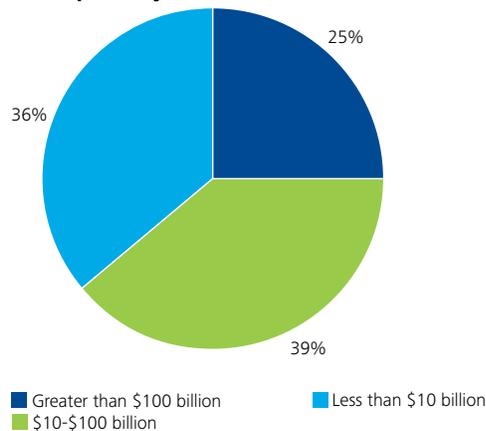


Figure 3
Participants by asset size



About the survey

This report presents the key findings from the seventh edition of Deloitte’s ongoing assessment of risk management practices in the global financial services industry. The survey gathered the views of CROs or their equivalents and was completed by 131 financial services institutions around the world. It was conducted in the third quarter of 2010.

- Institutions participating in the survey represented the major geographic regions of the world. Most of the survey participants were multinational institutions, with 59 percent having operations outside their home country (see Figure 1).
- Survey participants also represented a variety of financial sectors, with most being integrated financial organizations, insurance companies, retail banks, and commercial banks (see Figure 2).
- The institutions providing asset management had total assets under management of \$14.1 trillion.

The sixth edition of our risk management survey report series was released in early 2009, based on a survey conducted in the latter half of 2008. Where relevant, this report compares current results with those from the 2008 survey.

Risk governance

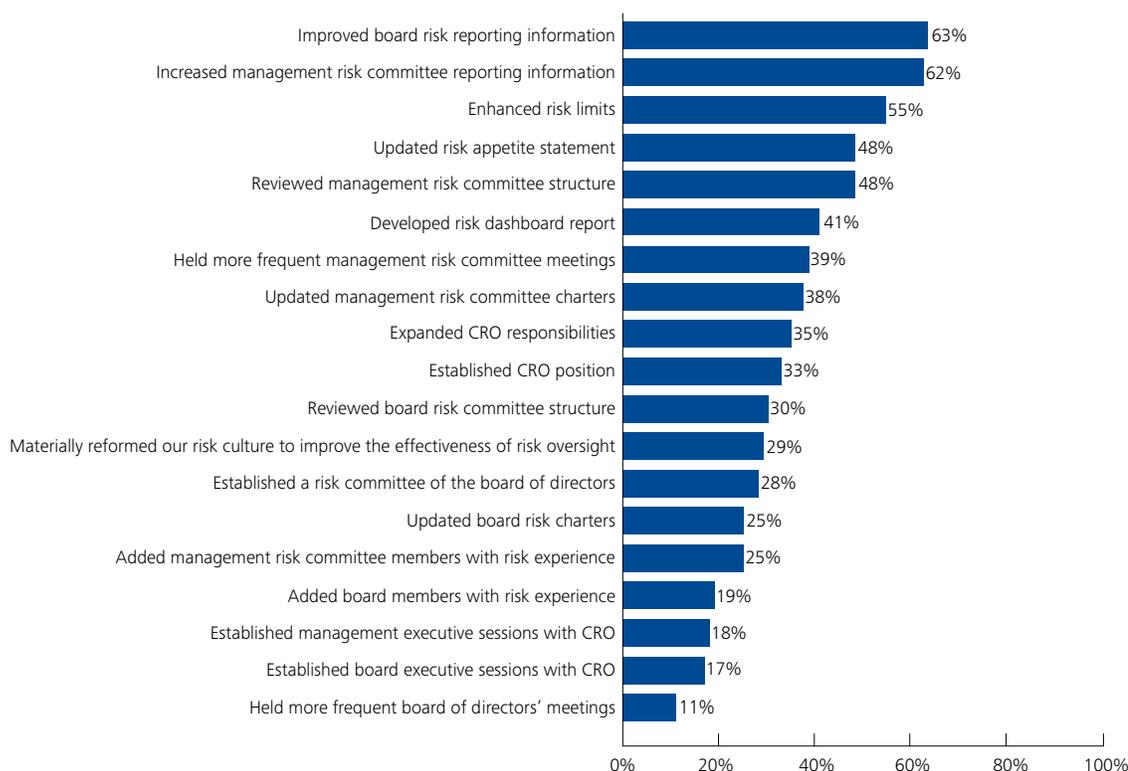
Since the global financial crisis, regulators and others have placed increasing emphasis on the importance of a clear risk governance model, i.e., the approach for directing the management and control of risk, which may be overseen by the board of directors as a whole or through a board risk committee. Regulators are now focusing more closely on the role of the board of directors in setting a financial institution's risk policy and risk appetite and in monitoring that these are implemented effectively by management. In October 2010, the Basel Committee on Banking Supervision issued principles for enhancing corporate governance that addressed such issues as the role of the board of directors, the qualifications of board members, and the importance of an independent risk management function. In the United States, the Dodd-Frank Act requires a risk committee of the board of directors for publicly-traded bank holding companies with total assets of \$10 billion or more as well as for systemically important publicly-traded nonbank financial companies. Also in the United States, U.S. SEC Rule 33-9089, which became effective on February 28, 2010, requires that proxy statements disclose the extent of the board's role in risk oversight. Numerous other industry

and regulatory groups have also issued guidance on risk management oversight, including the Bank for International Settlements, Office of the Comptroller of the Currency, Federal Deposit Insurance Corporation, Committee of Sponsoring Organizations, the National Association of Corporate Directors, and the Senior Supervisors Group.

Strengthening risk governance

The survey found that many financial institutions have taken a variety of actions in response to the increased focus on risk governance (see Figure 4). The most common action, taken by roughly two-thirds of institutions, was to improve the process for reporting of risk information to their boards of directors and to their management risk committees. Roughly half the institutions had enhanced their risk limits and updated their risk appetite statement. These appear to be positive developments because upgrading risk management reporting and reviewing an institution's risk appetite may be appropriate in periods of difficult market conditions marked by volatility, lack of liquidity, changed regulatory expectations, and a weak economic outlook.

Figure 4
Which of the following steps has your organization taken in response to recent concerns regarding risk governance?



Note: Percentages total to more than 100% because respondents could make multiple selections.

Institutions are also devoting more resources to risk management. Committing an adequate number of professionals with the appropriate skills and at the appropriate levels provides the foundation for effective risk management and has been an area of focus for regulators over the last several years. Looking ahead, almost 80 percent of executives expected their institution's spending on risk management to increase over the next three years, with 29 percent expecting increases of 25 percent or more.

Risk governance models

Many banks have strengthened or adopted risk governance models under the impetus of expectations of their regulators. Most insurance companies around the world have been subject to regulatory oversight that encourages them to adopt company-wide risk governance models, although there has been less pressure by state regulators for U.S. insurance companies to do so.

The survey found that 91 percent of institutions had a risk governance model and approach, either one that was fully implemented or in the process of being implemented (see Figure 5). However, a smaller proportion, 78 percent of institutions, reported that their boards of directors had reviewed and approved their risk management policy and/or ERM framework, and this percentage had not increased since the 2008 survey (see Figure 6). The risk governance model is a key risk program element that is typically defined

in the risk management policy and ERM framework and should establish risk governance and oversight, define the institution's risk management roles and responsibilities, define the role of business units in risk management, and specify the process for ongoing monitoring of risk management.¹¹ Roughly two-thirds of institutions said their boards of directors had approved the organization's risk appetite statement or the risk policy framework adopted by management.

Figure 5
Does your organization have a defined risk governance model and approach, which delineates functional responsibilities for risk management?

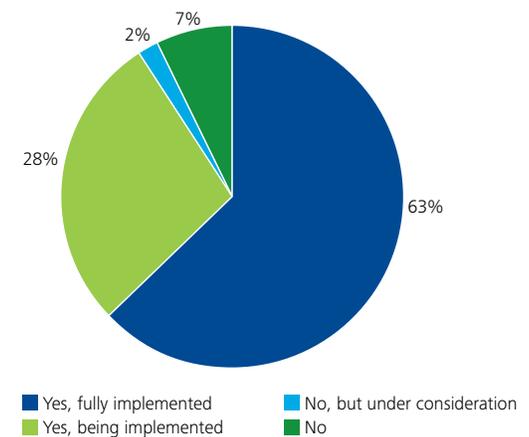


Figure 6
Which of the following describe the roles in risk management of the board of directors in your organization?



Note: Percentages total to more than 100% because respondents could make multiple selections.

¹¹ *Getting Bank Governance Right*, Deloitte Center for Banking Solutions, August 2009, Deloitte Development LLC.

Role of the board of directors

Survey findings showed that at 85 percent of institutions, the board of directors receives and reviews regular reports on the risk management program. The percentage of boards that regularly review risk management reports increased from 73 percent in 2008, which indicates that more boards of directors are actively involved in overseeing risk management. Another indication of increased board involvement is that 51 percent of institutions reported that their boards had executive sessions with the CRO, up from 37 percent in the prior survey. This practice is even more common at large institutions, as 68 percent of the institutions with assets of \$100 billion or more reported that their boards followed this practice.

The importance of aligning compensation and incentive plans with appropriate risk taking has received increasing attention in the period since the global financial crisis. In September 2009, the Financial Stability Board issued a report on the standards for sound compensation practices that identified the importance of having independent and effective board oversight of compensation policies and practices.¹² Among survey respondents, 35 percent of boards of directors reviewed their institution's compensation plans to consider the impact of risk factors. This practice was more common among institutions with assets of \$100 billion or more, where 48 percent of boards reviewed compensation plans from this perspective.

When it came to how the board carries out its risk management responsibilities, 29 percent said that risk management oversight was handled by the full board. A more common scenario, used by 56 percent of institutions, was for the board's responsibilities to be handled by board committees. Additionally, seven percent of the institutions surveyed reported having risk management oversight handled by multiple committees. This latter approach may diffuse responsibility, so when used, it is important to define clearly the role and scope of authority of each individual body. There has been a trend for boards to place this responsibility with a dedicated board risk management committee, an approach used by 37 percent of institutions, although 12 percent used the audit committee. The Dodd-Frank Act requires bank holding companies with \$10 billion or more in total assets to have a dedicated risk committee. In addition, 11 percent of all survey respondents said that an individual board member exercised the board's risk management oversight responsibility. This governance approach was more common in Europe, where 27 percent of institutions followed it, compared with three percent in the United States/Canada and four percent in Asia/Pacific. However, even in Europe, none of the institutions with \$100 billion or more in assets placed the responsibility for risk management oversight with an individual board member.

Across the survey sample, then, risk management oversight is most often a board-level responsibility; current regulatory guidance reinforces this practice.¹³ However, at five percent of the responding institutions, responsibility for overseeing risk management had been delegated to management.

Risk management today is a governance function: The board and the audit committee are more focused than they ever were on enterprise risk. It is more and more common for the risk function to report directly to the board. The expectations around the level and thoroughness of key risk management documentation have greatly increased.

— Chief risk officer, diversified financial services company

¹² *FSB Principles for Sound Compensation Practices*, Financial Stability Board, September 25, 2009

¹³ The board has overall responsibility for the bank, including approving and overseeing the implementation of the bank's strategic objectives, risk strategy, corporate governance, and corporate values. Accordingly, the board should approve and monitor the overall business strategy of the bank, taking into account the bank's long-term financial interests, its exposure to risk, and its ability to manage risk effectively; and approve and oversee the implementation of the bank's overall risk strategy, including its risk tolerance/appetite; policies for risk, risk management and compliance; internal controls system; corporate governance framework, principles, and corporate values, including a code of conduct or comparable document; and compensation system. See *Principles for enhancing corporate governance - final document*, Basel Committee on Banking Supervision, October 2010, <http://www.bis.org/publ/bcbs176.htm>

Regional perspective

There were some significant differences among regions in the responses of institutions to governance enhancements. Institutions in the United States/Canada were more likely to have made changes to their management risk committee: Among institutions in the United States/Canada, 64 percent reviewed the structure of the management risk committee, compared with 45 percent among European institutions and less than 40 percent in Asia/Pacific and Latin America. In the United States/Canada, 83 percent of institutions increased the reporting of information to the management risk committee, while 61 percent in Europe, and half or fewer in other regions, did so. In contrast, 73 percent of European institutions updated their risk appetite statement, compared with 39 percent in the United States/Canada, 40 percent in Asia/Pacific, and 33 percent in Latin America. It is possible that more European institutions may have updated their risk appetite statements in conjunction with Basel II Pillar II Internal Capital Adequacy Assessment Process (ICAAP) and Solvency II ORSA efforts, where Europe is generally ahead of other regions.

Management oversight

Use of management risk committees

About two-thirds of institutions reported having an enterprise risk management committee or equivalent or an asset liability management committee. As might have been expected, large institutions were more likely to have these risk committees, with 84 percent of institutions with \$100 billion or more in assets having an enterprise risk management committee and 81 percent having an asset liability management committee.

The use of management risk committees was found to be less prevalent for some important risk types—58 percent of institutions had a management risk committee for credit risk, 53 percent for operational risk, and 40 percent for market risk. The possible need for specialized risk committees depends on the nature of an institution's business, e.g., those involved in trading would be more likely to need a market risk committee. Among the commercial banks and retail banks, where credit risks are often the largest risk factor, a credit risk committee is common, but not universal; roughly three-quarters of survey respondents reported having one.

Centralization of risk management

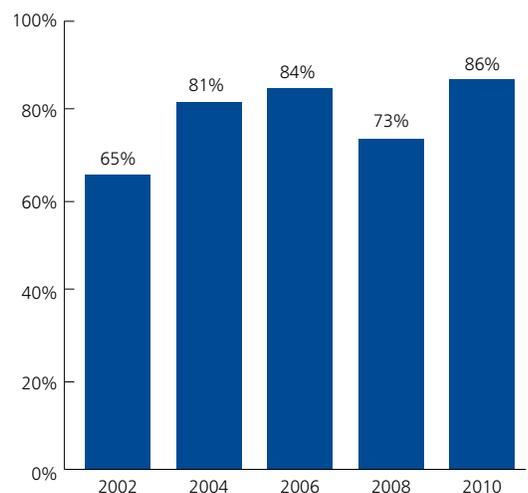
Most institutions had a risk management structure that was either centralized or a mix of centralized and decentralized, with few following a highly decentralized approach. Roughly 70 percent of institutions reported using a centralized approach to setting risk policy and standards, and to defining their risk appetite and setting limits, while two-thirds did so for reviewing their compensation plan to consider the impact of risk factors. The areas where institutions were most likely to follow a mixed approach were in identifying and assessing key risks (47 percent), selecting and implementing risk mitigation strategies (44 percent), and monitoring and identifying emerging risks (47 percent).

Since 2008, a number of institutions moved from a decentralized to a more centralized approach; the latter may help support more consistent policy and supporting methodologies across organizations. Seventeen percent of institutions took a decentralized approach to monitoring compliance with risk limits, down from 28 percent in 2008, while 24 percent took a decentralized approach to assessing the effectiveness of risk mitigation and controls, compared with 33 percent in 2008.

Increasing role of the CRO

The presence of a CRO who reports to the CEO and is a member of the senior management team may help risk management receive appropriate high-level attention. Although the percentage of institutions with a CRO position has fluctuated, the CRO position has generally become more prevalent over time. Eighty-six percent of institutions reported having a CRO or an equivalent position, up from 73 percent in 2008 and 65 percent in 2002 (see Figure 7).

Figure 7
Percentage of institutions with CRO or equivalent, 2002–2010



The CRO or an equivalent senior risk officer position has become widely commonplace at larger institutions; ninety-seven percent of the institutions with \$100 billion or more in assets and 91 percent of the integrated financial institutions reported having this position. Even among institutions with less than \$10 billion in assets, 82 percent had a CRO or equivalent position. Ten percent of institutions without a CRO position had no plans to create one, which is half the figure of 20 percent found in our prior survey.

CRO reporting

Not only is the CRO position more prevalent, generally he or she is also reporting to higher levels within the organization and playing a more strategic role. Sixty-three percent of institutions said that the CRO was supervised by the board of directors or a board-level committee, an increase from 52 percent in 2008. In aggregate, 85 percent of the institutions had the CRO reporting to the board of directors, a board committee, or the CEO, compared to 78 percent in 2008.

The CRO and the enterprise risk management group have more responsibilities and a higher profile. More than 90 percent of institutions said these responsibilities include developing and implementing the risk management framework, developing risk reporting mechanisms, chairing or participating in management risk committees, and escalating risk issues to the CEO or the board of directors. A number of areas of CRO responsibility have also become more widespread since 2008. For example, at 81 percent of institutions, the CRO/risk management group was responsible for assisting in developing and documenting the institution's risk appetite statement, compared to 72 percent in 2008. Similarly, at 64 percent of institutions, the calculating and reporting of economic and regulatory capital was a responsibility, up from 52 percent in 2008.

Infusing risk management throughout the organization

New business initiatives

One of the decisions that can have important implications for risk management is deciding to introduce a new product or enter a new business, and both financial institutions and regulators are increasing their focus in this area. In their business and product approval process, almost all institutions reported considering more traditional major risk types—operational (94 percent), regulatory (91 percent),

credit (89 percent), legal (87 percent), reputational (86 percent), and market (86 percent). Two-thirds of institutions considered the risks from the increased demands on staffing levels and infrastructure, and 56 percent considered the risks resulting from increased transaction volumes. Although considered with less frequency among the survey population, these risk dimensions may also be important for an institution in determining whether it will have the resources necessary to handle increased work flows should a new product be successful.

At more than 90 percent of institutions, included within the scope of the formal business and product approval process were both new business and new product introductions, up significantly from 2008 when 82 percent included new product approvals and 64 percent included new business approvals. Most institutions also considered other initiatives, such as changes to business/product risk profile (77 percent), new systems (72 percent), and the introduction of a business or products to new geographical markets or to a new client base (60 percent). Almost 90 percent of institutions have taken steps to enhance their business and product approval processes, with the most common actions being to increase the involvement of risk management (57 percent), enhance approval policies (54 percent), and require a more thorough review of proposed new businesses or new products (53 percent).

Aligning risks and incentives

The incorporation of risk management responsibility into performance goals and compensation decisions has become another leading practice, and some view compensation planning as a key tool in enterprise-wide risk management effectiveness. The objective is that employees, especially those with the authority to take decisions that entail significant risk, have incentives to consider the risk associated with those decisions.

The current survey's results identified that 37 percent of institutions have completely or substantially incorporated risk management considerations into performance goals across their organizations. For senior management, 56 percent of institutions have incorporated risk management responsibilities into their performance process, increasing somewhat from 49 percent in 2008. For business unit personnel, 37 percent of institutions have incorporated risk management responsibilities into performance evaluations.

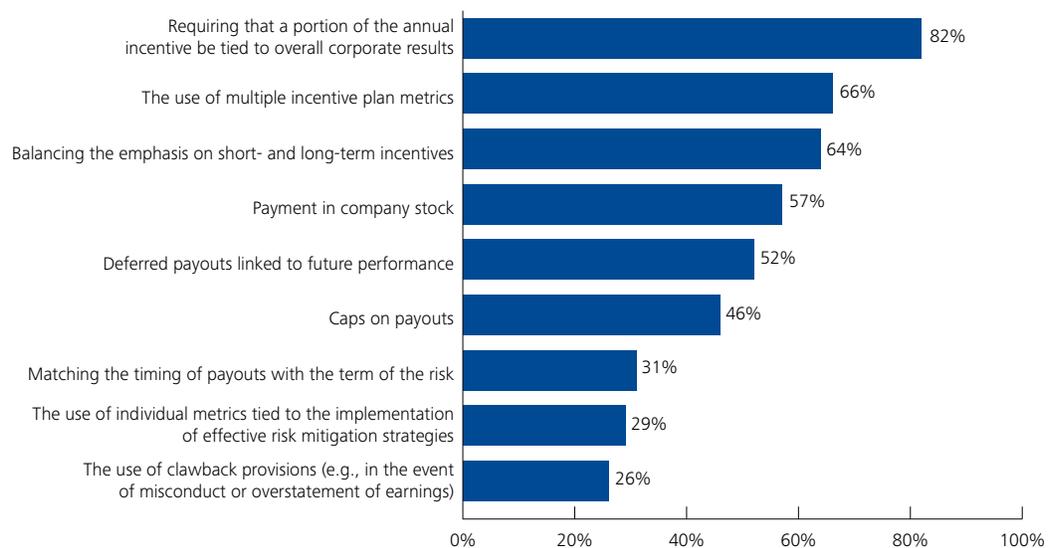
The survey revealed that many institutions are still in the process of adopting changes recommended by regulators and others to better integrate risk management into incentive compensation. For senior management, 82 percent of institutions reported that they required that a portion of the annual incentive be tied to overall corporate results (see Figure 8). For senior management, 64 percent of institutions sought to balance their emphasis

on short-term versus long-term incentives, 57 percent paid their incentive in company stock, and 52 percent deferred payouts linked to future performance. Further, a comparatively lower 31 percent of institutions matched the timing of payouts to senior executives to the term of the risks involved, and 26 percent had instituted clawback provisions in the event of misconduct or the overstatement of earnings.

Compensation is an area where we now have a more rigorous process—including more board-level governance, review, and approvals; more risk management inputs into compensation design. There is a change in the mix of pay, including increased deferrals for higher earners and higher risk takers...and I think industry standards are likely to get stricter in this regard.

— Chief risk officer, global bank

Figure 8
Do you incorporate the following risk management considerations into your incentive plans for senior management?



Note: Percentages total to more than 100% because respondents could make multiple selections.

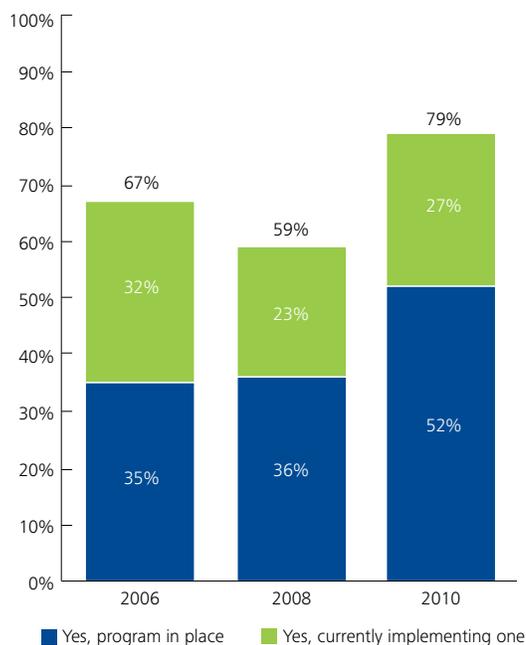
Enterprise risk management

An ERM program is meant to set the overall framework and methodology for how a company manages risks. ERM provides an institution with the tools to clarify its risk appetite and risk profile, and to evaluate risks across the organization. By adopting a comprehensive approach to risk identification and assessment, ERM can help identify many dependencies or interrelationships among risks that might otherwise go unnoticed.

Understanding of the root causes of risk factors and their correlation can be accelerated by an effective ERM program. Looking at risk from an integrated perspective can bring new insights and provide transparency into the overall impact of risk on the institution. Not only does ERM provide an institution with greater insight into its individual risk profiles, it may also allow an organization to assess more completely overall risk levels.

The survey found that adoption of ERM has increased sharply. Fifty-two percent of institutions reported having an ERM program (or equivalent), up from 36 percent in 2008 (see Figure 9). Large institutions are more likely to face more complex and interconnected risks, and among institutions with total assets of \$100 billion or more, 91 percent reported either having an ERM program in place or in the process of implementing one.

Figure 9
Does your organization have an ERM program, or equivalent?



To enhance the effectiveness of ERM programs, institutions may choose to define and approve an ERM framework or ERM policy. Seventy-seven percent of institutions had such a framework, with 70 percent of these institutions saying it had been approved by the board of directors.

We're formalizing our risk program at the enterprise level, and we're getting more disciplined about measuring not only individual risks, but what the potential overall impacts of those risks are.

— Chief risk officer, diversified financial services company

ERM program coverage

Among survey respondents, ERM programs almost always covered the major risk categories of operational risk (98 percent), credit risk (96 percent), and market risk (93 percent).¹⁴ Liquidity risk was covered by 92 percent of ERM programs, up from 82 percent in 2008; this increase seems understandable given the liquidity concerns during the global financial crisis. The coverage of a wide range of risks by an ERM program allows the risk function to contribute more effectively to strategic decisions, because it has a more comprehensive view of risk across the organization.

Other risk categories were included in fewer ERM programs. The importance of managing the risk that models may not accurately assess the probability or severity of potential risk events was highlighted in the global financial crisis. Forty-eight percent of institutions reported that their ERM programs addressed model risk, which was down from 58 percent in 2008. However, 72 percent of larger institutions in the survey said that their ERM programs did cover model risk.

There was an increase in litigation following the global financial crisis, and the ERM programs at 71 percent of institutions included legal risk, compared to 54 percent in 2008. The global financial crisis also tested the business models of some institutions, and the coverage of strategic risk increased to 73 percent from 64 percent in 2008. Fifty-three percent of institutions reported that their ERM programs covered liability management. Relatively few institutions that provided insurance services reported that their ERM program addressed specific categories of insurance risk, such as mortality (28 percent), morbidity (28 percent), lapse (24 percent), and property and casualty (18 percent).

¹⁴ This and the remaining questions related to ERM were only asked of those institutions that reported having an ERM program or an equivalent.

Risk appetite

To support the effectiveness of an ERM program, an institution should consider having an approved enterprise-level statement of risk appetite. Forty-eight percent of institutions reported having an approved, written, enterprise-level statement of risk appetite, while another 24 percent were in the process of defining their risk appetite statement or having it approved. Financial institutions can benefit from having an explicit statement of risk appetite, reviewed and approved by the board of directors as an important part of their oversight responsibilities. The risk appetite statement can then be translated into specific limits and tolerances for businesses and for specific risk categories.

In translating the risk appetite into specific risk limits, roughly three-quarters of institutions set limits for market, credit, and liquidity risk at the enterprise level. About half the institutions established limits at the level of business units for market risk (49 percent), credit risk (56 percent), and liquidity risk (40 percent), and even fewer had limits at the trading desk level for market risk (45 percent), credit risk (30 percent), and liquidity risk (11 percent). Establishment of risk limits for different categories of risk can be an important step towards monitoring that an institution's activities are consistent with its risk appetite. Institutions may set limits for important risk categories at the enterprise level, and many institutions may also benefit from having limits at the business unit level.

Value of ERM

ERM programs allow institutions to achieve a holistic view of risk across risk categories and lines of business. Fully 85 percent of executives felt the value of their ERM program was greater than its cost; yet, many executives found the value of ERM difficult to quantify. While 48 percent of executives said that the overall value of their ERM program was much greater than its cost, 23 percent said the same about its quantifiable financial value. Although the full value may not be quantified, most executives felt ERM provided significant value in specific areas—an improved understanding of risks and controls (81 percent), an increased ability to escalate critical issues to senior management (76 percent), an enhanced risk culture and a better balance of risks and rewards (73 percent), and improved perceptions by the regulators (72 percent).¹⁵ For each of these items, executives were more likely to believe that their ERM programs provided significant value. Three-quarters or more of the executives felt that their ERM programs provided significant value as compared with no more than half in 2008.

¹⁵ Rated 1 or 2 on a five-point scale.

Risk management data challenges

While the value of ERM has increased, so have the challenges of implementing an effective program. The top-rated issue was integrating risk data across the organization, which was rated as an extremely or very significant challenge by 74 percent of executives. Sixty percent of executives gave this rating to data integrity, an increase from 45 percent in 2008. Institutions need the ability to integrate accurate risk data in a timely fashion to support risk reporting and business decision making. Establishing common data standards and definitions are an important element in successful data integration. (See "Risk management systems and infrastructure" later in this report.)

Institutions also recognized that they may need methodologies and metrics that have the flexibility to respond to the evolving requirements of boards of directors, senior management, and regulators. Developing risk technology systems and having appropriate risk methodologies and metrics were each considered to be extremely or very significant challenges by roughly 60 percent of executives, compared to one-third for each issue in 2008.

These findings are understandable. Periods of economic or market instability, such as the global financial crisis can severely test the information capabilities of financial institutions. Such times help highlight the importance of the ability to aggregate risk data across the organization from different lines of business to achieve a consolidated view of an organization's risk profile—for example, when assessing counterparty risk or exposures to particular markets which impact different business areas.

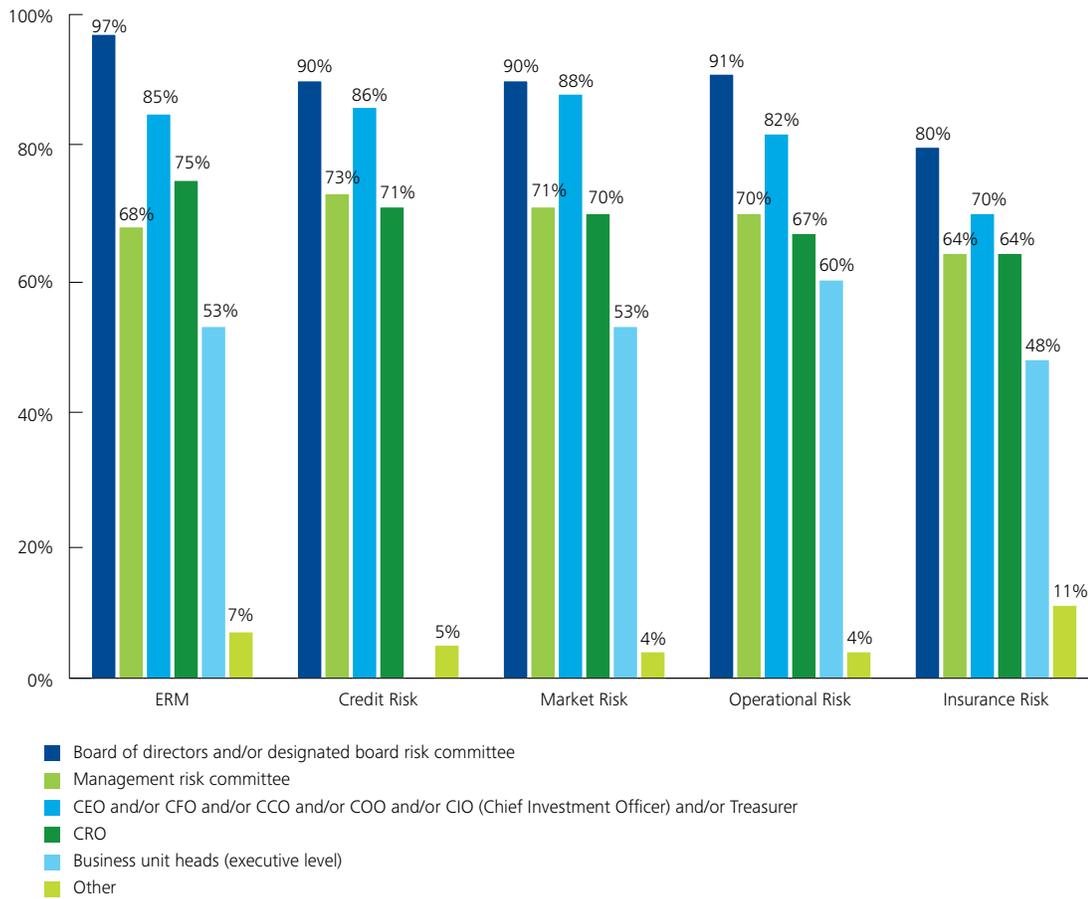


Risk reporting

The board of directors and/or a designated board risk committee received ERM reporting at 97 percent of institutions in the survey, while 85 percent of institutions provided these reports to one or more of the CEO, CFO, CCO, COO, CIO, or treasurer (see Figure 10). Risk

reports were provided to the board of directors and/or a designated board risk committee for market risk and for credit risk at 90 percent of institutions, and for operational risk at 91 percent. Many institutions may be seeking access to a wider range of reliable risk data for their ERM programs because this is not always readily available today.

Figure 10
Which of the following individuals or groups receive risk reporting at the enterprise level for each risk type?

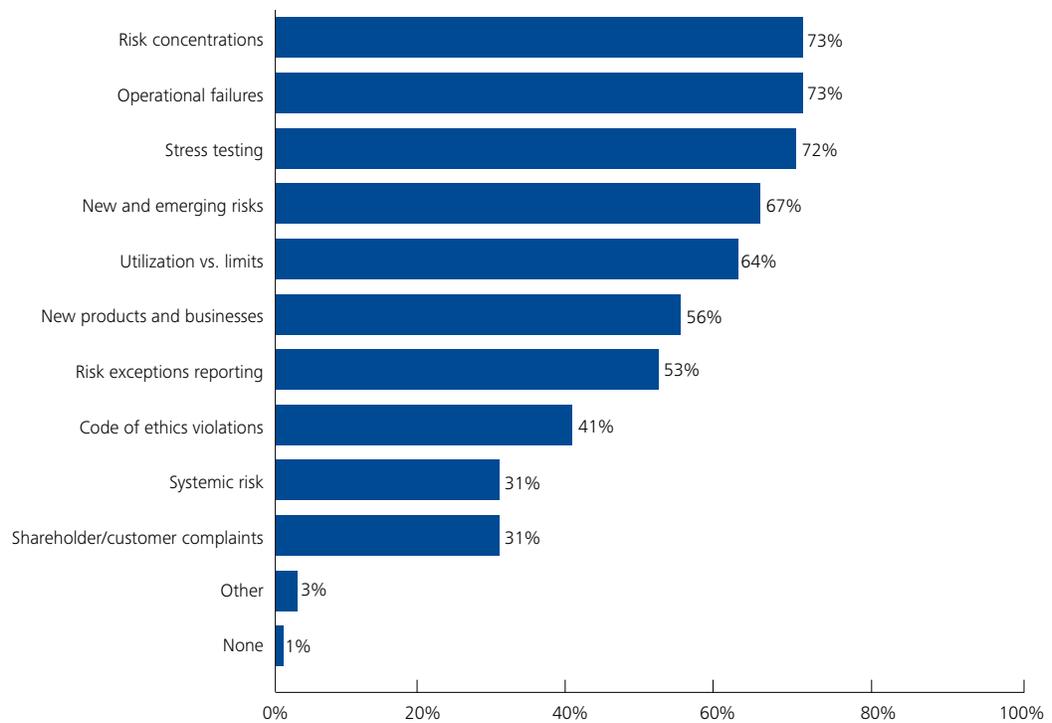


Note: Percentages total to more than 100% because respondents could make multiple selections.

The scope of risk management information commonly reported to the board of directors is indicative of the range and depth of risk management oversight. While this is a new area of focus in our survey, based on changes in market practices, our expectation was that risk reporting to the board of directors would be increased. The survey found that roughly three-quarters of institutions reported risk information to the board of directors on risk concentrations, operational failures,

and stress testing, while two-thirds reported on new and emerging risks and on utilization versus limits (see Figure 11). Given the growing risk management oversight responsibilities of boards illustrated by this survey's findings and the importance of these issues, one may expect more institutions to report this information to their boards of directors more frequently in the future, based on the business mix and relevant risks for the institution.

Figure 11
Which of the following types of risk information does your organization currently report to the board of directors?



Note: Percentages total to more than 100% because respondents could make multiple selections.

Systemic risk

Since the global financial crisis, there has been increased attention on managing systemic risk, or the potential that risk events affecting one institution could threaten the financial system as a whole. More than 90 percent of institutions have taken actions in response to the focus on systemic risk. Roughly 60 percent of institutions have evaluated counterparty concentrations, increased their use of scenario analysis, and enhanced their liquidity funding plan or liquidity cushion. The survey's findings show that only five percent of institutions have a "living will," a plan for the orderly dissolution of the institution in the case of failure, which is required by the U.S. Dodd-Frank Act for systemically important financial institutions and by the Financial Services Act 2010 in the United Kingdom.¹⁶ This is an expected area of focus for large financial services institutions in the coming years.

Stress testing

Stress testing is one tool that financial institutions can employ to help prepare for potential systemic risks by assessing the potential impact of extreme, but rare, events. The portion of institutions that conducted stress testing monthly or less often is 47 percent for the trading book and roughly three-quarters each for the banking book, the structured products book, and counterparty exposures. Given the speed and volatility of financial markets, financial institutions may benefit from conducting stress tests more often than quarterly or annually, to help enable the more timely identification of risks.

The most common usage of stress testing was at the overall enterprise level, employed by 85 percent of institutions. At the enterprise level, it is typically easier to employ top-down stress testing, which employs broad assumptions to examine balance sheet assets and to stratify loan books into different categories based on loss experience for consumers with different credit levels. However, a bottom-up approach may provide more detailed results and offer insight. Many institutions also reported conducting stress testing at lower levels, e.g., 81 percent for individual portfolios and 70 percent for individual business units.

Thirty-four percent of institutions conducted reverse stress testing. This is a new method that does not use predefined scenarios, but instead tries to identify scenarios that would cause the institution to fail (so called "killer scenarios"). It is an emerging practice that can help identify vulnerabilities that might otherwise go unnoticed, and regulators are increasingly looking at the scenarios that institutions stress test. The use of this approach was higher among large institutions, where 48 percent reported using it.

Use of stress test information

Almost all institutions used stress testing to report to senior management (90 percent), to report to the board of directors (88 percent), and to understand the institution's risk profile (87 percent). Most institutions also used stress testing in responding to enquiries from rating agencies and regulators (80 percent), triggering further analysis (80 percent), setting limits (76 percent), and conducting strategic planning (65 percent).

¹⁶ Brief Summary of the Dodd-Frank Wall Street Reform and Consumer Protection Act, U.S. Senate, http://banking.senate.gov/public/_files/070110_Dodd_Frank_Wall_Street_Reform_comprehensive_summary_Final.pdf; Financial Services Act 2010, Financial Services Authority, http://www.fsa.gov.uk/Pages/About/Who/Accountability/fsact_2010/index.shtml

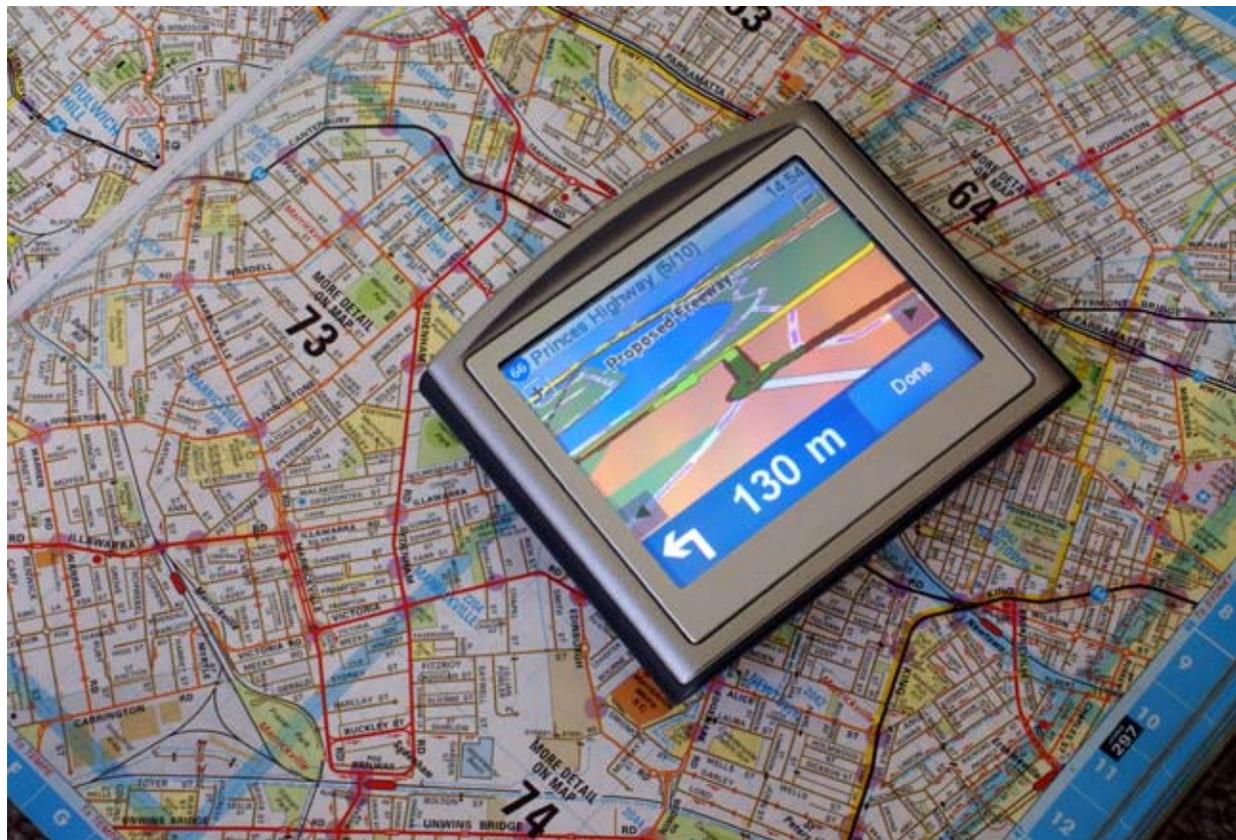
Regulatory and economic capital

Basel II

Basel II was designed to improve the risk sensitivity of an institution's regulatory capital measures and requires improved measurement of credit, market, and operational risk. The survey assessed the progress that institutions have made in implementing Basel II and the impacts that the new requirements have had on their organizations and business models.

Most institutions either have implemented or are now far along in implementing Basel II. Institutions may need to contemplate the prospect of implementing additional substantial changes to comply with Basel III, which was developed in response to the experience of the global

financial crisis. Basel III is designed to provide the financial system with higher levels of tangible capital, more liquidity, and greater transparency.¹⁷ The Basel Committee finalized this framework after the survey was completed. Among new requirements is a minimum Tier 1 common equity ratio of 7 percent of risk weighted assets (4.5 percent to be achieved by 2015, and a further capital conservation buffer of 2.5 percent by 2019). Basel III requires a more stringent definition of Tier 1 capital, requiring it to consist primarily of common equity and retained earnings. Basel III also adopts two liquidity ratios that will require banks to have more sufficient funding and liquidity resources.¹⁸ The new requirements have transition requirements, with final implementation by 2019.



¹⁷ *Basel III: A global regulatory framework for more resilient banks and banking systems* was issued by the Basel Committee on Banking Supervision, December 16, 2010, <http://www.bis.org/publ/bcbs189.htm>

¹⁸ *Basel III: International framework for liquidity risk measurement, standards and monitoring* was issued by the Basel Committee on Banking Supervision, December 16, 2010, <http://www.bis.org/press/p101216.htm>

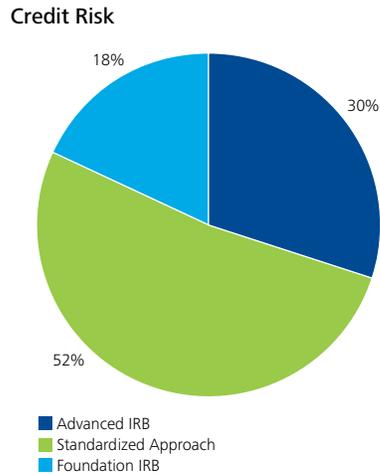
Basel II adoption

Among the institutions participating in the survey, half were subject to the Basel II requirements, while another six percent were not subject to these regulations but have decided to adopt them.¹⁹ Financial institutions in Europe (69 percent), Asia/Pacific (67 percent), and Latin America (63 percent) were more likely to be subject to Basel II than in the United States/Canada (22 percent). The United States/Canada result is no doubt influenced by the decision by U.S. regulators to focus Basel II on larger institutions. Among European institutions, 82 percent were either subject to Basel II or had adopted it voluntarily. Sixty-one percent of global institutions complying with Basel II were planning to implement it outside their home country. These institutions may need to address the implementation challenges that may arise when their home and host regulators have different standards or timelines.

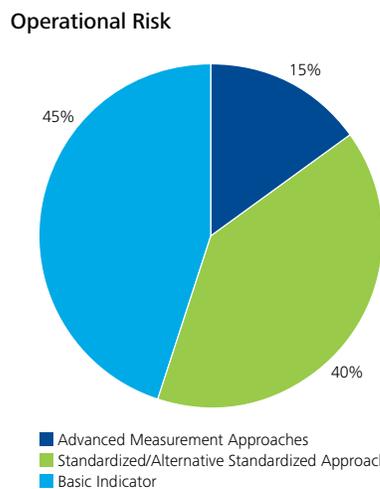
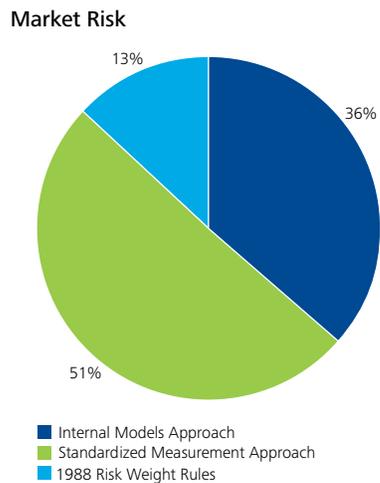
In implementing Basel II, most institutions were using, or intending to use, approaches other than the advanced approaches (see Figure 12). For credit risk, 52 percent of institutions were using the Standardized Approach, while 30 percent have adopted the Advanced Internal Ratings-Based (IRB) Approach. Similarly, 51 percent of institutions have adopted the Standardized Measurement Approach for market risk, while 37 percent have chosen the Internal Models Approach. As expected, large institutions—those with \$100 billion or more in assets—were much more likely to employ the more advanced approaches: Fifty percent used the Advanced IRB for credit risk, and 63 percent used the Internal Models Approach for market risk. Yet, some larger institutions were still following the less advanced approaches; this was especially true for operational risk, where 20 percent of large institutions reported following the Advanced Measurement Approaches.

¹⁹ The remaining questions related to Basel II were asked of institutions that either were subject to Basel II or had adopted Basel II although not subject to it.

Figure 12
Which approach does your organization currently use or intend to use for Basel II on a consolidated basis for credit risk, market risk, and operational risk?



Base: Respondents at institutions subject to Basel II.
Note: Some graphs do not add to 100% due to rounding.

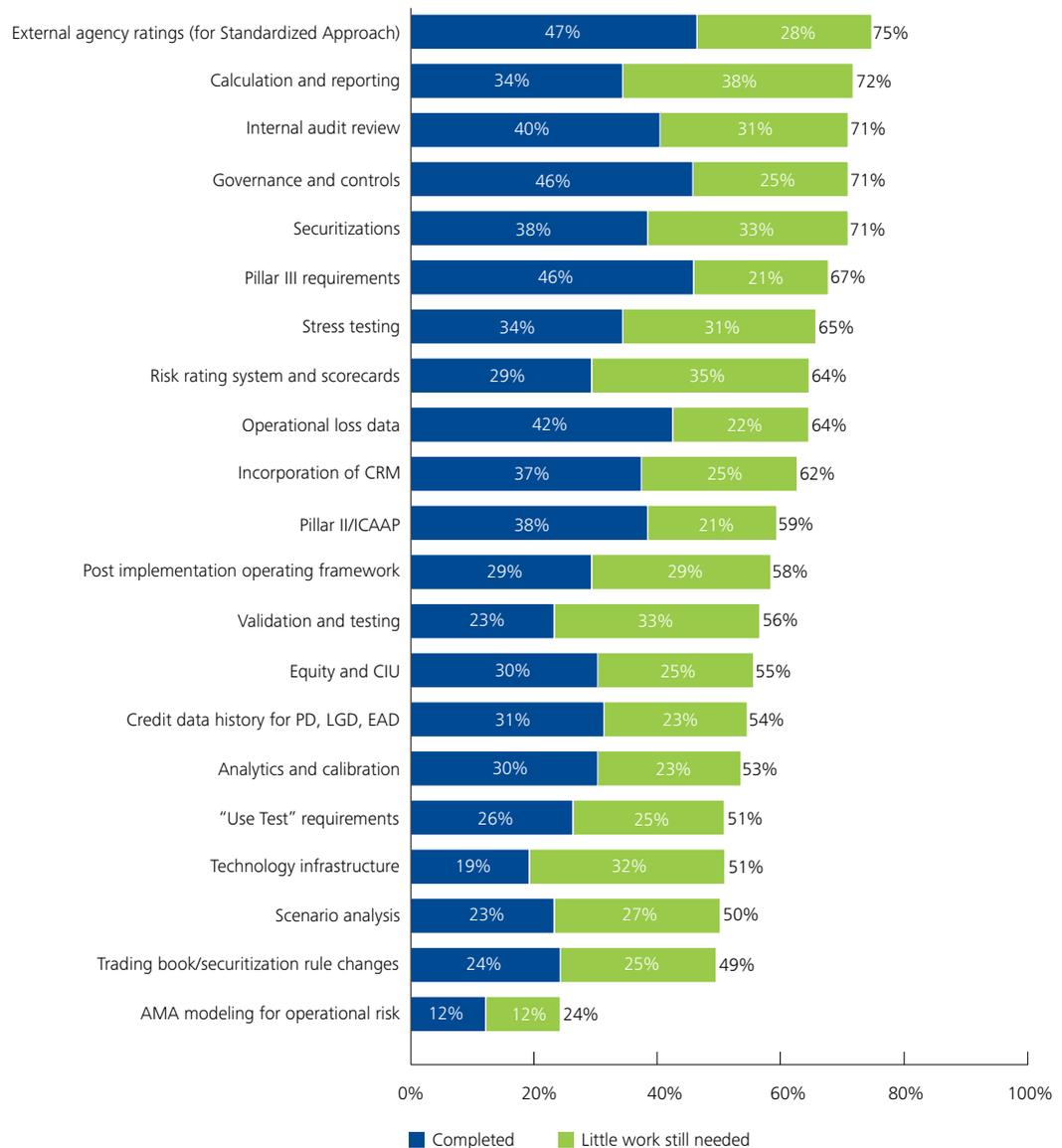


Base: Respondents at institutions subject to Basel II

With the benefit of two additional years since the last Deloitte risk management survey, most institutions were now much farther along in their implementation of Basel II than they were in 2008. Seventy percent or more of institutions reported that work had been completed or is mostly done on external agency ratings (for the

Standardized Approach), calculation and reporting, internal audit review, securitizations, and governance and controls (see Figure 13). For other items, such as scenario analysis, technology infrastructure, and analytics and calibration, about half of the institutions reported having completed most of the required work.

Figure 13
What level of progress has your organization made with respect to implementing each of the following areas for the purposes of Basel II?



Most large institutions have largely completed implementation of many items. Among institutions with \$100 billion or more in assets, about 80 percent or more have completed or mostly completed implementation for risk rating systems and scorecards, governance and controls, "Use Test" requirements, calculation and reporting, securitizations, internal audit review, Pillar III requirements, and equity and Collective Investment Undertakings (CIU).

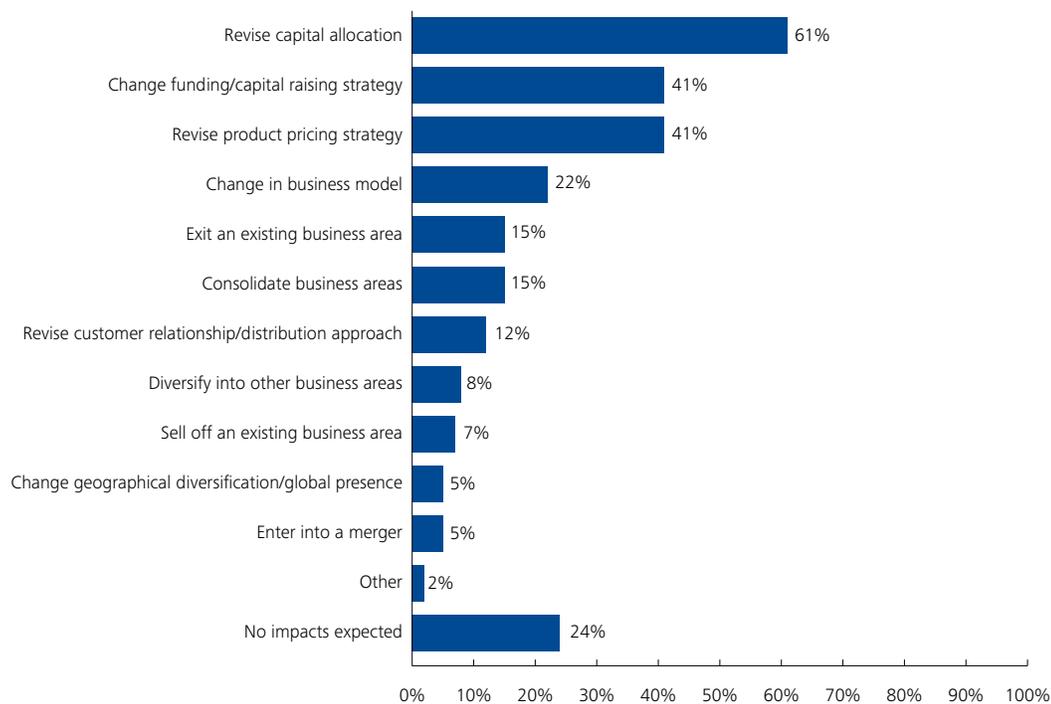
One area where fewer institutions reported progress was in Advanced Measurement Approaches (AMA) modeling for operational risk, which is understandable given the challenges in its implementation. Among all survey participants, 23 percent reported that their work in this area was completed or largely done; even among larger institutions, where more progress might have been anticipated, 29 percent said that work in this area was completely or largely done. Many institutions have found AMA modeling for operational risk to be challenging

because of the significant data requirements, the need to incorporate numerous additional factors into the models, and the testing required.

Impact of Basel II revisions

Many executives expected that the July 2009 Basel II rule revisions addressing capital adequacy and risk management would have important impacts on their institution (see Figure 14). Roughly 60 percent of executives expected the revisions would lead their institutions to revise their capital allocation, while 41 percent each anticipated a change in funding/capital raising strategy and in product pricing strategy. Thirty-two percent of executives believed that the revisions would also have one or more important strategic impacts by leading their institutions to take such actions as changing their business model, exiting an existing business, consolidating business areas, or changing their approach to geographical diversification.

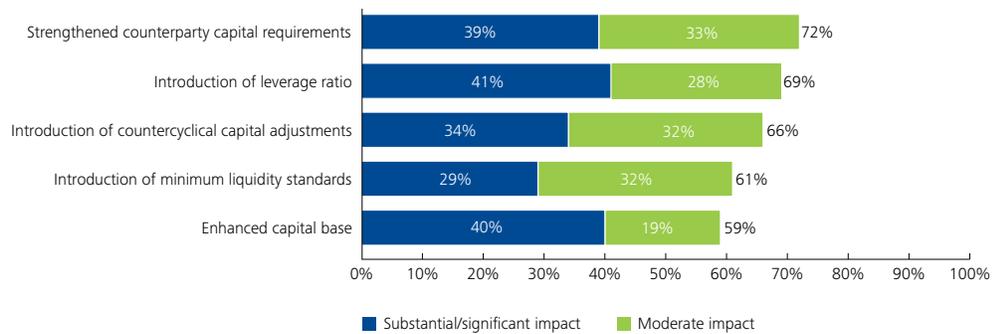
Figure 14
Which impacts do you expect the July 2009, Basel II rule revisions will have on your business?



Note: Percentages total to more than 100% because respondents could make multiple selections.

Figure 15

How much of an impact do you expect each of the following aspects of the regulatory changes proposed by the Basel Committee on Banking Supervision in December 2009 would have on your organization?



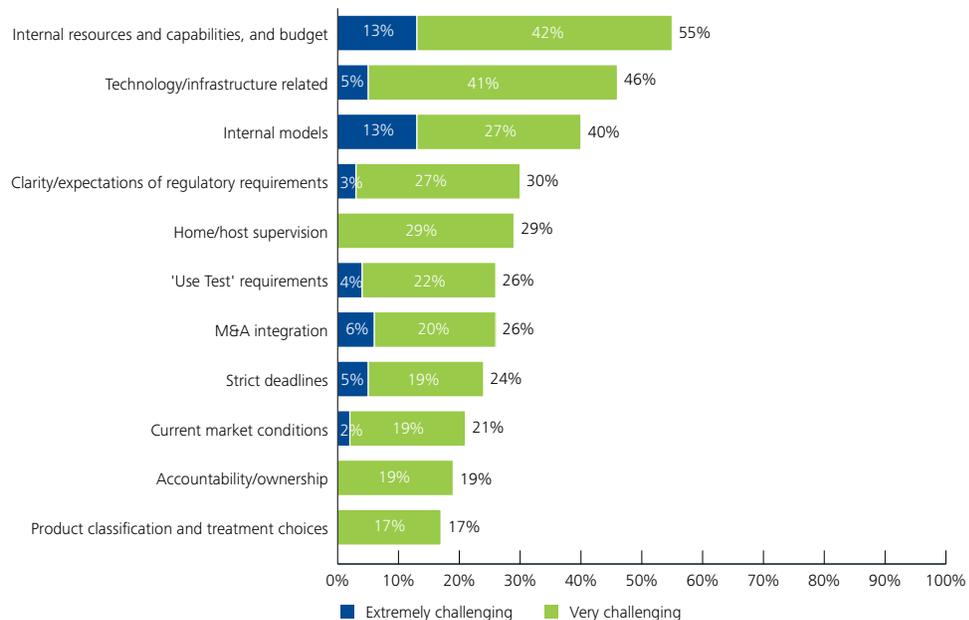
In December 2009, the Basel Committee issued new proposed guidance around tighter capital and liquidity standards in an effort to promote a more resilient banking system, and many executives also anticipated that these would have important impacts. Roughly 40 percent of executives expected that the following proposed changes would have a substantial or significant impact on their institutions—introduction of a leverage ratio, enhancements of the capital base, and strengthened counterparty capital requirements (see Figure 15). Executives at large institutions were more likely to expect significant impacts than were those across the entire survey population, with more than half expecting substantial or significant impacts from an enhanced capital base,

strengthened counterparty capital requirements, introduction of countercyclical capital adjustments, and introduction of minimum liquidity requirements.

Although most institutions were well along in their Basel II implementation, challenges remain (see Figure 16). Implementing Basel II requires significant expertise and resources, as well as having broad impacts on an institution’s infrastructure in such areas as data, technology systems, business processes, analytics, and reporting. The areas that were most often considered by executives to be extremely or very challenging in their Basel II implementation were internal resources and budget (55 percent), technology infrastructure (46 percent), and internal models (40 percent).

Figure 16

How challenging are each of the following issues for your organization in relation to your Basel II implementation effort?



With large institutions more likely to adopt the advanced approaches under Basel II, implementation is even more complex. Among executives from institutions with assets of \$100 billion or more, 65 percent said that obtaining adequate resources, internal capabilities, and budget were extremely or very challenging issues, while 56 percent said the same about technology and infrastructure issues, and 47 percent about developing internal models.

Solvency II

Solvency II is a revised capital adequacy regime developed by European Union regulators that will determine minimum and solvency capital levels for insurers. As with Basel II, it employs a three-pillar approach applied across individual risk categories of market, credit, liquidity, operational, and insurance risk, and is designed to reflect risks more accurately than current capital standards. The Solvency II directive is planned for implementation on October 31, 2012, although currently there is significant discussion of delaying implementation until January 2013.²⁰

Fifty-two percent of the institutions participating were subject to Solvency II requirements or to similar revised regulatory capital requirements. These institutions were asked how they were complying with Solvency II, the challenges they face, and the expected impacts.²¹

Implementation approaches

Most institutions reported that their business units have flexibility in executing the organization's overall strategy for implementing Solvency II—46 percent said they have some flexibility and 29 percent said they have substantial flexibility. For many, the challenge here is finding the right balance—allowing individual business units some flexibility in their approaches to Solvency II implementation while still being able to consolidate capital appropriately and achieve the benefits of diversification at the enterprise level. However, in light of the significance of the “use test” under Solvency II, which requires that an internal model used to determine required capital also be used to make business decisions, business units may need more flexibility to consider, and obtain, the buy in and understanding of management.

Sixty-four percent of institutions said that they are intending to pursue either full or partial internal model approval: Most organizations pursuing this approach have a goal of reducing required capital by better reflecting management's internal view of risks and diversification, rather than being constrained by the requirements of the standard formula. These institutions most often planned to use their internal model as part of their decision-making process for Solvency II in the areas of risk-based



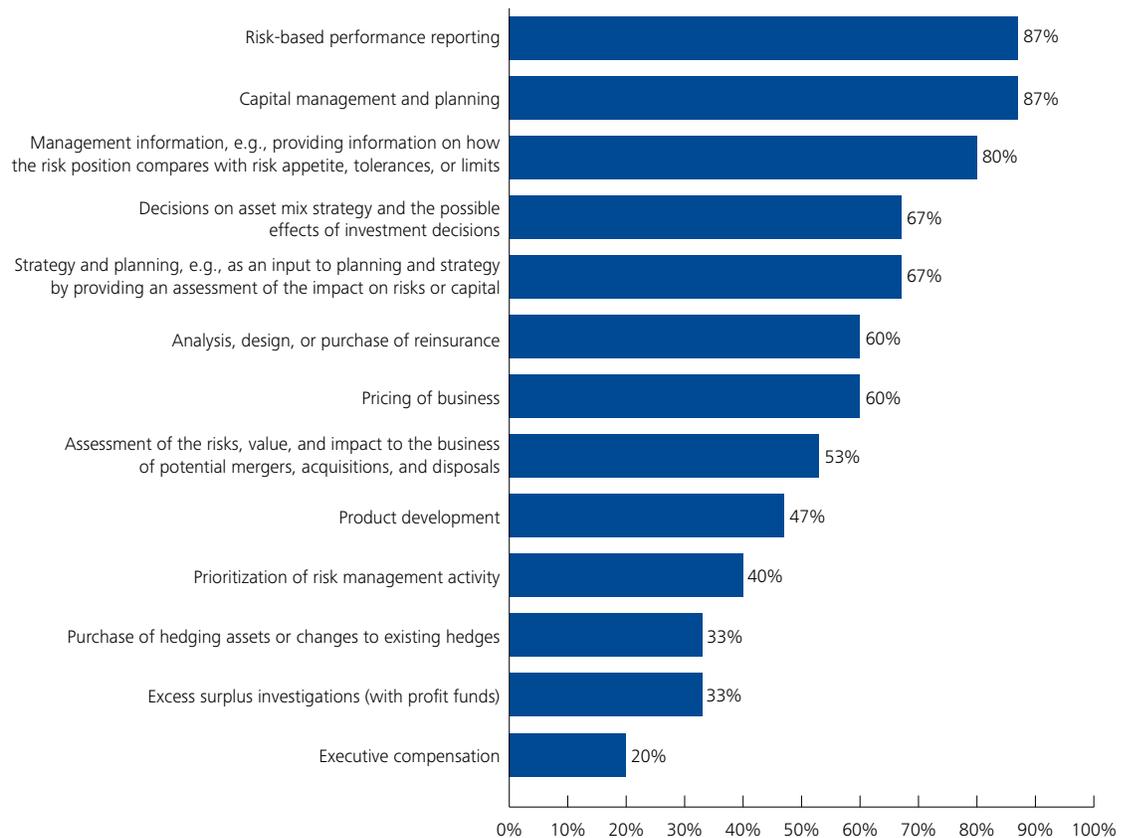
²⁰ *Delivering Solvency II*, Financial Services Authority, June 2010

²¹ The questions related to Solvency II were only asked of institutions that were subject to Solvency II or to equivalent requirements.

performance reporting (87 percent), capital management and planning (87 percent), and management information on risk profile (80 percent), while roughly two-thirds cited decisions on asset mix strategy and also on strategy and planning (see Figure 17). Among the institutions that intended to use internal models for Solvency II, 40 percent planned to use them to prioritize risk management activity

and 20 percent for executive compensation decisions. In particular, the requirements to meet the Solvency II use test, as well as the requirements laid out in Solvency II with respect to the need to embed risk management in executive remuneration, tend to encourage the consideration of internal model results in these areas.

Figure 17
In which areas do you plan to use your internal model as part of the decision-making process for Solvency II?



Base: Companies that provide insurance services and are subject to Solvency II.

Note: Percentages total to more than 100% because respondents could make multiple selections.

Major insurers have established sizeable programs and allocated substantial financial resources to comply with Solvency II. The effort is proving to be a significant challenge for many institutions, with actuarial skills in greatest demand. Looking ahead, the subjects cited most often in the survey as areas of focus for Solvency II implementation over the next 12 months were program initiation, gap analysis, and planning (86 percent); risk governance (71 percent); and Own Risk and Solvency Assessment (ORSA) (71 percent). Roughly 60 percent of institutions also cited the areas of documentation, training, and validation as areas of focus in the coming year. More work may be needed on ORSA for Solvency II, where half the institutions reported that some material risks have not been considered, such as strategic, reputational, liquidity, or operational risks. In our experience, many institutions are currently working to improve the linkage of the ORSA to their business strategy and planning process.

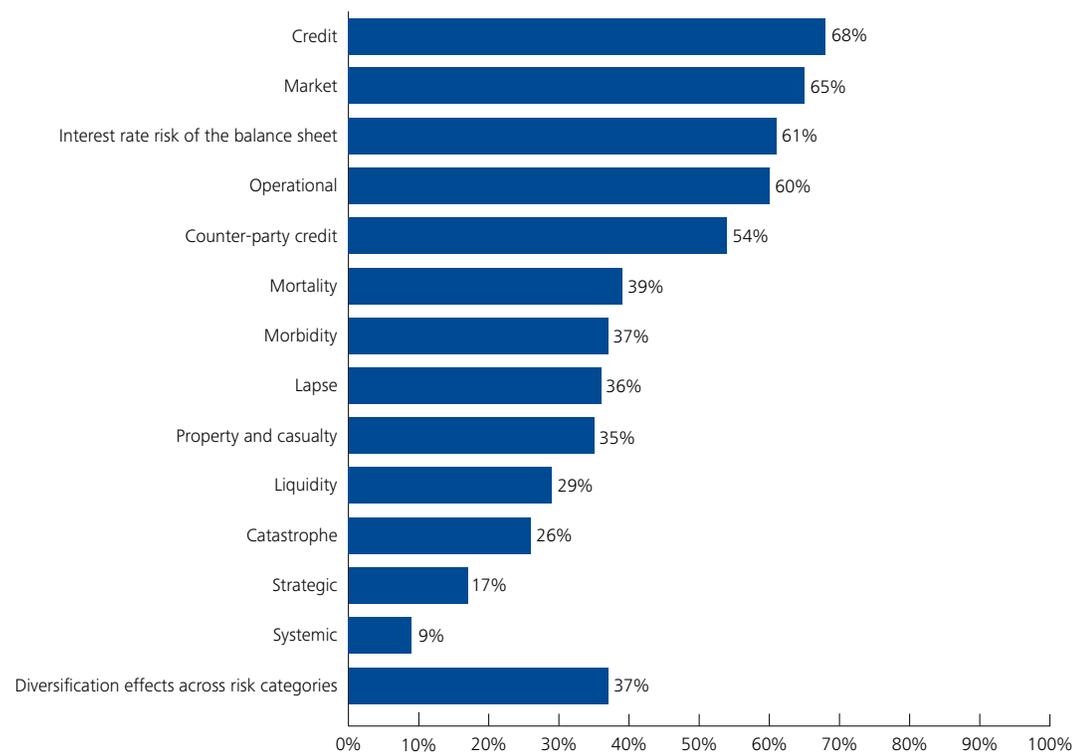
Economic capital

Economic capital reflects an institution's actual risk profile and thus is an important tool for allocating capital and for assessing risk-adjusted performance. Some institutions may calculate economic capital on an enterprise basis, without making separate calculations for individual risk types. Yet institutions, especially larger institutions, may benefit from a more granular understanding of the economic capital associated with each of the major risk categories they face.

Economic capital approaches

The current percentages of institutions that calculate economic capital for different risk types were generally higher than in the 2008 survey; given the importance of economic capital, the overall focus on adequacy of capital structures, and the use of economic capital in Pillar 2 for Basel II and Solvency II, higher percentages were expected (see Figure 18). Institutions were most likely to calculate

Figure 18
For which of the following risk types do you calculate economic capital?



Note: Percentages total to more than 100% because respondents could make multiple selections.

economic capital for credit risk (68 percent), market risk (65 percent), interest rate risk of the balance sheet (61 percent), and operational risk (60 percent). For other important risk types, the percentages of institutions calculating economic capital were much lower. Twenty-nine percent of institutions reported calculating economic capital for liquidity risk and 17 percent for strategic risk.

To gain an assessment of risks across the organization, 60 percent of institutions used a summation approach. Additionally, other approaches to aggregating risks were used—28 percent used variance/covariance approach, 17 percent used the hybrid approach (square root of sum of correlated squares), while roughly 10 percent each used copulas and square root of sum of squares.²² Among large institutions, about one-third used one or more of these techniques.

Use of economic capital

The uses of economic capital are now more widespread than was true in the 2008 survey, ingrained in both risk and broader management arenas and indicating that economic capital is now a more mature technique. In the current survey, 64 percent of institutions used economic capital at the board/senior management level for strategic decision making, and 62 percent at the enterprise level to allocate economic capital, compared to 53 percent and 56 percent, respectively, in 2008. Similarly, roughly 45 percent used economic capital at the transaction level for risk-based pricing and at the desk/product level for risk/return optimization of product mix, up from about 30 percent each in 2008. While the use of economic capital in compensation decisions was reported at 30 percent of institutions, this was double the figure of 15 percent in 2008.

Large institutions reported making more use of economic capital in their decision making. Among institutions with \$100 billion or more in assets, 77 percent used it at the enterprise level to evaluate/allocate economic capital, 74 percent for strategic decision making by the board and

senior management, 65 percent at the business unit level to evaluate risk-adjusted performance, and 40 percent to make compensation decisions.

Economic capital was also used more widely by institutions in Europe than by those in other regions. For example, 77 percent of European institutions used economic capital for strategic decision making at the level of the board of directors and senior management, compared with 63 percent in Asia/Pacific and 48 percent in the United States/Canada. Similarly, economic capital was used by 47 percent of European institutions in compensation decisions, while it was used in this way by only 26 percent of institutions in Asia/Pacific and 23 percent of institutions in the United States/Canada. The responsibility for reviewing and approving economic capital reporting and results was placed with the board of directors at 47 percent of institutions, while 23 percent chose senior management. The remaining 30 percent placed this responsibility with functional groups, such as finance or risk management. Given its importance, one would expect the responsibility to review economic capital reporting and approve results would be placed with the board of directors or senior management.

Economic compared to regulatory capital

Economic capital was now reported as greater than regulatory capital at most institutions, in contrast to survey results in 2008. Sixty-three percent of institutions reported that economic capital was higher than regulatory capital, up from 46 percent in 2008, and 26 percent said that regulatory capital was greater, a drop from 42 percent in the prior survey. This shift towards higher economic capital is consistent with a better recognition by many institutions of the greater risk associated with their businesses due to economic cycle factors: Economic capital levels are typically more volatile and sensitive to risk conditions, while regulatory capital tends to be more stable. It may be, too, that institutions have generally strengthened the coverage and assumptions in their economic capital models during the recent period.

²² Percentages total to more than 100% because respondents could make multiple selections.

Management of key risks

Effectiveness of risk management

Institutions should not only consider traditional risk categories, such as market, credit, liquidity, and operational risk, but also a broader array of risk types that are now gaining greater prominence. These risks should be considered in the context of recent turmoil in the financial markets, a reduced risk appetite among many institutions, and greater scrutiny of the effectiveness of risk management programs by the regulators. In this rapidly shifting landscape, 66 percent of executives considered their institution to be extremely or very effective in risk management overall. Perhaps because they have more resources at hand, executives at larger institutions were more likely to feel their risk management programs were effective—75 percent rated them as extremely or very

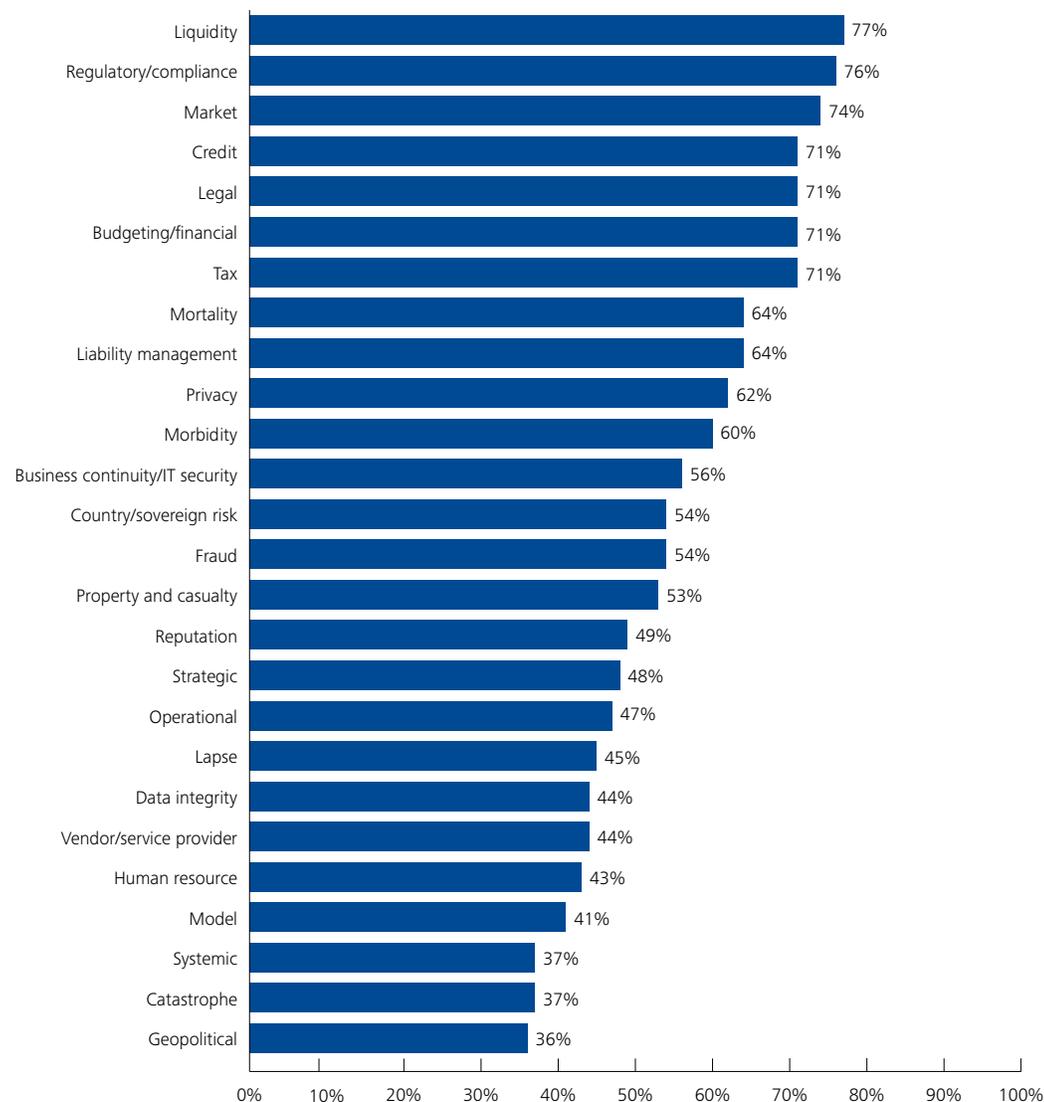
effective, compared with a lesser 61 percent of those at institutions with less than \$10 billion in assets.

The survey also asked executives about their institutions' effectiveness in managing 26 individual risk types, both traditional and emerging risks. Roughly three quarters of executives believed their institutions were extremely or very effective in managing market, credit, and liquidity risk, similar to the ratings in 2008. Regulatory/compliance risk is assuming greater importance as many regulatory authorities around the world are implementing more stringent supervisory requirements, and 76 percent of executives considered their institution to be very effective in managing this risk (see Figure 19).

Figure 19

How effective do you think your organization is in managing each of the following types of risks?

Percent responding extremely or very effective



Note: Percentages total to more than 100% because respondents could make multiple selections.

Several risks that became more apparent in the global financial crisis continue to present challenges for most institutions. Forty-four percent of executives rated their institution as extremely or very effective in managing risks due to problems with data integrity, and 41 percent rated their institution highly for managing model risk. At the individual institution level, there may be difficulty in addressing systemic risk; however, 37 percent of executives indicated steps were being taken to do so and considered their institution to be extremely or very effective in managing this risk type.

Credit risk

The global financial crisis led to large credit losses being incurred in some segments of the market, although these losses appear to have been abating over the last year. The 2010 review of large syndicated credits by U.S. regulators concluded that credit quality in the United States remained weak, although the volume of criticized loans decreased by more than 30 percent from the record levels reported in 2009.²³ In Europe, concerns about sovereign debt and potential sovereign defaults have galvanized attention, as well as having knock-on effects to individual financial institutions. In the United States, precarious finances among state governments and their potential impact on municipal debt markets are starting to gain attention. In China and some of the other developing markets, there is concern about the potential for asset bubbles and the future fallout on loan collateral if asset bubbles do form and then correct themselves.

Credit risk management roles and responsibilities

The credit risk function has a broad mandate, and as the survey results show, the mandate is increasing. Views in the industry on the role of credit risk management are not consistent, and there are different roles and operating models. Because many of the losses sustained by financial institutions over the past three years were a result of write-downs in their investment and trading portfolios, the credit risk management function in many institutions has extended its focus to include both issuer and counterparty risk. Credit risk management responsibilities increasingly include issuer and counterparty measurement, limit setting, and reporting. Such activities help provide enterprise-wide control of credit exposure that includes the totality of credit risk, encompassing loans, investments, and off-balance instruments.

At least half the institutions participating in the survey included 10 different areas as primary responsibilities of

their institution's credit risk management function. The items cited most often as primary responsibilities were risk identification, analytics, and reporting (80 percent); developing and implementing the risk management framework, methodologies, and standards (76 percent); monitoring risk exposures (74 percent); and escalating risk issues to the CEO and the board of directors where appropriate (71 percent).

Credit risk mitigation

For underlying and issuer credit risk, the most commonly used credit risk mitigation tools were collateral (65 percent), guarantees (60 percent), the default management process (48 percent), and syndication and participation (45 percent). Among survey respondents, 34 percent of institution used credit derivatives as a credit risk mitigation tool, although 57 percent of institutions with \$100 billion or more in assets did so. The survey found a significant increase since 2008 in the use of several credit risk mitigation tools for counterparty credit risk. The use of collateral jumped to 88 percent of institutions from 54 percent in 2008, while the use of guarantees rose to 65 percent from 45 percent, and the use of syndication and participation (e.g., whole loan sales) rose to 47 percent from 34 percent.

Credit risk measurement

In measuring counterparty credit exposures, institutions are using a number of techniques, more than were observed in the 2008 survey. For measuring counterparty credit risk, the use of principal/notional (e.g., by industry, sector, or geography) increased to 81 percent of institutions from 61 percent in 2008, the sum of potential exposures for individual transactions jumped to 75 percent from 51 percent, and potential exposure by counterparty/issuer using analytical method to 62 percent from 48 percent.

For assessing underlying and issuer credit risk, the most common approach was principal/notional, used by 79 percent of institutions, an increase from 69 percent in 2008. However, there were a number of additional analytics that were included in the 2010 survey for the first time that were widely used—probability of default (65 percent), loss given default (63 percent), and exposure at default (60 percent). These analytics allow institutions to assess credit risk and are consistent with the efforts by many institutions to employ economic capital and to comply with the requirements of Basel II. A continuing area of credit risk measurement development is the ability of institutions to get a complete, single view of customer exposure across different regions, product areas, business units, and legal entities.

²³ *Shared National Credits Program: 2010 Review*, Board of Governors of the Federal Reserve System, Federal Deposit Insurance Corporation, Office of the Comptroller of the Currency, and Office of Thrift Supervision, September 2010

Stress testing across the enterprise has evolved and become much more robust for us, coming through our Basel II implementation. We've improved the rigor of our stress testing and now work through numerous variables and correlations to arrive at a comprehensive set of scenarios; these help drive our capital planning process and are a central feature of quarterly reporting to the board risk committee.

— Chief risk officer, global bank

Credit risk stress testing

Stress testing is an important tool that tests the resiliency of the institution in the face of adverse economic and market conditions, and it is increasingly an area of focus by the regulators in determining capital adequacy. Eighty-eight percent of institutions reported using stress tests for risk factors affecting the credit portfolio, an increase from 79 percent in 2008. Among institutions that employed stress testing for their credit portfolio, 78 percent employed them for default rates by underlying factors, 69 percent for interest rate changes, and 62 percent for recovery rates, all higher than in 2008. Stress testing was even more common among institutions with \$100 billion or more in assets: Ninety-seven percent used them for default rates by underlying factors and 72 percent for recovery rates.

Thirty-three percent of institutions used stress testing for correlation risks, although 52 percent of large institutions did; this is an application of stress testing that more institutions may wish to consider. However, there are difficulties in employing stress tests to correlation risks: Correlation data is difficult to obtain in the first place, and the historical series of correlation results required to formulate relevant stress tests are more difficult still.

Market risk

Value at risk (VaR)

The propriety of various tools to manage market risk has been under intense scrutiny. VaR has been a widely used tool to assess risk but has come under criticism, especially when used alone. By focusing on the potential volatility in a portfolio at some predefined percentage of the time, such as 99 percent, VaR has been criticized for not focusing on so-called tail or "Black Swan" events, which are rare but can have devastating impacts when they occur. Further, because VaR is often based on a normal distribution, it may underestimate how often such events may occur.

Institutions in the current survey were using VaR somewhat less often than in 2008 for various asset classes. Sixty-four percent of institutions reported that VaR extensively covered fixed income, down from 73 percent in 2008, while 25 percent said it extensively covered asset-backed securities and structured products, down from 38 percent. Among those using VaR, more institutions were using a variety of specific VaR methodologies. The percentage of institutions using historical simulation with full revaluation rose to 54 percent from 46 percent in 2008, while the percent using variance/covariance based on first-order Greeks rose to 38 percent from 31 percent.

However, there may well be new demands for the use of VaR. The new rules for separation of over-the-counter (OTC) derivatives businesses in the Dodd-Frank legislation in the United States, and that have been proposed in Europe, will require institutions to be able to calculate market risk measures such as VaR for the entities into which OTC derivatives will be transferred.

Market risk stress testing

Some have recommended that institutions supplement VaR with stress testing. The Basel Committee's publication, *Principles for sound stress testing practices and supervision*, addressed this, stating: "Stress testing should provide a complementary and independent risk perspective to other risk management tools such as value-at-risk (VaR) and economic capital. Stress tests should complement risk management approaches that are based on complex, quantitative models using backward looking data and estimated statistical relationships. In particular, stress testing outcomes for a particular portfolio can provide insights about the validity of statistical models at high confidence intervals, for example those used to determine VaR."²⁴

²⁴ *Principles for sound stress testing practices and supervision*, Basel Committee on Banking Supervision, May 2009.

Among the survey participants, 74 percent of institutions conducted stress tests for the trading book and 51 percent for the structured products book. Larger institutions were much more likely to conduct stress tests for the structured products book; 91 percent of institutions with \$100 billion or more did so, compared with 31 percent of institutions with assets of \$10 billion or less and 43 percent of institutions with assets of \$10 billion to \$100 billion.

Price verification function

Institutions with price-sensitive positions may consider establishing an independent price verification function. There has been increased interest in price verification across financial services institutions that need to value assets (or pools of assets) periodically—in particular in securities, banking, and investment management, but also in insurance. The market turmoil from the global financial crisis has led to more attention on this issue from regulators and others. The focus has been on the need for a price verification function that is independent—in other words, with reporting lines that are independent of those for the primary valuation process.

Eighty-six percent of institutions reported having such an independent price verification function, including 93 percent of institutions with \$100 billion or more in assets. Forty percent of institutions located this function in their risk management organization, while 24 percent placed it in product controllers/finance. Eighteen percent of institutions reported locating this function in the middle office, down from 21 percent in 2008, while only seven percent placed it in the back office, down from 12 percent in 2008.

Model validation function

Model validation is a key activity to help assess whether models function as intended, both when they are implemented and over time. Ongoing monitoring and validation of risk management models are important in

order to assess a model's sensitivity to structural changes and to changes in parameters and assumptions.²⁵ Fifty-nine percent of institutions reported having a model validation function, an increase from 53 percent in 2008. Larger institutions were more likely to have a model validation function, with 79 percent of institutions with more than \$100 billion in assets having such a function, up from 66% in 2008.

Model validation was most often placed in an independent risk management function. Among institutions with a model validation function, 65 percent reported that model validation resides within independent risk management, while 19 percent placed it within internal audit and eight percent within the actuarial function. Larger institutions were even more likely to have risk management handle model validation. Among institutions with more than \$100 billion in assets, 77 percent said that model validation responsibility was placed within independent risk management.

Liquidity risk and asset liability management

Since the global financial crisis, the need for stronger liquidity risk management has been recognized as never before. Large liquidity buffers have been accumulated by many financial institutions, and there has been a shift by some from shorter-term wholesale sources of funding to longer-term and more stable funding bases, such as from deposit taking.

Liquidity risk management has been a focus of regulators, with many institutions continuing to enhance their liquidity risk management tools, policies, and procedures as a result. Institutions are recognizing that the scenarios and assumptions used for liquidity also need to be as rigorous as those used for capital planning purposes, with some establishing consistent economic scenarios and assumptions across capital and liquidity.

There's a whole new action plan being rolled out in response to increasing needs around managing liquidity risk...new policies, new contingency planning, new indicators, and new reporting—all to help very actively manage diversifying the sources and types of leverage.

— Managing director, risk management, asset management firm

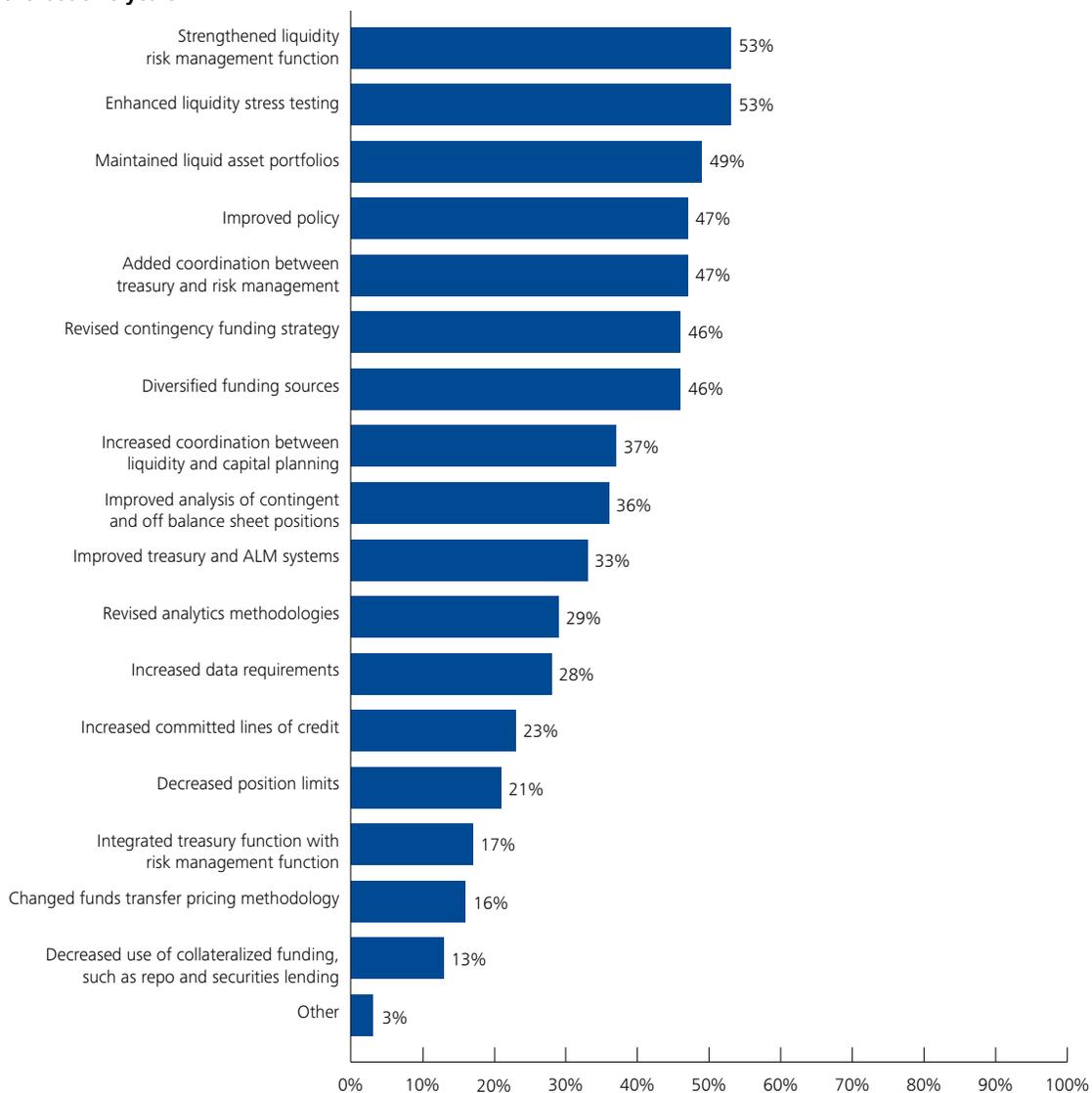
²⁵ "Implementation of Credit Risk Rating Models," Deloitte Development LLC, April 2008

Roughly three-quarters of institutions surveyed have taken a wide array of actions over the last two years in response to the liquidity environment. The most common responses, each chosen by roughly half of these institutions, were strengthening their liquidity risk management function, enhancing liquidity stress testing, maintaining liquid asset portfolios, improving liquidity management policy, increased coordination between treasury and risk management, revised contingency funding strategy, and diversifying funding sources (see Figure 20). In some areas, large institutions were much more likely to have taken action: Fifty-four percent of institutions with \$100 billion or more in assets have increased coordination between liquidity and capital planning (compared with 37 percent of all institutions),

and half have improved their analysis of contingent and off-balance sheet positions (versus 36 percent of all institutions).

Both financial institutions and regulators are assessing the liquidity difficulties experienced during the global financial crisis. Basel III will significantly enhance liquidity requirements by instituting new liquidity ratios and requiring that institutions have more sufficient funding and liquidity resources. The nature of the new rules will become clearer over time as regulators finalize the details of the new requirements. Many institutions will likely have to complete significant work to upgrade their liquidity risk management systems and capabilities and comply with these new regulations.

Figure 20
Which of the following steps has your organization taken in response to the liquidity environment over the last two years?



Asset liability management

Institutions participating in the survey performed various analyses for asset liability management (ALM) purposes with varying degrees of frequency. For liquidity scenarios, 28 percent of institutions conducted these analyses daily and 11 percent weekly, with 61 percent that conducted them monthly or less often. Gap analysis was conducted either daily or weekly by 36 percent of institutions, while 64 percent conducted them less often. When it comes to other important types of ALM analyses, roughly three-quarters of institutions reported that they conduct them monthly or less often; this applied to earnings at risk, equity at risk, sensitivity analysis of net interest income, and sensitivity analysis of economic value of equity. There can be difficulties managing capital and funding structures during periods of market turmoil, and obtaining information in order to do so; therefore, institutions that conduct these analyses for ALM monthly, or even only quarterly or annually, may consider conducting them more frequently.

Insurance risk

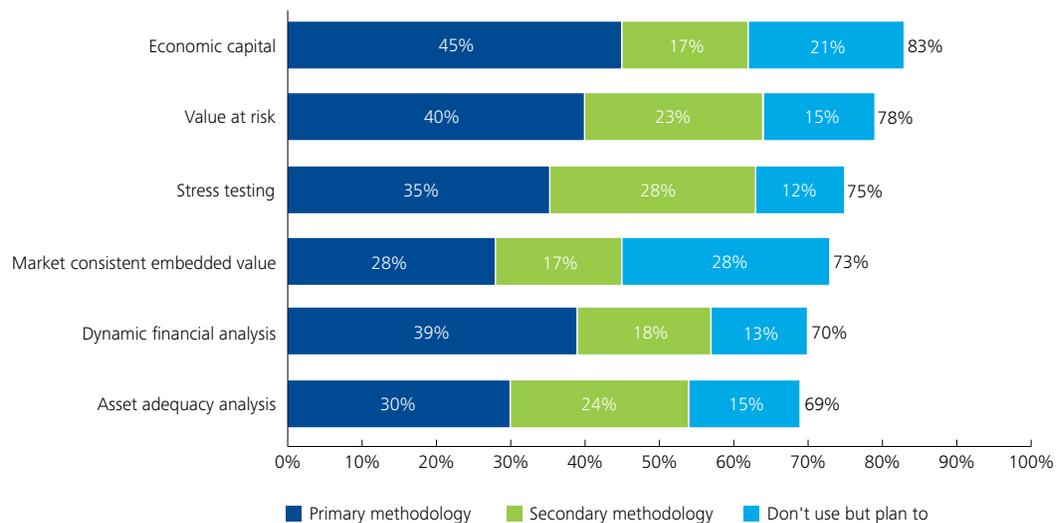
Institutions that provide insurance products were asked several questions on insurance risk. In the survey, 17 percent of institutions reported insurance as their primary business, with life insurance being the most common sector (11 percent). In addition, 34 percent of institutions reported that they provide insurance products, although insurance was not their primary business.

Insurers that follow a traditional business model based on generating premiums, rather than those that engage in other financial activities, such as selling credit protection in the CDS market, may be in a more liquid position than other institutions. Yet, insurers do face risk management challenges resulting from the nature of their products, such as the risks associated with variable annuity products. Maintaining effective management of liquidity risk, managing and establishing limits for counterparty risk, and being able to aggregate risks across the organization are important.²⁶

Institutions reported using a variety of techniques to assess insurance risk. Several methods were cited by roughly 60 percent of institutions as either a primary or a secondary methodology—stress testing, VaR, economic capital, and dynamic financial analysis. No one method dominated, and many institutions used more than one method (see Figure 21). These methodologies can overlap because analyses of economic capital often encompass stress testing and VaR, and market-consistent embedded value is the underlying framework used for economic capital at many life insurance institutions.

Most institutions providing insurance products reported using stress testing to assess insurance risk. Seventy-two percent of institutions used stress testing for mortality risk, while 66 percent employed it for lapse risk, 63 percent for morbidity risk, and 59 percent for expense risk.

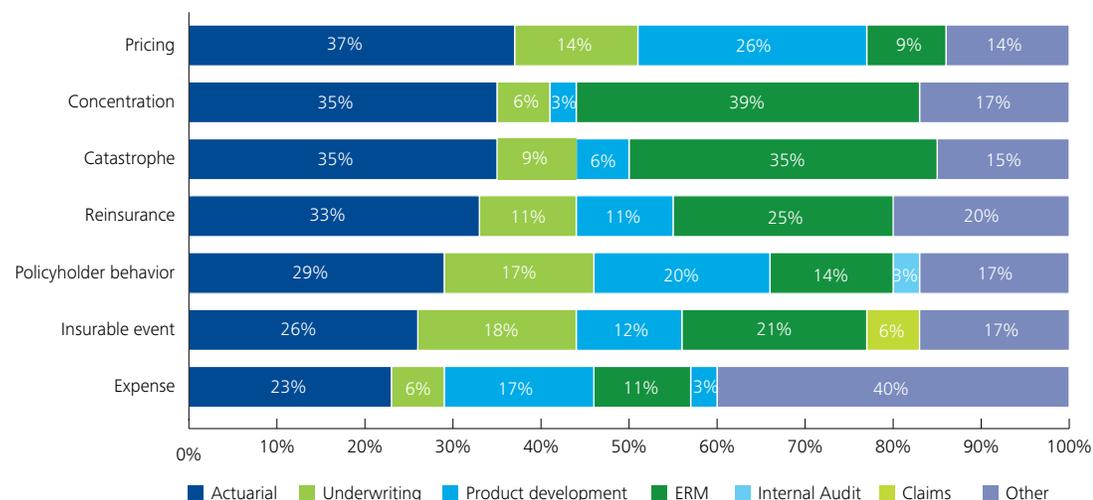
Figure 21
To what extent does your company use the following methods to assess insurance risk?



²⁶ Dr. Robert W. Klein, et al., "The Financial Crisis and Lessons for Insurers," CAS, SIA, SOA Joint Risk Management Section, SOA Committee on Finance Research, Society of Actuaries, September 2009

Figure 22

Who in the organization has primary responsibility for managing each of the following types of insurance risk?



Note: Some graphs do not add to 100% due to rounding.

Institutions used a variety of organizational structures for overseeing insurance risks, with no function being named by more than 39 percent of institutions for any risk type. For example, for pricing risk, 37 percent of institutions said the primary responsibility was placed with actuarial, while 26 percent cited product development, and lesser percentages named other areas (see Figure 22). One potential challenge in interpreting responses to this question is that depending on an institution’s structure, there may not be a separate and distinct actuarial department, with actuaries instead residing within ERM, product development, and other areas.

For concentration risk, 39 percent named ERM, while 35 percent cited actuarial and the remainder placed the responsibility in other functions. The higher proportion of institutions placing responsibility for concentration risk within the ERM function may be leveraging the ERM function’s ability to aggregate and analyze risk information across the enterprise.

Operational risk

Although institutions have always managed operational risks, the importance of operational risk management was made a greater priority by the inclusion of operational risk in the Basel II capital framework. As a result, many institutions have major programs for operational risk in place. However, these regulatory-driven operational risk efforts are typically

focused more on measurement and capital than on helping institutions proactively identify and manage operational risk, such as those resulting from model risk. (See “Effectiveness of risk management” in this report for a discussion of the survey results on model risk.) In addition, while some institutions have done so, many have not integrated operational risk management with related programs, such as Sarbanes-Oxley and regulatory compliance.

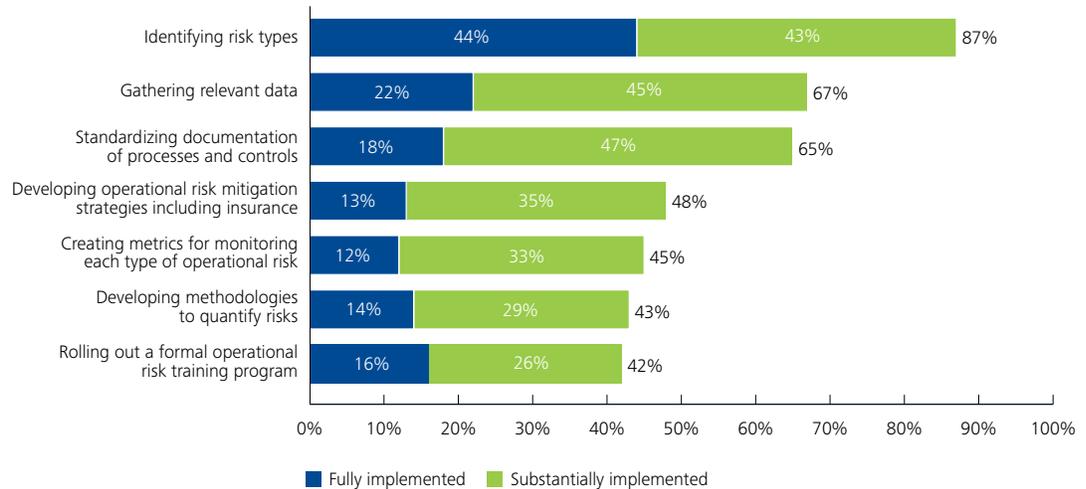
Although operational risks can potentially have major negative impacts on an institution’s reputation, they have typically not received as much attention from senior management and boards of directors as other risks; the impacts of the global financial crisis from credit, market, and liquidity risk events may have further reduced the relative priority placed on managing operational risk. Yet, although individual operational risk events may be small, in the aggregate they can be substantial.

Operational risk implementation progress

Institutions have made progress in some areas. When asked about the implementation of various aspects of operational risk management, 87 percent of institutions reported that they had either fully or substantially completed the work of identifying risk types, while 67 percent said the same about gathering relevant data and 65 percent about standardizing the documentation of processes and controls (see Figure 23).

Figure 23

To what extent has your organization implemented the following aspects of operational risk management?



However, in other areas less than half the institutions have largely completed implementation: creating metrics for monitoring each type of operational risk, rolling out a formal training program for operational risk, and developing methodologies to quantify risk.

Because AMA modeling includes these areas as requirements, these lower percentages are consistent with the fact that only 23 percent of institutions said their work under Basel II on AMA modeling was completed or largely done. (See the “Basel II” section of this report.) Large institutions have not done as much work in some areas, perhaps due to the complexity of the task of managing operational risk in complex organizations. While 67 percent of all institutions have completed or substantially completed the work of gathering relevant data, the figure was 60 percent among institutions with \$100 billion or more in assets. Thirty-seven percent of large institutions have largely completed the work of developing operational risk mitigation strategies.

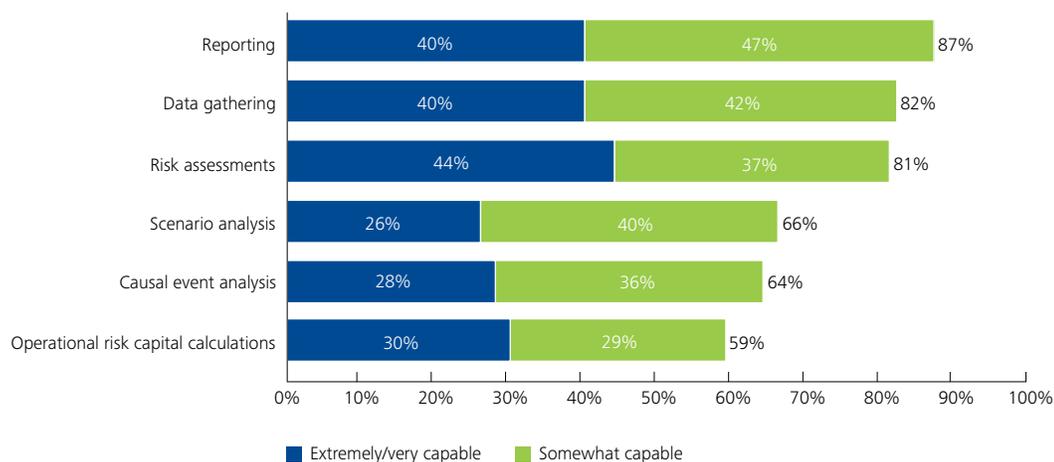
Based on Deloitte’s risk management surveys, progress has been made on implementing operational risk methodologies since 2008. Sixty-one percent of executives rated their risk assessments, and 54 percent rated their internal loss event data, as extremely or very well developed, compared with roughly 40 percent for each two years ago. For key risk indicators, 30 percent of executives considered them to be well developed in 2010, compared with only 12 percent in 2008.

The use of scenario analysis for operational risk was widespread. Roughly two-thirds of institutions reported conducting scenario analysis for operational risk at the enterprise level and the business unit level, 56 percent did so at the level of risk type, and roughly one-third did so at the trading desk level and at the level of product type. Among institutions that employed a scenario analysis methodology for operational risk, either quantitative or a mix of quantitative and qualitative scenario analysis was used by roughly three-quarters for risk type, product type, business unit and enterprise levels, and by 83% for the trading desk or equivalent unit level.

In 2010, executives believed their technology systems for operational risk management were more capable in several areas than they did in 2008. Forty-four percent of executives considered their technology systems to be extremely or very capable in supporting operational risk assessments, up from 23 percent in 2008. Forty percent gave this rating to their capabilities in data gathering compared to 27 percent in the last survey (see Figure 24).

Figure 24

How capable are your organization's operational risk management technology platforms in the following areas?



Although only about one-quarter of executives each considered their risk management systems for scenario analysis and for causal event analysis to be extremely or very capable, this was roughly double the percentages seen in the 2008 survey. Generally increasing capabilities in operational risk management technology platforms were expected given the continued development of operational risk capabilities in the industry and the fact that most institutions are now well along in implementing Basel II.

With operational risk capital models becoming more developed as institutions implement Basel II, institutions are including more inputs into those models. Traditionally, operational risk capital models have been largely based on internal loss data, but increasingly, institutions are including a wider array of factors. In the survey population, the most common inputs to operational risk capital models were internal loss data and risk self assessments, each cited by 74 percent of institutions. Roughly half the institutions used key risk indicators and scenario analysis. Institutions are also now using a wider range of inputs to their operational risk capital models than in 2008. Seventy-four percent of institutions reported using risk self assessments, up from 60 percent in 2008; 56 percent use scenario analysis and 55 percent use key risk indicators and scenario analysis, as compared to 39 percent in 2008; 45 percent use internal audit scores, while 22 percent did so in 2008.

Regulatory risk

The global financial crisis unleashed a tidal wave of regulatory change. Regulations have been introduced or made more stringent, regulatory authorities have received new powers, and new regulatory bodies have been created.

The Dodd-Frank Act, which was signed into law in the United States in July 2010, constitutes the most fundamental change to the U.S. regulatory regime since the 1930s. With the overall goal of reducing risk in the financial system and increasing protections for consumers, the provisions of the Dodd-Frank Act include the following:

- A new Financial Stability Oversight Council will monitor and respond to risks to the financial system as a whole.
- A new Office of Financial Research will have the responsibility to collect and analyze systemic financial information for the regulatory agencies.
- Institutions that are designated as systemically important, including nonbanks, are subject to new information and reporting provisions and required to create a "living will" for their orderly dissolution in case they should fail.
- Banks, their affiliates, and holding companies face new restrictions on proprietary trading and on investments in hedge funds and private equity funds.
- Many derivatives are required to be traded and cleared on exchanges.
- Institutions are required to have a risk management expert as a member of the board risk management committee.
- A new Consumer Financial Protection Bureau within the Federal Reserve consolidates the consumer protection responsibilities previously handled by several regulatory agencies. The new agency has the authority to write new rules for consumer protection that will govern all financial institutions, both banks and nonbanks, offering financial products to consumers.

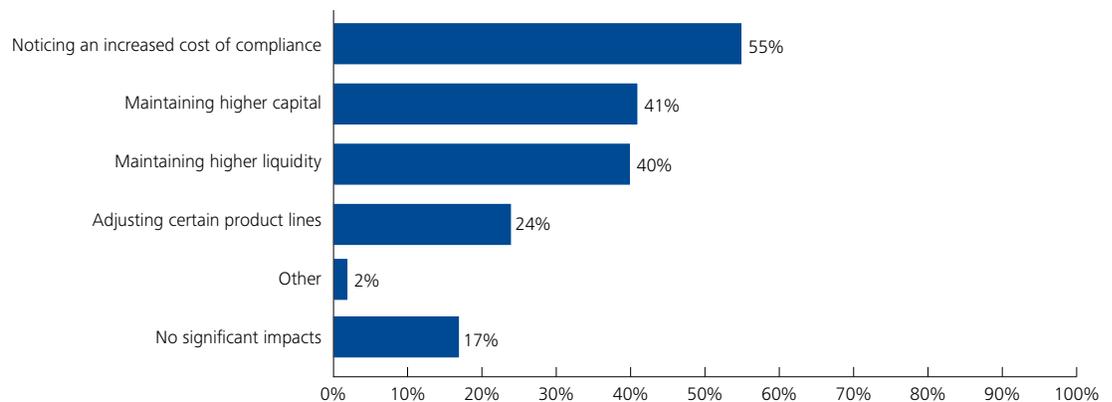
In June 2010, the government in the United Kingdom announced that it would abolish the FSA and place its prudential regulatory authority with a new subsidiary of the Bank of England, which will be given new authority to address systemic risk issues.²⁷ A new Consumer Protection and Markets Authority will be created to regulate institutions providing financial services to consumers. The European Commission announced legislative proposals to regulate over-the-counter derivatives markets, including establishing a central counterparty clearing mechanism.²⁸

The impacts on the financial industry could be even greater from the series of revisions introduced by the Basel Committee on Banking Supervision. Since the global financial crisis, funding structure and liquidity management have become major areas of focus by the regulators and also an important component of Basel III. Regulators are examining whether nonbank entities have direct access to third-party sources of funding, or whether they are funded centrally, leading to the risk of double leverage. The Basel III rules introduce a global liquidity standard to supplement capital regulation, with higher levels of capital and higher liquidity ratios, among its other provisions. In December 2009, the committee issued two consultative papers that proposed additional changes in the areas of leverage ratios, counterparty credit risk, capital ratios, and systemic risk. The capital levels may also vary by individual countries. While many countries may believe that the Basel III capital levels are adequate, other countries may choose to require an additional capital requirement for their large institutions.

For example, the Expert Commission in Switzerland, formed to examine regulation of systemically important financial institutions, issued a white paper on September 30, 2010, that recommended that these institutions be required to hold a minimum of 10 percent of assets in common equity, compared to seven percent under Basel III.²⁹ In July 2009, the Basel Committee approved several regulatory revisions to its rules governing capital adequacy, risk management, and corporate governance. For insurers, the European Union has introduced Solvency II, a revised capital adequacy regime that will establish minimum solvency requirements. (See “Regulatory and Economic Capital.”)

These regulatory developments are expected to have important impacts, many of which cannot be anticipated today. In the survey, more than 80 percent of institutions have already experienced significant impacts on their business from regulatory reform in the countries where they operate (see Figure 25). More than half the institutions reported that their compliance costs have risen, while roughly 40 percent cited the need to maintain both higher capital and higher liquidity. Roughly one quarter of the institutions have also had to adjust certain of their products in order to meet regulatory requirements.³⁰ Large institutions were even more likely to have experienced significant impacts from regulatory changes, with 63 percent maintaining higher levels of capital and 56 percent maintaining higher levels of liquidity.

Figure 25
Which of the following impacts on your business have resulted from regulatory reform in the major jurisdictions where you operate?



Note: Percentages total to more than 100% because respondents could make multiple selections.

²⁷ Toney Bonsignore, “FSA Axed and Bank of England Beefed Up in Regulatory Shake-Up,” City Wire, June 17, 2010, <http://citywire.co.uk/money/fsa-axed-and-bank-of-england-beefed-up-in-regulatory-shake-up/a407635>

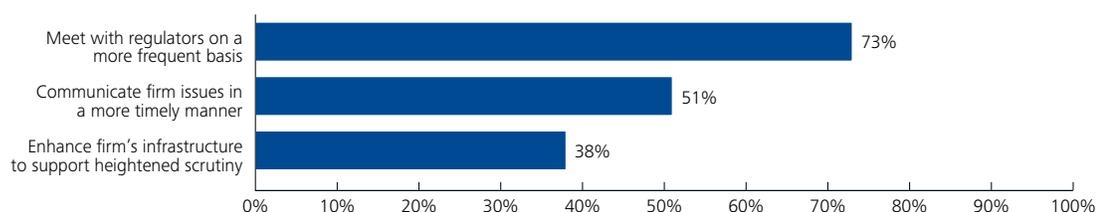
²⁸ “EU Financial Reform,” McDermott Will & Emery, September 23, 2010, http://www.mwe.com/index.cfm/fuseaction/publications.nldetailobject_id/c8b430c2-781e-4090-acda-e6302d58defa.cfm

²⁹ “Bank Regulatory Developments in Switzerland in the Aftermath of the Crisis,” Presentation by Dr. Daniel Daeniker, Homburger, October 27, 2010

³⁰ These percentages total to more than 100% because respondents could make multiple selections.

Figure 26

In light of the recent credit crisis, in which of the following ways have you changed the way you address/manage regulatory concerns?



Note: Percentages total to more than 100% because respondents could make multiple selections.

In response to the changed regulatory environment, roughly three-quarters of institutions said they now meet with regulators more regularly, while 51 percent said they make an effort to communicate to the regulators in a timelier manner the issues that affect their institution (see Figure 26). In addition, 38 percent of institutions have taken steps to enhance their infrastructure to support efforts to comply with the heightened regulatory scrutiny.

With much of the attention of regulators focused on systemically important financial institutions, large institutions were more likely to have made changes. Among institutions with \$100 billion or more in assets, 89 percent said they now meet more often with regulators, and 52 percent had upgraded their infrastructure to support regulatory compliance.

To manage their relationships with regulators, 35 percent of institutions have instituted a formal program and meet regularly with regulators, while 51 percent have an ad hoc program and meet with regulators only as needed. Among institutions with \$100 billion or more in assets, 55 percent said they had instituted a formal program as compared to 30 percent of institutions with less than \$10 billion in assets.

Regional perspective

There were significant differences across regions in terms of how institutions manage regulatory risk according to survey respondents. The Dodd-Frank Act constitutes a major reform and strengthening of the regulatory framework in the United States. In addition, oversight by U.S. regulators has become more stringent since the global financial crisis. As a result of these developments, institutions in the United States/Canada were more likely to report changes in response to the regulatory environment, with 90 percent saying that they were meeting with regulators more often, compared with 63 percent in Europe, 56 percent in Asia/Pacific, and 64 percent in Latin America. Fifty-nine percent of U.S./Canadian institutions said they had upgraded their compliance infrastructure, compared to 37 percent in Europe, 28 percent in Asia/Pacific, and none in Latin America.

Institutions in the United States/Canada were also more likely to have instituted formal programs to meet with regulators. Fifty-eight percent of institutions in the United States/Canada have a formal program and meet with regulators regularly, compared to 26 percent in Europe, 24 percent in Asia-Pacific, and 21 percent in Latin America.

Risk management systems and infrastructure

Risk management relies on robust information and technology systems. The ability to quickly integrate risk information in a consistent format across the organization will help institutions gain a comprehensive picture of their overall risk profile, as well as the risk associated with individual counterparties. The global financial crisis highlighted the importance, and the difficulties, of achieving an integrated and seamless approach to risk data. In their October 2009 report, the Senior Supervisors Group cited the complexity of the financial industry's technology infrastructure as a key hindrance in identifying and measuring risk within the financial system.³¹ In some institutions, the limitations of enterprise risk management technology systems have led individual lines of business to create their own systems, leading to a potentially fragmented structure.

Institutions increasingly need the ability to respond to mounting requests from regulators for stress tests, reporting, and ad hoc information. As regulatory requirements evolve, institutions are likely to need the flexibility to reconfigure and scale their risk systems. For example, some banks are facing challenges with credit valuation adjustment analytics and with generating liquidity stress testing reports from their legacy asset-liability management systems. For insurers, Solvency II may also place additional demands on risk management technology systems: There will be the need to calculate regulatory capital in a timely fashion and to conduct continuous modeling of solvency, which may prove difficult for those with legacy systems.

Structural changes to markets and new business models are presenting additional demands on risk management technology systems. For example, derivatives trading may increasingly move to exchanges and to central clearing facilities. As the industry's derivatives business model changes, corresponding changes to the operations and technology infrastructure may be required. As new entities enter into derivatives clearing activities, counterparty and operational risks may need to be assessed.

Since the global financial crisis, many major financial institutions have undertaken significant investments to upgrade their risk technology infrastructure—to help provide for the availability of more consistent and reliable risk information, to help enhance the capabilities of technology infrastructure to support new functional requirements needed by the business, and to support regulatory compliance, increased stress testing, and enhanced risk reporting capabilities.

Another trend among some institutions has been to adopt a shared risk technology model that provides the front office with the analytics necessary to allow it to serve as the “first line of defense” in risk management, while the risk management function defines the specific risk measures. Under this approach, common pricing models are often used for valuation and risk measurement.

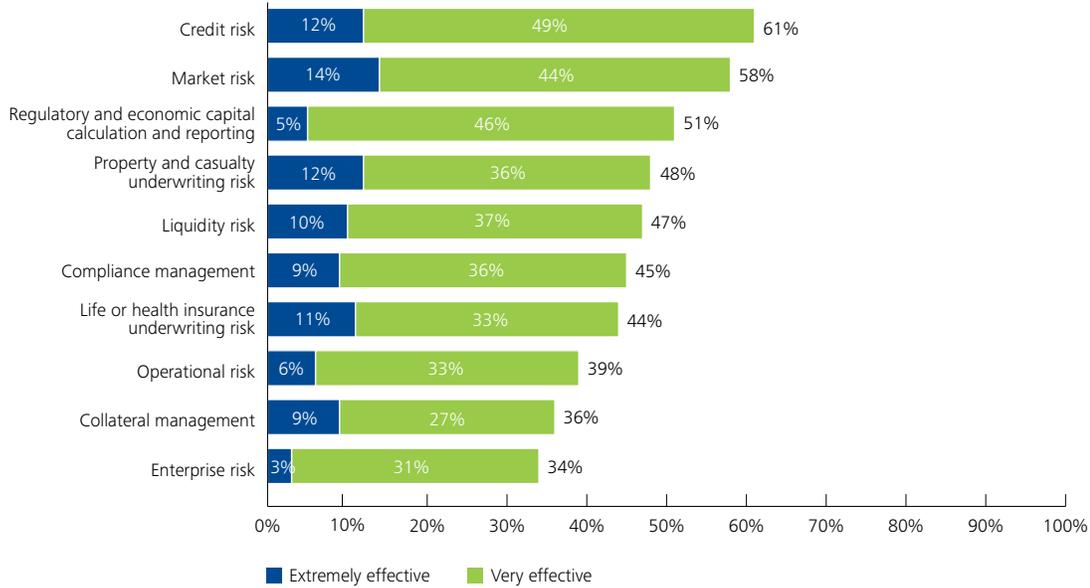
Other institutions have focused on the need for both the finance and risk management functions to have access to reliable and granular information, such as counterparty exposures and underlying transaction-level data, for analysis and reporting purposes. These institutions have undertaken a variety of efforts to meet shared finance and risk management needs, such as data quality remediation efforts, joint systems architecture renewal, data warehousing, and reporting engines.

Institutions may want to devote additional focus on risk technology systems, supported by the fact that executives in the survey gave their institutions somewhat higher ratings in managing major risks than they gave to the ability of their risk management technology systems to support management of these risks. Roughly three-quarters of executives rated their institution as extremely or very effective in managing credit, market, and liquidity risk (see “Management of key risks”). When asked to rate their risk management technology systems in these areas, however, a smaller proportion, 61 percent, rated them as extremely or very effective in supporting credit risk management, while 57 percent provided as high a rating for effectiveness in supporting market risk management and 47 percent for liquidity risk (see Figure 27).

³¹ “Risk Management Lessons from the Global Banking Crisis of 2008,” Senior Supervisors Group, October 21, 2009.

Figure 27

How effective do you think your risk management systems are in the following areas (whether developed by a vendor or internally)?

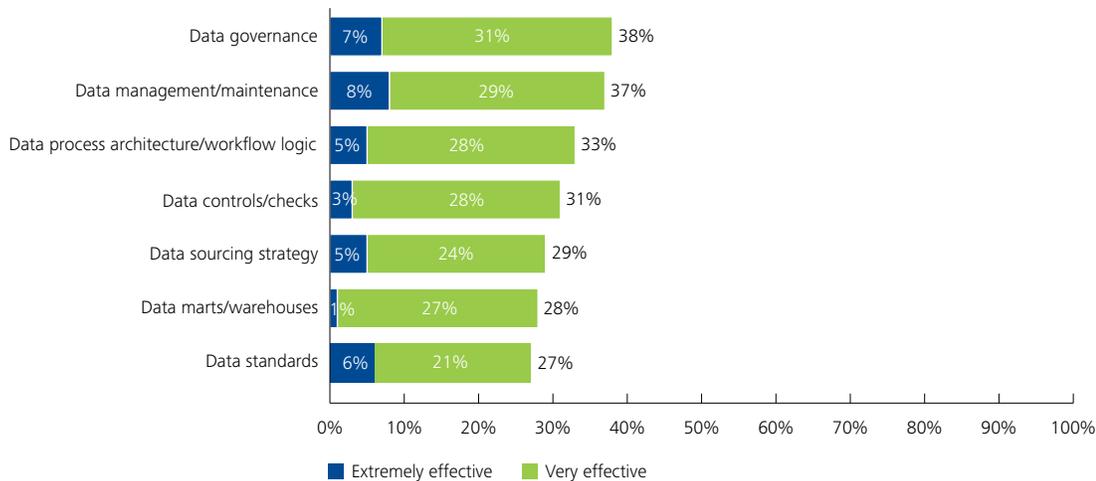


Functional limitations may exist in technology systems and if so, institutions may need to do more manual work in gathering, reconciling, cleaning, and analyzing risk data. Institutions may also find that they may want to improve their ability to easily leverage risk data consistently across functions and businesses.

Forty percent of executives surveyed rated their risk data strategy and infrastructure as being extremely or very effective in data management/maintenance and data controls/checks (see Figure 28). In the areas of data standards and data marts/warehouses, a smaller proportion, about one-quarter, of executives considered their institutions to be extremely or very effective.

Figure 28

How effective do you think your organization is in the following aspects of risk data strategy and infrastructure?



The data you need for risk management is not as well supported as it might be. When you try to use data collected for other business purposes to enable risk management, it's missing a lot of the elements you'd like or need—it's like when you need electricity, you can't just use the plumbing system!

— Managing director, risk management, asset management firm



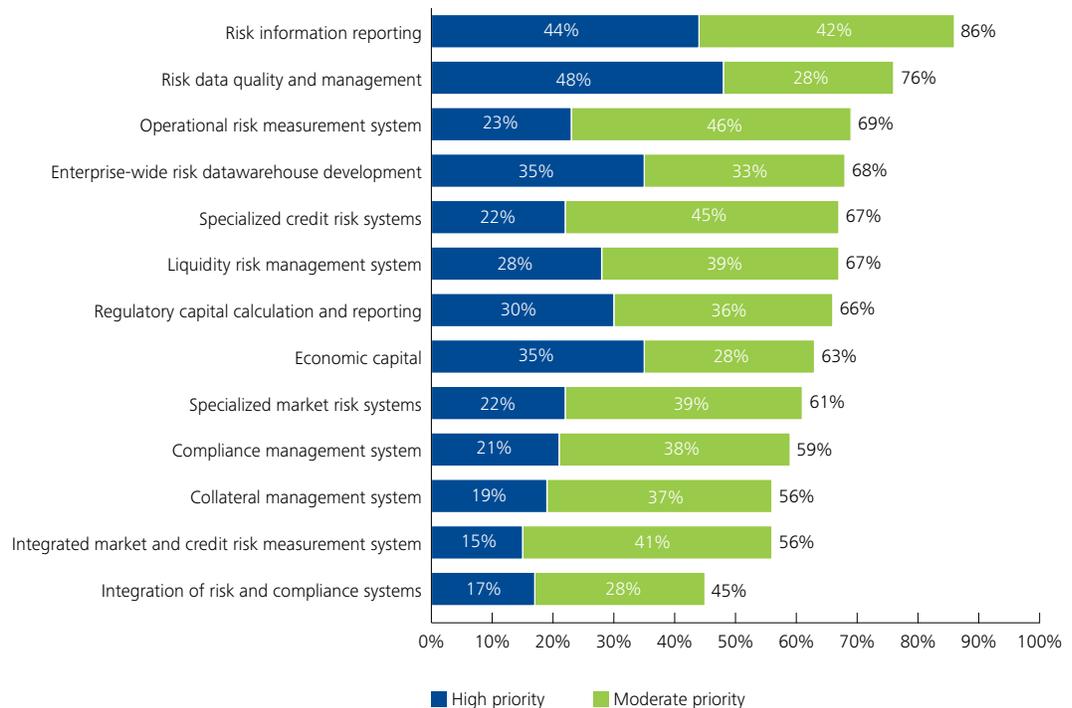
Executives had the greatest concerns about risk data quality and management, which 43 percent described as a major concern. The changing regulatory environment, including Basel II and III, Solvency II, and the Dodd-Frank Act, may also place additional demands for data and reporting on risk technology systems. The ability of risk technology systems to adapt to evolving regulatory requirements was a major concern for 38 percent of executives.

Roughly two-thirds of institutions reported they have strategies to address their risk infrastructure, but in most cases executives said that the strategies are not yet well developed. Roughly two-thirds of institutions have strategies for most areas, including risk software applications, data warehousing, architecture standards, and data sourcing, but less institutions had well developed strategies. For hardware, 26 percent of executives considered their strategy to be well developed,

although this was an increase from 16 percent in 2008. For architecture standards, 18 percent of respondents considered their strategy to be well developed, up from 10 percent in 2008.

Consistent with these findings, concerns about data quality challenges were also expressed by many institutions. The greatest risk technology priorities cited for the next 12 months were to improve risk data quality and management, which was a high priority for 48 percent of institutions, and to enhance the reporting of risk information, which was a high priority for 44 percent (see Figure 29). Based on the survey results, more institutions agree that building risk information systems with the ability to gather consistent data from across the organization and to quickly generate reports customized to specific requests, such as from senior management or regulators, should likely be a priority.³²

Figure 29
Over the next 12 months, how much of a priority are improvements to the following areas of your risk technology capabilities?



³² For additional discussion, see the report by the Deloitte Center for Banking Solutions, *Winning in the new risk environment*, 2010, Deloitte Development LLC.

Conclusion

The experiences of the global financial crisis have created a new financial services marketplace: Economies have been strained, key players have changed or disappeared, and business models and the avenues to competitive advantage have been altered. The scale and pace of regulatory change has also been unprecedented, with new requirements under Basel III as well as important changes in individual countries, such as the United States and United Kingdom.

Responding to these new realities may require effective risk governance. Boards of directors have an important role to play in providing active oversight of risk management, including the approval of their institution's risk management framework and risk appetite. The CRO position can provide an important focal point, helping risk management to receive adequate attention from senior management and to provide the board of directors with independent views on key risk management issues.

Institutions that do not have an ERM program may consider implementing one to gain a comprehensive view of risks across the organization and identify interdependencies. To achieve such a comprehensive picture of the risks they face, many institutions may need to consider upgrading their risk management information systems so they have consistent, quality risk data that can be easily aggregated across products, geographies, and counterparties.

There is increased attention to the importance of managing tail risk from events that are rare, but potentially catastrophic. Many institutions may benefit from reassessing their risk models and supplementing VaR with stress tests and other tools. Given the volatility of the financial markets, some institutions may also consider conducting stress tests more frequently than they do currently.

But risk management is not simply a matter of models and methodologies. Institutions may also need to consider how they can infuse risk management considerations throughout the organization, creating a culture that places a value on appropriate risk taking. Another area likely to receive heightened attention is how to incorporate risk management considerations into performance goals and incentive compensation decisions.

Finally, this report on Deloitte's *Global risk management survey, seventh edition*, underscores that the bar for risk management in financial services may continue to be raised: There are still many challenges ahead to navigating in a changed world.

Contacts

Global Financial Services Industry Leadership

Jack Ribeiro
Chairman
Global Financial Services Industry
Deloitte Touche Tohmatsu Limited
+1 212 436 2573
jribeiro@deloitte.com

Chris Harvey
Global Managing Director and
Banking and Securities Industry
Sector Leader
Global Financial Services Industry
Deloitte Touche Tohmatsu Limited
+44 20 7007 1829
caharvey@deloitte.co.uk

Joe Guastella
Insurance Industry Sector Leader
Global Financial Services Industry
Deloitte Touche Tohmatsu Limited
+1 212 618 4287
jguastella@deloitte.com

Stuart Opp
Investment Management Industry
Sector Leader
Global Financial Services Industry
Deloitte Touche Tohmatsu Limited
+44 20 7303 6397
stopp@deloitte.co.uk

Survey editor

Edward T. Hida II, CFA
Global Leader - Risk & Capital
Management
Global Financial Services Industry
Deloitte Touche Tohmatsu Limited
+1 212 436 4854
ehida@deloitte.com

Contributors

Argentina
Claudio E. Fiorillo
Partner
Deloitte & Co S.R.L.
+54 11 4320 2700, Ext. 4781
cfiorillo@deloitte.com

Belgium
Frank De Jonghe
Partner
Deloitte & Touche
+32 2 800 24 56
fdejonghe@deloitte.com

Canada
Leon Bloom
Partner
Deloitte & Touche
+1 416 601 6244
lebloom@deloitte.com

China
Dr. Philip Goeth
Managing Director GFSI, Asia
Pacific
Deloitte Touche Tohmatsu CPA Ltd.
+86 10 8520 7116
phgoeth@deloitte.com.cn

China, Hong Kong, S.A.R.
Eric Tong
Partner
Deloitte Touche Tohmatsu
+852 2852 6690
ertong@deloitte.com.hk

France
Marc Van Caeneghem
Partner
Deloitte Conseil
+33 1 55 61 65 88
mvancaeneghem@deloitte.fr

Italy
Paolo Gianturco
Partner
Deloitte Consulting S.p.A.
+39 02 83323131
pgianturco@deloitte.it

New Zealand
Richard Kirkland
Partner
Deloitte New Zealand
+64 4 470 3711
richardkirkland@deloitte.co.nz

United Kingdom
Julian Leake
Partner
Financial Services Industry
Deloitte MCS Limited
+44 20 7007 1223
jleake@deloitte.co.uk

United States
Dolores Atallo-Hazelgreen
Director
Deloitte & Touche LLP
+1 212 436 5346
datalloahazelgreen@deloitte.com

Samuel Auxier
Director
Deloitte & Touche LLP
+1 312 386 2793
sauxier@deloitte.com

Scott Baret
Partner
Deloitte & Touche LLP
+1 212 436 5456
sbaret@deloitte.com

Craig Brown
Director
Deloitte & Touche LLP
+1 212 436 3356
cbrown@deloitte.com

J.H. Caldwell
Partner
Deloitte & Touche LLP
+1 704 227 1444
jacaldwell@deloitte.com

Eric Clapprood
Senior Manager
Deloitte Consulting LLP
+1 860 725 3473
eclapprood@deloitte.com

Michele Crish
Senior Manager
Deloitte & Touche LLP
+1 212 436 2053
mcrish@deloitte.com

Karen DeToro
Senior Manager
Deloitte Consulting LLP
+1 312 486 5640
kdetoro@deloitte.com

Andrea Di Giovanni
Director
Deloitte & Touche LLP
+1 212 436 7094
andigiovanni@deloitte.com

Simon Fisher
Senior Manager
Deloitte & Touche LLP
+1 212 436 5907
sifisher@deloitte.com

Thomas Fineis
Director
Deloitte Consulting LLP
+1 312 486 5593
tfineis@deloitte.com

Olga Kasparova
Senior Manager
Deloitte & Touche LLP
+1 617 437 2812
okasparova@deloitte.com

Paul Kurgan
Director (Retired)
Deloitte & Touche LLP
+1 202 626 4420
pkurgan@deloitte.com

Patricia Matson
Principal
Deloitte Consulting LLP
+1 860 725 3302
pmatson@deloitte.com

Ricardo Martinez
Principal
Deloitte & Touche LLP
+1 212 436 2086
rimartinez@deloitte.com

Michael McLaughlin
Principal
Deloitte Consulting LLP
+1 312 486 4466
mikemclaughlin@deloitte.com

William Nugent
Senior Manager
Deloitte & Touche LLP
+1 212 436 3070
wnugent@deloitte.com

Kenneth Risko
Senior Manager
Deloitte & Touche LLP
+1 615 259 1832
krisko@deloitte.com

Thomas Rollauer
Director
Deloitte & Touche LLP
+1 212 436 4802
trollauer@deloitte.com

Sabeth Siddique
Director
Deloitte & Touche
+1 202 378 5289
ssiddique@deloitte.com

Richard Spillenkothen
Director
Deloitte & Touche LLP
+1 202 220-2747
rspillenkothen@deloitte.com

Jyoti Vazirani
Senior Manager
Deloitte & Touche LLP
+1 215 299 4574
jvazirani@deloitte.com

Acknowledgements

This report is a result of a team effort that included contributions by financial services practitioners from member firms of Deloitte Touche Tohmatsu Limited around the world. Special thanks are given to Bayer Consulting for administering the survey and their assistance with the final document, and Cara Buerger, Deloitte United States (Deloitte Services LP), for design support.

In addition, the following individuals conducted analysis and provided project management and editorial support:

Liza Benner
United States
Deloitte Services LP

Aditi Jain
United States
Deloitte & Touche LLP

David Merrill
United States
Deloitte Services LP

Vicky Polyakov
United States
Deloitte & Touche LLP

Jeanne-marie Smith
United States
Deloitte & Touche LLP

Devon Strobel
United States
Deloitte & Touche LLP

Deloitte Touche Tohmatsu Limited and DTTL Member Firms Risk & Capital Management Contacts

Argentina

Claudio E. Fiorillo
Partner
Deloitte & Co S.R.L.
+54 11 4320 2700, Ext. 4781
cfiorillo@deloitte.com

Australia

Sean Coady
Partner
Deloitte Touche Tohmatsu
+61 3 9671 6396
scoady@deloitte.com.au

John Kidd

Partner
Deloitte Touche Tohmatsu
+61 3 9671 7357
jkidd@deloitte.com.au

Mark Young

Partner
Deloitte Touche Tohmatsu
+61 2 9322 3533
mayoung@deloitte.com.au

Austria

Dominik Damm
Partner
Deloitte Financial Advisory GmbH
+43 1 537 00 5400
ddamm@deloitte.at

Belgium

Frank De Jonghe
Partner
Deloitte & Touche
+32 2 800 24 56
fdejonghe@deloitte.com

Brazil

Anselmo Bonservizzi
Partner
Deloitte Touche Tohmatsu
+55 11 5186 6226
absonservizzi@deloitte.com

Ives Pereira Müller

Partner
Deloitte Touche Tohmatsu
+55 19 3707 3009
imuller@deloitte.com

Rodrigo Mendes Duarte

Partner
Deloitte Touche Tohmatsu
+55 11 5186 6206
rodrigomendes@deloitte.com

Canada

Leon Bloom
Partner
Deloitte & Touche
+1 416 601 6244
lebloom@deloitte.com

Caribbean

Jeremy Smith
Partner
Deloitte & Touche
+1 345 8143315
jersmith@deloitte.com

Chile

Pablo Herrera
Partner
Deloitte Chile
+56 2 729 8150
paherrera@deloitte.com

China

Dr. Philip Goeth
Managing Director, GFSI, Asia Pacific
Deloitte Touche Tohmatsu CPA Ltd.
+86 10 8520 7116
phgoeth@deloitte.com.cn

Jason Li

Lead Partner
Deloitte Touche Tohmatsu CPA Ltd.,
China
+86 10 8520 7012
jasonlishigang@deloitte.com.cn

Alvin Ng

Partner
Deloitte Consulting (Shanghai)
Co., Ltd.
+86 10 8520 7333
alvng@deloitte.com.cn

China, Hong Kong S.A.R.

Maria Xuereb
Partner
Deloitte Touche Tohmatsu
+852 2852 1008
marxuereb@deloitte.com.hk

Denmark

Jens Peter Hoeck
Partner
Deloitte & Touche Denmark
+45 36 103426
jhoeck@deloitte.dk

France

Marc Van Caeneghem
Partner
Deloitte Conseil
+33 1 55 61 65 88
mvancaeneghem@deloitte.fr

Germany

Jörg Engels
Partner
Deloitte & Touche GmbH
Wirtschaftsprüfungsgesellschaft
+49 211 8772 2376
jengels@deloitte.de

Ireland

Martin Reilly
Partner
Deloitte & Touche
+35 31417 2212
mreilly@deloitte.ie

India

Abhay Gupte
Senior Director
Deloitte Touche Tohmatsu India
Pvt. Ltd
+91 22 6681 0600
agupte@deloitte.com

Indonesia

Claudia Lauw
Partner
Deloitte Touche Tohmatsu
+62 21 2312879, Ext. 6993
clauw@deloitte.com

Italy

Pierluigi Brienza
Managing Partner
Deloitte Consulting S.p.A
+39 06 47805412
pbrienza@deloitte.it

Paolo Gianturco

Partner
Deloitte Consulting S.p.A.
+39 02 83323131
pgianturco@deloitte.it

Japan

Shigeru Furusawa
Partner
Deloitte Touche Tohmatsu LLC
+813 6213 3160
shigeru.furusawa@tohmatsu.co.jp

Daisuke Kuwabara

Partner
Deloitte Touche Tohmatsu LLC
+81 3 6213 3525
Daisuke.kuwabara@tohmatsu.co.jp

Shigeru Omori

Partner
Deloitte Touche Tohmatsu LLC
+813 6213 3170
Shigeru.omori@tohmatsu.co.jp

Tsuyoshi Oyama

Partner
Deloitte Touche Tohmatsu LLC
+813 6213 1945
Tsuyoshi.oyama@tohmatsu.co.jp

Luxembourg

Laurent Berliner
Partner
Deloitte
+352 45145 2328
lberliner@deloitte.lu

Xavier Zaegel

Partner
Deloitte
+352 45145 2748
xzaegel@deloitte.lu

Malaysia

Steven Lim
Executive Director
Deloitte
+603 7723 6515
stevenlim@deloitte.com

Mexico

Miguel Hernandez
Director
Deloitte México
+52 55 50806295
mihernandez@deloittemx.com

The Netherlands

Hans Van Leeuwen
Partner
Deloitte
+31 882883293
HavanLeeuwen@deloitte.nl

New Zealand

Richard Kirkland
Partner
Deloitte
+64 4 470 3711
richardkirkland@deloitte.co.nz

Philippines

Diane Yap
Partner
Deloitte
+63 2 8120535, Ext. 9053
dyap@deloitte.com

Poland

Zbigniew Szczerbetka
Partner
Deloitte Central Europe
+48 22 511 0799
zszczerbetka@deloitte.com

Singapore

Tse Gan Thio
Executive Director
Deloitte & Touche Enterprise
Risk Services
+65 6216 3158
tgthio@deloitte.com

Spain

Rafael Campo Bernad
Partner
Deloitte S.L.
+4 915 145000 Ext.1488
rcampobernad@deloitte.es

South Africa

Wayne Savage
Partner
Deloitte & Touche
+27 11 209 8082
dsavage@deloitte.co.za

South Korea

Jung In Lee
Partner
Deloitte Consulting Yuhanhoesa
+82 2 6676 1312
junginlee@deloitte.com

Switzerland

Philipp Keller
Partner
Deloitte AG
+41 44 421 6290
phkeller@deloitte.ch

David Streliski

Partner
Deloitte SA
+41 22 747 19 00
dstreliski@deloitte.ch

Taiwan

Benson Cheng
Partner
Deloitte
+886 2 25459988, Ext.7843
bensohcheng@deloitte.com.tw

Thailand

Suttharug Panya
Partner
Deloitte Touche Tohmatsu Jaiyos
Advisory Co., Ltd.
+66 26765700, Ext. 5247
spanya@deloitte.com

United Kingdom

William Higgins
Lead Partner – Risk and Regulation
Deloitte LLP
+44 207 303 2936
whiggins@deloitte.co.uk

Vishal Vedi

Partner
Deloitte LLP
+44 207 303 6737
vediv@deloitte.co.uk

United States

Edward T. Hida II, CFA
Global Leader - Risk &
Capital Management
Global Financial Services Industry
Deloitte Touche Tohmatsu Limited
+1 212 436 4854
ehida@deloitte.com

Robert Maxant

Partner
Deloitte & Touche LLP
+1 212 436 7046
rmaxant@deloitte.com

Alok Sinha

Principal
Deloitte & Touche LLP
+1 415 783 5203
asinha@deloitte.com

Deloitte refers to one or more of Deloitte Touche Tohmatsu Limited, a UK private company limited by guarantee, and its network of member firms, each of which is a legally separate and independent entity. Please see www.deloitte.com/about for a detailed description of the legal structure of Deloitte Touche Tohmatsu Limited and its member firms.

Deloitte provides audit, tax, consulting, and financial advisory services to public and private clients spanning multiple industries. With a globally connected network of member firms in more than 150 countries, Deloitte brings world-class capabilities and deep local expertise to help clients succeed wherever they operate. Deloitte's approximately 170,000 professionals are committed to becoming the standard of excellence.

This publication contains general information only, and none of Deloitte Touche Tohmatsu Limited, its member firms, or their related entities (collectively, the "Deloitte Network") is, by means of this publication, rendering professional advice or services. Before making any decision or taking any action that may affect your finances or your business, you should consult a qualified professional adviser. No entity in the Deloitte Network shall be responsible for any loss whatsoever sustained by any person who relies on this publication.