



**IAFE**

**INTERNATIONAL ASSOCIATION OF FINANCIAL ENGINEERS**

**Report of the Operational Risk Committee:**

**Evaluating Operational Risk Controls**

**CONCLUSIONS AND FINDINGS ON THE TOPIC OF:**

*“How should firms determine the effectiveness of their operational risk controls?”*

**November 2001**

**[www.iafe.org](http://www.iafe.org)**

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## Summary

During the year 2000/2001, the Operational Risk Committee of the International Association of Financial Engineers (“IAFE”) explored the question of “*How should firms determine the effectiveness of their operational risk controls?*” The key findings of the Operational Risk Committee on this topic are as follows:

1. **Definitions.** Firms should use a broader definition of operational risk for purposes of managing operational risk and a narrower definition for measuring operational risk.
2. **Balanced Approach.** Operational risk controls must take into account both quantitative and qualitative information.
3. **Culture.** Culture occupies a pivotal role in effective operational risk management.
4. **Firm-wide consistency.** Operational risk management is a company-wide pursuit that requires a commitment to maintain consistent values and policies regarding operational risk.
5. **Audits.** An important tool for testing operational risk controls is the audit process.
6. **Risk Review Committees.** Risk review committees can be an important tool to evaluate operational risk controls.
7. **Loss Data Bases.** Loss data bases can provide a broad view of operational risk.
8. **Indicators.** Indicators are important tools to assess operational risk controls.

## **Introduction and Overview**

Operational risk is now the focus of intense interest among industry participants, regulators and other observers. Concern has been prompted by a steady stream of significant operational risk losses at major international banks.

Of all the different forms of risk which can affect firms, operational risk can be among the most devastating and the most difficult to anticipate. However, industry participants have differed widely over many aspects of operational risk, including definitions, measurement methods, capital requirements, modeling tools and the appropriate balance of qualitative and quantitative approaches.

Amid this ongoing discussion and debate, the IAFE formed the Operational risk Committee in the summer of 2000. Its mission is to promote informed discussion among full range of participants and observers involved in the global operational risk dialogue.

To further promote this dialogue, the Operational Risk Committee selected a practical and broadly applicable topic for examination during the year 2000/2001: *“How should firms determine the effectiveness of their operational risk controls?”* Most firms have some form of established controls and procedures to monitor and mitigate operational risk. Accordingly, a logical next step in managing operational risk is the determination of how well these controls and procedures are in fact working relative to their intended outcomes. This topic will be meaningful to firms regardless of their individual approaches to operational risk or the ultimate form of any regulatory activity.

The Committee explored this question in several ways. A panel discussion was held at the Ninth Annual Membership Meeting and Conference of the IAFE on October 12, 2000 in New York. A roundtable discussion for the operational risk community was held in New York on March 12, 2001. An additional panel discussion was held July 3, 2001 at the Financial Engineering Symposium 2001 in Sophia Antipolis, France, which was jointly sponsored by the IAFE and the CERAM Sophia Antipolis Graduate School of Management and Technology. The results of these efforts are reported here.

## **Key Findings**

In discussing the issue of how can firms determine the effectiveness of their operational risk controls, the Operational Risk Committee identified eight key findings.

*1. **Definitions.** Firms should use a broader definition of operational risk for purposes of managing operational risk and a narrower definition for measuring operational risk.*

A useful starting point for defining operational risk is the concept of “losses caused by problems with people, processes, technology, or external events.” Within these broad constraints, there is nonetheless ambiguity. There is room for debate about whether non-monetary losses should be taken into consideration by risk managers. While non-financial losses such as reputational damage can negatively impact a firm, they are difficult to quantify or cannot be quantified at all. For purpose of determining the amount of regulatory capital that banks (and eventually other types of firms) are subject to, banks should use a narrow definition of operational risk that includes only quantifiable losses. A broader definition provides a more solid framework for management decisions and monitoring controls by taking into account the possibility that serious reputational damage could have a financial impact on a company. There are inherent limitations to the ability of firms to precisely measure operational risk. The focus, instead, should be on identifying the overall orders of magnitude among potential operational risks. Operational risk is a much broader category than merely “operations risk,” and it is not limited to the back office. Instead, it encompasses all parts of a business operation, from front to middle to back. It often resides deep within the processes of an organization and therefore can be difficult to identify.

*2. **Balanced Approach.** Operational risk controls must take into account both quantitative and qualitative information.*

A broad approach to operational risk is essential to evaluating the effectiveness of operational risk controls. A key issue is not, “Should risk managers focus more on quantitative or qualitative information? but, “How can they combine these two aspects to best understand operational risk and assess controls?” Risk managers should seek the best combination of both approaches. Quantitative and qualitative information go hand-in-hand and must be taken into consideration together, as the process of discovering and analyzing risk is vital if a firm is to change its behavior over time.

## **Key Findings, Contd.**

*3. **Culture.** Culture occupies a pivotal role in effective operational risk management.*

The importance of culture must not be underestimated or taken for granted, even though many aspects of a firm's culture can be difficult to quantify, measure or model. Corporate culture is a pivotal factor in how risk is controlled and, therefore, must be taken into account when measuring the effectiveness of operational risk controls

Two possible models for describing a firm's operational risk culture can be described as the "Control Culture" and the "Risk Tolerance Culture," each at opposite ends of the spectrum. These descriptions are of necessity generalizations and most firms do not fit squarely into one category of operational risk culture or the other, but instead have components of both. The Control Culture strives to minimize operational risk by maintaining an attitude of low tolerance of operational risk. Firms that adopt this approach generally view operational risk loss as negative. To avoid incidents, these firms emphasize checks and balances and rigorous identification of risk. When an operational risk loss does occur, the firm will take immediate action to eliminate the underlying cause. Risk is seen as a series of issues or incidents that are addressed on an individual basis. This attitude tends to be found in firms that are considered conservative or risk-averse.

By contrast, the "Risk Tolerance Culture" views operational risk as an inherent aspect of running a profitable business. Thus, there is a tolerance zone that allows risk-taking within limits determined by the firm. In these environments, open communication is considered an essential part of controlling risk. Management encourages employees to report red flags or concerns, rather than restricting the flow of crucial information or creating an environment where employees are reluctant to report problems. In a Risk Tolerance Culture, problems and losses are viewed as elements of a company's overall risk profile. As in the case of the Control Culture, the Risk Tolerance Culture requires the presence of a well developed risk management infrastructure to monitor the effectiveness. The Risk Tolerance Culture is often found in firms that are described as entrepreneurial and risk-taking.

### **Key Findings, Contd.**

**4. *Firm-wide consistency.*** *Operational risk management is a company-wide pursuit that requires a commitment to maintain consistent values and policies regarding operational risk.*

Firms need to look across the entire organization when managing operational risk. They must reduce the common tendency to view operational risk as solely a divisional or business specific issue. It is often helpful to designate a person at a senior level to drive the firm wide management of operational risk. Regardless of a firm's attitude toward risk, managers will need tools to help them determine the effectiveness of operational risk controls. The application of and extent of a firm's controls may vary depending on the firm's culture and attitude towards risk tolerance. Line managers and senior managers, however, need to be consistent about applying policies and processes. This is an important component of risk management, both to address pressing issues and to shape the firm's strategic direction over time. Firms also need to provide managers with the appropriate incentives to continuously lessen their exposure to unwanted operational risk and to continue to expand their commitment toward operational risk management.

## **Findings, Contd.**

*5. Audits. An important tool for testing operational risk indicators is the audit process.*

The role of audits is certainly a complex subject, but irrespective of the primary purpose and role of audits, they can also play a role in determining the effectiveness of a firm's operational risk controls. The effectiveness of an audit, whether internal or external, depends upon the auditor's thorough understanding of the activities of the businesses being examined. If auditors are to effectively assess a company's control systems, they need to understand the inherent risks and complexities of the businesses they examine. To this extent, audits can be helpful in the operational risk process if they pinpoint issues that may result in losses and provide a starting point for managers to take preventative action against such problems. In practice, losses will occur despite the presence and efforts of internal and external auditors. This can be attributed to a number of factors. Managers may have little incentive to correct issues, especially if they have not yet caused losses. Decision-makers may not fully understand the importance of rigorous operational risk management practices. Issues may be perceived as not significant enough to affect the accuracy of the financial statements in a material way.

Moreover, audits may not take fully into account intangible factors such as corporate culture. Auditors, because of the independence of their role, do not directly have control over the activities of managers and their employees. They can identify risks and recommend ways to mitigate them, but they do not actually put controls in place. Audits provide a picture at a given point in time. There can be lags between the last audit and presence of new difficulties. Controls may be implemented, but are ineffective if they are allowed to slip between reviews. The findings of audits may also not be integrated into the overall risk management process.

There are a number of ways to increase the effectiveness of audits. Audits should focus on a firm's core risks. Audits should, wherever possible, be performed by professionals with a thorough understanding of the complexity of the business unit in question. External audits can provide essential checks and balances by testing and examining the findings of management. Once audits have been performed, the results should be tied to some type of consequence, in order to provide an incentive for improvement.

## **Key Findings, Contd.**

*6. Risk Review Committees. Risk review committees can be an important tool to evaluate operational risk controls.*



A number of organizations use risk review committees to assess current controls before any new business line is initiated. The committee outlines the necessary control changes that must be implemented in order to support the business line. Both line managers and senior management must agree on the efficacy of the controls before implementation by the business line. These committees can greatly enhance overall communication on operational risk issues and can also raise awareness about potential problems.

### **Key Findings, Contd.**

*7. Loss Data Bases. Loss data bases can provide a broad view of operational risk.*

Loss data bases, both internal and external, are important aspects of an operational risk program. An understanding of interconnectivity of different risks is a prerequisite to controlling problems and assessing practices. Firms should strive to understand the causes and related factors relevant to operational risk losses. Comprehensive qualitative information can help managers identify the commonalities among loss events. Seeing these patterns or common threads may allow managers to recognize red flags in their own controls before incidents occur. Quantitative tools further enhance a database by allowing it to be used for benchmarking.

Membership in a data-sharing consortium can provide firms with a venue for studying external losses and assessing controls. Such groups allow members to look at incidents that have happened outside their own operations. As with external loss databases, the information shared in a consortium can be used for benchmarking purposes and comparing the firm's control policies with those of other firms. (There are, however, difficulties in comparing the data of one firm with those of another, given the many unique factors that comprise a company's overall risk profile).

## **Findings, Contd.**

### **8. Indicators.** *Indicators are important tools to assess operational risk controls.*

There are numerous indicators that firms can monitor to assess their operational risk controls. An important goal of indicators is to spot problems in their earliest stages so that preventive action can be undertaken. Indicators, therefore, should focus on key risks. Indicators can provide a common way of determining whether a company is successfully monitoring controls and carefully scrutinizing the business lines. Indicators can provide a common dashboard to evaluate operational risks. However, the composition of existing and historical losses will not necessarily provide a guide to future losses.

There are many possible indicators. Some are general while others are specific to a particular business. In designing and using specific indicators, a number of issues should be considered. For example, earnings in either the top tier or the bottom tier of a firm may offer insight into either excessive or inadequate risk taking. Revenue growth itself is not necessarily an indicator of good risk management. Rapid growth should indicate that a firm is doing well, but the appearance of success can hide underlying problems. Increasing revenue may indicate high risk-taking, or provide business lines with greater influence to resist changes (since firms may be reluctant to restrict a profitable business). Stable earnings may suggest effective risk management, yet it is also possible that stable earnings can mask inadequate attention to risk. The appearance of stability could lull managers into a false sense of security, and lead them to overlook potential problems in their controls. Small profit margins are suspect, as business lines with very low earnings may be under-invested. Senior management and risk managers need to carefully scrutinize business lines with earnings in either the top tier or the bottom tier of a firm, paying special attention to excessive or inadequate risk-taking. The loss/expense ratio of a business line or a company may provide insight into the effectiveness of operational risk controls.

## **Conclusion**

Operational risk has been described as the oldest of risks, yet operational risk management is one of the newest of disciplines. There is significant work to be done, both on practical tools and theoretical concepts. A useful place for firms to begin their work is to examine the effectiveness of their existing operational risk controls. Virtually all firms do have these controls in some form, yet more attention needs to be focused on how effectively these controls are performing and how well they are promoting their firm's overall risk management initiatives and business strategy. The key tools in managing operational risk are the quality of a firm's management and the quality of a firm's controls. In the presence of large losses and growing concern about the size and magnitude of potential exposure of firms to operational risk, these issues are now more important than ever before.

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18. Managing Operational Risk in Financial Markets. Amanat Hussain. Butterworth-Heinemann, 2000.
19. Operational Risk: Measurement and Modeling. Jack Leon King. John Wiley & Sons, 2001.

### **Industry Periodicals**

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2. Operational Risk. [www.watersinfo.com](http://www.watersinfo.com). Operational Risk is a monthly newsletter with more of a micro focus on operational industry personnel and issues than Risk magazine.
3. Wall Street and Technology. [www.wstonline.com](http://www.wstonline.com). Wall Street Technology is one of the best sources for information on technology, software, and vendor trends in the financial services industry.
4. Treasury and Risk Management. [www.treasuryandrisk.com](http://www.treasuryandrisk.com). Almost every issue includes a major discussion of an operational risk.
5. Middle Office: A journal of firm-wide risk management. [www.fow.com/magazine/magazine.htm](http://www.fow.com/magazine/magazine.htm).
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7. Derivatives Strategy. [www.derivativesstrategy.com](http://www.derivativesstrategy.com).
8. Institutional Investor. [www.iimagazine.com](http://www.iimagazine.com). A good basic business journal with occasion discussions of risk related topics.
9. US Banker. [www.usbanker.faulknergray.com/](http://www.usbanker.faulknergray.com/)
10. The Industry Standard. [www.thestandard.com](http://www.thestandard.com). Full-text print and online journal with essential coverage e-commerce, the internet, and the new "net economy."
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### Key Web Sites

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4. The Group of Thirty. [www.group30.org](http://www.group30.org). The Group of Thirty's site includes a catalog of the organization's primary publications and documents.
5. Risk News. [www.risknews.net](http://www.risknews.net). This is a new offering from Risk Magazine, and includes real-time risk related headlines and events. A good source for daily monitoring of the risk industry.
6. Financial Technology Network. [www.financetech.com](http://www.financetech.com). Includes links to Wall Street & Technology, Insurance & Technology, Bank Systems & Technology, and Trade Shows and Conferences.
7. CIBC Financial Products. [www.schooolfp.cibc.com](http://www.schooolfp.cibc.com). CIBC Financial Products has constructed an in-depth educational web site devoted to all aspects of risk. This is one of the richest content sites on the web in terms of content.
8. FinanceWise. [www.financewise.com](http://www.financewise.com). Financewise is a search engine owned by Risk publications that focuses exclusively on financial content and risk management providers. This is one method of streamlining an internet search and retrieving more focused results.
9. Bank for International Settlement (BIS). [www.bis.org](http://www.bis.org). This site provides access to most BIS studies, documents, news releases, initiatives, documentation, and best practices guidelines.
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17. Barra. [www.barra.com](http://www.barra.com). Barra specializes in analytic models, software, consulting, and money management services. This site provides in-depth discussions of BARRA's predicted betas and information relating to BARRA models and indices.
18. Risk metrics. [www.riskmetrics.com](http://www.riskmetrics.com). Former JP Morgan-affiliated group devoted to providing risk management research, data, software, and consultation services, and benchmark risk management

products. RMG also provides free data on its Global Volatility Index (RMVI) and the Global Correlation Index (RMCI).

19. Value at Risk Resources. [www.gloriamundi.org](http://www.gloriamundi.org). A metasite for information on (VaR). This site provides an excellent bibliography of VaR books, articles, and research, and includes links to VaR software vendors, risk-related regulations, conferences and courses.
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22. Institute of Internal Auditors. [www.theiia.org](http://www.theiia.org).
23. Risk and Insurance Society. [www.rims.org](http://www.rims.org).
24. RiskCare. [www.riskcare.com](http://www.riskcare.com). This site includes daily risk management news, and short movies on a variety of topics, including footage of Nick Leeson being led away to prison.
25. The Board of Governors of the Federal Reserve System. [www.bog.frb.fed.us](http://www.bog.frb.fed.us). The fed site includes complete text of many of its reports and working papers, recent studies, statistics, and links to the regional member banks.
26. The Bank of England. [www.bankofengland.co.uk](http://www.bankofengland.co.uk). This site includes full-text documents, recent speeches, minutes from Monetary Policy Committee Meetings, results of the Treasury Bill auctions, inflation reports, press releases, monetary and banking statistics, working papers, and regulatory documents.
27. The Financial Services Authority. [www.fsa.gov.uk](http://www.fsa.gov.uk). The UK's FSA provides the full-text of reports, and press releases covering a variety of topics.
28. The Bundesbank. [www.bundesbank.de/index\\_e.html](http://www.bundesbank.de/index_e.html). Includes monthly economic reports, statistics, special topics, and regulatory-position statements.
29. Zurich IC<sup>2</sup>. [www.ic2.zurich.com](http://www.ic2.zurich.com). The IC<sup>2</sup> group has purchased the old CORE database from Operationalrisk.com and has renamed its offering FIRST(Financial Institution Risk Scenario Trends.) The group's web site provides an introduction to its unusual and innovative approach to managing risk.
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8. "Market Volatility Drives Escalating Operational Risk." Global Investor, December 1999/Jan. 2000. A rare but very important discussion on how volatility in the financial markets increase operational risk – particularly in back office operations.
9. "Operational Lapses Cost the Industry \$7 Billion." American Banker, November 18, 1999, Rob Garver. Discussion of a PriceWaterhouseCoopers report on operational risk. According to the survey financial institutions lost \$7 billion dollars in 1998 due to failed internal controls and other operational risks.
10. "Comment: Risk Strategy Should Involve Entire Company." American Banker, November 3, 1999, William M. Saubert. Discussion of A.T. Kearney survey on risk spending.
11. "Countering the Domino Effect." US Banker, August 1999, Orla O'Sullivan. Deborah Williams, a Meridien Research director referred by some as a "guru" in the risk management industry, discusses with the author enterprise-wise software packages, and the limitations of currently available tools. According to Williams, all the spectacular incidents in recent years – including Barings, Kidder Peabody, Sumitomo, Daiwa –have been operational risk failures.
12. "Fund Managers Fail Operational Risk and Efficiency Audit." Global Investor, February 1999, Sudip Roy. Addresses the importance of adopting straight-through processing as a tool for mitigating risk.
13. "Finding value in a collection of losses." Operational Risk Manager - LLP Publishing, Matt Kimber, June, 2000. An easy-to-read and fun approach to designing and using a loss database.
14. "Debunking Op Risk Myths." Operational Risk Newsletter from Risk Publications, Douglas Hoffman, March 2000.
15. "How to avoid signal failure." Risk. Doug Hoffman & Denis Taylor, November 1999.
16. "Getting the Measure of Operational Risk." Risk. Rob Jameson, November 1998.
17. "The Benefits of Sharing." Dan Mudge, Risk, January 2000.
18. "Made-to-Measure: Operational Risk Capital. Robert Ceske, Angelina Colombo, Lara Swann. Operational Risk Management. Autumn 2000.
19. "Share and Share Alike." Robert Ceske, Lara Swan. Risk Professional. November 1999.
20. "Quantifying Event Risk: The Next Convergence." Robert Ceske, Jose Hernandez. Journal of Risk Finance. Spring 2000.
21. "Controlling the Documentation Vortex." Charles Fishkin. MiddleOffice. Spring 2000.
22. "Electronic Derivatives Markets and Operational Risk Analysis." Charles Fishkin Operational Risk. May 2000.
23. "Hidden Dangers: Identifying Operational Risk in Collateral Management." Charles Fishkin. MiddleOffice. Summer 2000.
24. "Indicators of Operational Risk." Charles Fishkin. Derivatives Week. September 18, 2000.

25. Software Roundup: Op Risk Software – the Leading Contenders.” Rob Jameson and John Walsh, Operational Risk, June 2000. Includes operational risk managers’ software wishlist, and overview of available vendors. Comments on ORI: “ORI’s offerings build a flexible platform for the management and analysis of a wide range of op risk information.”

#### **Articles: Corporate & Other Applications**

1. “E-merging Risks.” Risk Management, July 2000. Emily Q. Freeman. A discussion of operational issues and solutions in cyberspace.
2. “Top Priority on Bottom Line.” Business Insurance, March 20, 2000. Sally Roberts. Discusses the transfer of business risk from the balance sheet of corporations to the insurance market. Includes discussion of how United Grain Growers identified and transferred exposure to a series of identified risks.
3. “Risk Management.” Computerworld, January 17, 2000. Mark Hall. Overview of operational risk management issues in the technology sector, with specific emphasis on ecommerce.
4. “The Final Frontier of Risk.” Reactions, May 1999, Russ Banham. Discussion of new operational risk policies being written for nonfinancial corporations, including Mead Corp, and United Grain Growers.
5. “Operational Risks, Bidding Strategies, and Information Policies in Restructured Power Markets.” Decision Support Systems, Jan. 1999, Ray Dennis. Overview of the development of advanced analytical tools for the measurement of operational risk in power systems.
6. “Avoiding the Pitfalls of Risk.” Infoworld, Ed Blount, April 1999.

#### ***Key Operational Risk Regulatory Documents***

##### *From the Bank For International Settlements, Basle Committee on Banking Supervision*

1. The New Basel Capital Accord. January 2001. Includes additional supplements on Credit Risk, Internal Ratings-Based Approach, Asset Securitization, Interest Rate Risk and Operational Risk. The general tenor of the document involves a shift from crude measures instituted under the 1988 Accord to more finely-tuned ones that do a better job capturing the risk sensitivity of an individual institution. This involves a shift away from the one size fits all, single risk measure, broad-brush approach to one that emphasizes banks’ own internal methodologies, supervisory review processes, and discipline. The scope of the document is broad and aims to cover a variety of solutions for banks that fall at various points on the risk management spectrum. The overall goal of the Basel Committee is to provide banks with incentives (in the form of capital discounts) for instituting proper risk

management controls. The Committee's recommendations remain essentially unchanged for market risk measures, but offer revolutionary changes for credit risk, and propose an operational risk capital charge (20% of the total capital charge) for the first time.

2. The New Basle Accord. Operational Risk Supplement. January 2001. What is most notable about the supporting document on Operational Risk is the Basel Committee's request for industry commentary on a number of topics, including data collection, risk indicators, indirect losses, insurance solutions. The Committee's primary goal is to "enhance operational risk assessment efforts by encouraging the industry to develop methodologies and collect data related to managing operational risk." Previously, the Basel Committee referred to operational risk as simply "all other risks." The 2001 recommendations represent the first time the regulatory body has addressed operational risk directly. This is near monumental in the development of the discipline. Under the old 1988 Accord, the Basel Committee made an implicit assumption that "all other risks" were included under the capital buffer that was related to Credit Risk. In the new recommendations, the Committee acknowledges that the 1988 Accord made rather crude calculations covering market and credit risks, and that the newer Accord recommends capital calculations based on more accurate assumptions. The new more finely tuned recommendations reduce the amount of capital that is put aside for "other risks" under the more broad-brushed approach. Hence, the Basel Committee is recommending capital requirements that cover operational risk directly, based on a three-pronged "evolutionary approach" based on the readiness and sophistication of member banks. Banks are essentially provided with capital discounts under this approach if they can demonstrate a well-managed and properly controlled operating environment. The essence of the Basel Committee's approach is based on a supposition that the capital charge for a typical bank will be less at each progressive step on the evolutionary spectrum.
3. The Relationship between banking supervisors and banks' external auditors. February 2001. [www.bis.org/publ/bcbs78.htm](http://www.bis.org/publ/bcbs78.htm). Recommends increased communication between bank supervisors and external auditors, and provides guidance on the relationship between the two parties.
4. Other Risks (OR) Discussion Paper. Revised April 2000. Available online at the following site: [www.sib.co.uk/basel/publications/bis\\_other\\_risks042000.pdf](http://www.sib.co.uk/basel/publications/bis_other_risks042000.pdf). This consultative document from the Basle Committee provides a revision of the regulatory committee's 1998 capital adequacy guidelines. The focus of the document is to propose a capital adequacy framework for *other risks*. The Basle Committee's Risk Management Group targets identified risks other than market and credit risk as the focus of this discussion paper, including client relationship exposure, valuation risk, legal and documentation risk, technology and processing risk, transactional exposure, safe custody risk, in-house fraud, external fraud, liquidity, business, reputational, and strategic risks. The committee stresses the importance for establishing proper capital adequacy guidelines in light of two developments: 1. Newly developed and finely tuned credit calculations mean that the previous assumption that the capital buffer for credit risk implicitly covered operational risk is no longer true, and 2. Developing banking practices such as securitization, outsourcing, specialized processing operations, and developing technologies will contribute to an environment of increased operational risk. The committee also recommends an internal capital assessment approach that decomposes activities into business lines and risk categories, and aggregates the total into an overall capital charge.
5. Operational Risk Management. September 1998. Available online at the following site: [www.bis.org/publ/index.htm](http://www.bis.org/publ/index.htm). This document is the committee's first attempt to address operational risk directly and systematically. The document isolates internal controls and corporate governance as the "most important types of operational risk" and concludes that such breakdowns can lead to financial losses through human error, fraud, or unsupervised and uncontrolled business practices. Other risks identified by the committee include technology failures and major disasters. The document is based on interviews with thirty major banks, and highlights the following concerns: 1. Incentives for business line managers to adhere to operational risk best practices are needed. The identified incentives include capital allocation for operational risk activities, performance based on operational risk measures, and the requirement that all business lines present operational risk data to

top levels of management. 2. Banks need to develop frameworks for managing operational risk – at best, most are only in the early stage of doing so. 3. Banks have immediate data collection needs. This data is needed in order to create operational risk models of the order that already exist for model and credit risk projections. There is currently very little historical and time-series data available for such projections. The required data includes internal audit ratings or internal self-assessments, operational indicators such as volume, turnover or rate of errors, losses, and income volatility.

6. Framework for Internal Control Systems in Banking Organizations. September 1998. Available online at the following site: [www.bis.org/publ/index.htm](http://www.bis.org/publ/index.htm). This document provides a discussion of the Basle Committee's thirteen principles for establishing internal controls. The report attempts to identify the types of control breakdowns that can occur. Control failures that are discussed include the following: 1. Lack of adequate management oversight and accountability and failure to develop a strong control culture. 2. Inadequate recognition and assessment of the risk of certain banking activities. 3. The absence or failure of key control structures and activities, such as segregation of duties, approvals, verifications, and account reconciliation. 4. Inadequate communication of information between different levels of management. 5. Inadequate or ineffective audit programs and monitoring activities. The document also stresses the role of internal auditors within a banking organization.
7. Core Principles For Effective Banking Supervision. September 1997. Available online at the following site: [www.bis.org/publ/index.htm](http://www.bis.org/publ/index.htm). This document includes a discussion of the Basle Committee's twenty-five core principles. The discussions attached to principles 14 (internal controls), 15 ("know-your-customer" and due diligence rules) directly deal with operational issues, although other sections of the document are of additional interest.
8. New Capital Adequacy Framework. June 1999. Available online at the following site: [www.bis.org/publ/index.htm](http://www.bis.org/publ/index.htm). This robust document includes an introduction to the Basle Committee's new capital adequacy framework that replaces the 1988 Accord, and proposed approaches to establishing such guidelines. The committee acknowledges that most banks use modified versions of the 1988 Accord, but it also recognizes the validity of newer methods, including internal credit ratings and portfolio models. It extends the pool of risks that the earlier Accord identified to include operational and "other" risks categories. The committee states in the document that hard-to-quantify risks, such as reputational and legal risks, are important to understand and measure, and recommends a capital charge for this category of risks. It suggests that a "simple benchmark" can be established from a category of indicators, including off-balance-sheet exposures and operating costs.
9. Consultative Paper on Customer Due Diligence. January 2001. [www.bis.org/publ/bcbs77.htm](http://www.bis.org/publ/bcbs77.htm). This paper presents a "qualitative top-down" approach to operational risk and the establishment of best practices within a banking environment. Key discussions include know-your-client (KYC) initiatives and the establishment of anti-money laundering programs. The paper states that without proper due diligence procedures in place, a bank becomes vulnerable to reputational, operational, legal, and concentration risks.

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*From ISDA*

10. Operational Risk Regulatory Approach. Discussion Paper. October 2000. This paper's primary objective is to "Identify qualitative criteria that support the appraisal of operational risk management by institutions." The paper makes a case for establishing good operational risk principles and a management framework. It also discusses the challenges for regulators in their efforts to implement a qualitative approach.

*From the Federal Reserve Bank of New York*

11. Building a Coherent Risk Measurement and Capital Optimization Model for Financial Firms. Tim Shephard-Walwyn and Robert Litterman. February 1998. Available online at the following site: [www.ny.frb.org](http://www.ny.frb.org). Includes a discussion of how financial firms are using internal models to measure and

allocate capital against credit, market, and enterprise-wide risks. The document provides an interesting definition of operational risk: “operational risk can be seen as a general term which applies to all risk factors which influence the volatility of the firm’s cost structure as opposed to its revenue structure.”

12. Regulatory Capital and the Supervision of Financial Institutions: Some Basic Distinctions and Policy Choices. Arturo Estrella. January 2000. A discussion of regulatory capital for banks, with substantial but not absolute overlap with the BIS’ 1999 recommendations.

*From the Office of the Superintendent of Financial Institutions (OSFI)*

13. Supervisory Framework: 1999 and beyond. August 1999. Available online at the following site: <http://www.osfi-bsif.gc.ca/AndreE/supervis.htm>. Canada’s Office of the Superintendent of Financial Institutions (OSFI) has drafted a framework for a series of basic risk principles including: 1. Better evaluation of risks through separate assessment of inherent risks and risk management processes, 2. Greater emphasis on early identification of emerging risks and system-wide risks, 3. Cost effective use of resources through a sharper focus on risk, and 4. Reporting of risk focussed assessments. OSFI recommends a six-step risk management process that includes analysis, planning, action, documentation, reporting, and follow-up.

*From the Financial Services Authority (FSA)*

14. Risk Based Approach to Supervision of Banks. June 1998. Available online at the following site: <http://finaserv02.uuhost.uk.uu.net/pubs/policy/p10.pdf>. This paper discusses the Financial Services Authority’s risk based approach to the supervision of banks, and its framework for merging the RATE (Risk Assessment, Tools of Supervision, Evaluation) and SCALE (Schedule 3 Compliance Assessment, Liaison, Evaluation) methodologies. A step-by-step description of both RATE and SCALE, and the FSA’s regulatory responsibilities are included. In addition, the FSA states that it is “committed to adopting a flexible and differentiated risk based approach to setting standards and to supervision, reflecting the nature of the business activities concerned, the extend of risk within particular firms and markets, and quality of firms’ management controls and the relative sophistication of the consumers involved.”

*From the Bank of England*

15. Handbook in Central Banking. No. 7. Basic Principles of Banking Supervision. Derrick Ware. May 1996. Available online at the following site: [www.bankofengland.co.uk/c/s.dll/empower.exe](http://www.bankofengland.co.uk/c/s.dll/empower.exe). Includes a discussion of “systemic problems” that failures within any one bank can contribute to the banking system, operational risks, and ownership/management risks. The document recommends against the excessive concentration of risk in any one sector and stresses the importance of segregation of duties. It also targets the role of the internal auditor as one of great importance in relation to systems and controls.

*From the European Commission*

16. A Review of Capital Requirements for EU Credit Institutions and Investment Firms. November 1999. Available online at the following site: <http://www.ecb.int>. A consultative document that complements the Basel Committee review on the capital adequacy of banks with emphasis on credit risk. The document, however, does devote significant space to “other risks” and recommends a specific capital charge aimed to cover operational, legal, and reputational risk.
17. Commission Services’ Second Consultative Document on Review of Regulatory Capital for Credit Institutions and Investment Firms. February 2001. This document updates the previously issued one above, and contends on specific European Union concerns. It also offers capital adequacy suggestions for credit and investment companies, and solicits comments before May 31, 2001. It provides an European context to the recent consultative paper on capital requirements released by the Bank for International Settlements.

*From Global Association of Risk Professionals*

18. An Approach to Modelling Operational Risk in Banks. October 1999. [www.garp.com](http://www.garp.com). Discussion of the Reliability Theory in predicting operational risk events.
19. Operational Risk: Current Issues and Best Practices. July 1999. A slide show of GARP's approach to operational risk.

*From the British Bankers Association*

20. Operational Risk Data Pooling. February 2000. [www.bba.org.uk](http://www.bba.org.uk). An overview of the conclusions from meetings of the BBA Operational Risk Advisory Panel members on an effort to share operational risk data.
21. The New Capital Adequacy Framework. 1999. The BBA recommends requiring a benchmark operational risk capital charge based upon high level business activity indicators.
22. Operational Risk Management Survey. The first three chapters of the joint study with ISDA and RMA titled: Operational Risk: The Next Frontier is available online at the BBA's site.

*From the International Institute of Finance*

23. The Internal Measurement Approach to Operational Risk Regulatory Capital. (Option 3). October 13, 2000. The Industry Technical Working Group on Operational Risk responds to the Basel request for response to the internal measurement approach (option 3) to its recommendations for calculating operational risk. This is a technical paper, which befits a rather complicated capital approach.
24. Working Paper on Operational Risk Regulatory Capital. July 2000. The Industry Technical Working Group on Operational Risk. Provides brief discussion of the three methods for establishing capital charges (single indicator, standardized lines of business, internal risk based approach).
25. The Evolutionary Framework: Qualifying Criteria for Each Stage and Other Qualitative Factors. Industry Technical Working Group. October 2000. Describes a recommended framework for advancing along the evolutionary framework of capital charges (from option one – basic indicator approach – through option three – the internal measurement approach.) The methodology here is based on an earlier paper published by the Bank of Japan titled “Internal Risk Based Approach.”
26. Response to RMG Request of 1 Nov 2000. Data & Definitions. Industry Technical Working Group. November 2000. Data Standards based on a consensus reached among a small group of representatives from primarily US and Canadian-based mid-sized banks during a two day conference.
27. Report of the Working Group on Capital Adequacy: Response to the Basel Committee on Banking Supervision, Regulatory Capital Reform Proposals. April 2000. [www.iif.org](http://www.iif.org). The IIF has formed a steering committee on regulatory reform which has recommended that banks be allowed to use their own internal rating systems. The organization also held a series of private meetings with a group of industry representatives, and has been critical of the BIS' "business line approach" as a valid method for operational risk assessment.
28. Report of the Steering Committee on Regulatory Capital: Response to the Basel Committee on Banking Supervision, Regulatory Capital Reform Proposals. April 2000.

*From the Bank of Japan*

29. Measuring Operational Risk in Japanese Major Banks. June 2000. Discussion of the new focus among Japanese banks on operational risk and their mostly “bottom-up” approach. The document includes discussions of scenario analysis, methods for allocating capital, and the importance of internal data and external data.
30. Internal Risk Based Approach: Evolutionary Approaches to Regulatory Capital Charge for Operational Risk. 1999. This paper discusses the Bank of Japan's Internal Risk Approach which is viewed as a bridge between the basic approach and the more complicated “full model” one. The paper presents recommendations for the “evolutionary” journey through the various levels of complexity.



31. Challenges and Possible Solutions in Enhancing Operational Risk Measurement. 2000. A summary of responses to its earlier “Measuring Operational Risk” paper.