

**THE REQUIRED ELEMENTS OF AN EFFECTIVE OPERATIONAL RISK  
FRAMEWORK TO MEET THE GLOBAL REGULATORY REQUIREMENTS OF  
BASEL II**

by

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## **ABSTRACT OF THE DISSERTATION**

The required elements of an effective operational risk framework to meet the global regulatory requirements of Basel II

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The definition of operational risk adopted under Basel II is  
“Operational risk is defined as the risk of loss resulting from inadequate or failed processes, people and systems or from external events.”

Regulatory requirements for operational risk management and measurement have been established under the Basel II rule, with local implementation rules developed by national regulators. The cost of operational risk losses and the impact of operational risk on share value have been established. As a result of these regulatory and financial drivers, financial services firms are seeking robust operational risk frameworks to enable them to meet the four core operational risk requirements to identify, assess, control, and mitigate operational risk.

This paper researches the regulatory landscape including a historical review of The Bank of International Settlements (BIS) rules regarding operational risk. The author reviews the local rules that have been adopted in the United States and across Europe. This review includes the Group of Twenty (G20) push for stronger adoption of risk regulation since the financial crisis began

in 2007, including U.S. Dodd-Frank legislation, European Directives, Sound Practices documents and Basel III.

The paper analyzes sources of operational risk data to determine the size of operational risk losses and the main drivers for those losses. IBM Algo FIRST subscription data and ORX consortium data sources are used for this analysis. The relative biases in subscription data and consortium data are discussed. In addition, a literature review summarizes previous findings regarding the impact of operational risk and reputational risk events on share value. This review is supplemented by original analysis of the impact on share price and trading volumes as a result of the recent JP Morgan Whale operational risk event.

The paper concludes with a recommended operational risk framework for the implementation of the important elements of an effective operational risk framework. These elements include the foundations of governance, risk appetite, culture and awareness, and policy and procedure; the building blocks of data collection including loss data, risk and control self-assessment, scenario analysis, and key risk indicators; and the final capstones of calculation of capital and reporting.

## **Preface**

In 2004, the Basel II rules were implemented, introducing a new era of operational risk management. The evolution of operational risk over the past 10 years has given rise to a new profession: the operational risk manager. Best practices and regulatory guidelines are now readily available for both the qualitative and the quantitative elements of operational risk, and this paper establishes the operational risk framework elements that are necessary in order to meet the Basel II regulatory requirements. The framework proposed provides practical steps to ensure effective identification, assessment, monitoring, and mitigation of operational risks. In starker terms, how can you find operational risk, size it, watch it, and kill it (or choose to accept it)?

The author explores how the operational risk regulatory framework was established and how it has evolved over the past few years in response to the recent economic crises.

The author examines the cost of operational risk to the financial services industry globally, both in absolute losses and in share price decline, including analysis of the JP Morgan Whale event.

Finally, the author proposes an operational risk framework to meet both global regulatory expectations and the industry's risk management goals.

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## Chapter 1: Definition and Drivers of Operational Risk

### The Definition of Operational Risk

What do we mean by operational risk? Operational risk management had been defined in the past as all risk that is not captured in market and credit risk management programs. Early operational risk programs, therefore, took the view that if it was not market risk, and it was not credit risk, then it must be operational risk. However, today a more concrete definition has been established, and the most commonly used of the definitions can be found in the International Convergence of Capital Measurement and Capital Standards: A Revised Framework regulations. These regulations are commonly known as “Basel II”. The Basel II definition of operational risk is:

...the risk of loss resulting from inadequate or failed processes, people and systems or from external events.

This definition includes legal risk, but excludes strategic and reputational risk (Basel Committee for Banking Supervision, 2004).

Let us break this definition down into its components. First, there must be a risk of loss. So for an operational risk to exist there must be an associated loss anticipated. The definition of “loss” will be considered more fully when we look at internal loss data in Chapter 3, but for now we will simply assume that this means a financial loss.

Next, let us look at the defined causes of this loss. The preceding definition provides four causes that might give rise to operational risk losses.

These four causes are (1) inadequate or failed processes, (2) inadequate or failed people (the regulators do not get top marks for their grammar, but we know what they are getting at), (3) inadequate or failed systems, or (4) external events.

While the language is a little awkward (what exactly are “failed people,” for example), the meaning is clear. There are four main causes of operational risk events: the person doing the activity makes an error, the process that supports the activity is flawed, the system that facilitated the activity is broken, or an external event occurs that disrupts the activity.

With this definition in our hands, we can simply look at today’s newspaper or at the latest online headlines to find a good sample of operational risk events. Failed processes, inadequate people, broken systems, and violent external events are the mainstay of the news. Operational risk surrounds us in our day-to-day life.

Examples of operational risk in the headlines in the past few years include egregious fraud (Madoff, Stanford), breathtaking unauthorized trading (Société Générale and UBS), shameless insider trading (Raj Rajaratnam, Nomura, SAC Capital), stunning technological failings (Knight Capital, Nasdaq Facebook IPO, anonymous cyber-attacks), and heartbreaking external events (hurricanes, tsunamis, earthquakes, terrorist attacks). We will take a deeper look at several of these cases throughout the dissertation.

All of these events cost firms hundreds of millions, and often billions, of dollars. In addition to these headline-grabbing large operational risk

events, firms constantly bleed money due to frequent and less severe events. Broken processes and poorly trained staff can result in many small errors that add up to serious downward pressure on the profits of a firm.

The importance of these types of risks, both to the robustness of a firm and to the systemic soundness of the industry, has led regulators to push for strong operational risk frameworks, and has driven executive managers to fund and support such frameworks.

The Basel II definition of operational risk has been adopted or adapted by many firms and is now generally accepted as the standard. It has been incorporated into national regulations across the globe with only minor adaptations and is consistently referred to by regulators and operational risk managers.

Basel II is the common name used to refer to the “International Convergence of Capital Measurement and Capital Standards: A Revised Framework,” which was published by the Bank for International Settlements in Europe in 2004.

The Basel II framework set out new risk rules for internationally active financial institutions that wished to continue to do business in Europe. These rules related to the management and capital measurement of market and credit risk, and introduced a new capital requirement for operational risk. In addition to the capital requirement for operational risk, Basel II laid out qualitative requirements for operational risk management, and so a new era of operational risk management development was born.

JPMorgan Chase has adapted the definition very simply as follows:

Operational risk is the risk of loss resulting from inadequate or failed processes or systems, human factors or external events (JP Morgan, 2008).

Deutsche Bank has a more creative interpretation:

Operational risk is the potential for failure (incl. the legal component) in relation to employees, contractual specifications and documentation, technology, infrastructure and disasters, external influences and customer relationships. Operational risk excludes business and reputational risk (Deutsche Bank , 2011).

Under the Basel II definition, legal events are specifically included in the definition of operational risk, and a footnote is added to further clarify this.

Legal risk includes, but is not limited to, exposure to fines, penalties, or punitive damages resulting from supervisory actions, as well as private settlements<sup>1</sup>.

This is a helpful clarification, as there is often some tension with the legal department when the operational risk function first requests information on legally related events. This is something that will be considered in more detail later in the chapter on loss data collection.

The Basel II definition also specifically excludes several items from operational risk:

This definition includes legal risk, but excludes strategic and reputational risk<sup>2</sup>.

These nuances in the Basel II definition are often reflected in the definition adopted by a firm, whether or not they are governed by that regulation. However, these exclusions are not always applied in operational risk frameworks.

For example, some firms have adopted definitions of operational risk that include reputational risk. For example, Citi's definition includes reputational risk:

Operational risk is the risk of loss resulting from inadequate or failed internal processes, systems or human factors, or from external events. It includes the reputation and franchise risk associated with business practices or market conduct in which Citi is involved (Citi, 2011).

In this paper will be examining ways that operational risk management and measurement can meet the underlying need to accomplish five tasks:

1. Identifying operational risks.
2. Assessing the size of operational risks.
3. Monitoring and controlling operational risks.
4. Mitigating operational risks.
5. Calculating capital to protect you from operational risk losses.

These five requirements occur again and again in global and national regulations and are the bedrock of successful operational risk management.

In addition to putting these tools in place, a robust operational risk framework must look at all types of operational risk. There are seven main categories of operational risk as defined by Basel II<sup>3</sup>.

1. Internal Fraud
2. External Fraud
3. Employment Practices and Workplace Safety
4. Clients, Products, and Business Practices

5. Damage to Physical Assets
6. Business Disruption and System Failures
7. Execution, Delivery, and Process Management

Operational risk has some similarities to market and credit risk.

Most important, it should be actively managed because failure to do so can result in a misstatement of an institution's risk profile and expose it to significant losses.

However, operational risk has some fundamental differences to market and credit risk. Operational risk, unlike market and credit risk, is typically not directly taken in return for an expected reward. Market risk arises when a firm decides to take on certain products or activities. Credit risk arises when a firm decides to do business with a particular counterparty. In contrast, operational risk exists in the natural course of corporate activity. As soon as a firm has a single employee, a single computer system, a single office, or a single process, operational risk arises.

While operational risk is not taken on voluntarily, the level of that risk can certainly be impacted by business decisions. Operational risk is inherent in any enterprise, but strong operational risk management and measurement allows for that risk to be understood and either mitigated or accepted.

### **Operational Risk Management and Operational Risk Measurement**

There are two sides to operational risk: operational risk management and operational risk measurement. There is often tension between these two activities, as well as overlap. Basel II requires capital to be held for operational risk and offers several possible calculation methods for that capital,

which will be discussed later in this chapter. This capital requirement is the heart of the operational risk measurement activities and requires quantitative approaches.

In contrast, firms must also demonstrate that they are effectively managing their operational risk, and this requires qualitative approaches. A successful operational risk program combines qualitative and quantitative approaches to ensure that operational risk is both appropriately measured and effectively managed.

### **Operational Risk Management**

Helpful guidelines for appropriate operational risk management activities in a firm can be found in Pillar 2 of Basel II:

736. Operational risk: The Committee believes that similar rigour should be applied to the management of operational risk, as is done for the management of other significant banking risks. ...

737. A bank should develop a framework for managing operational risk and evaluate the adequacy of capital given this framework. The framework should cover the bank's appetite and tolerance for operational risk, as specified through the policies for managing this risk, including the extent and manner in which operational risk is transferred outside the bank. It should also include policies outlining the bank's approach to identifying, assessing, monitoring and controlling/mitigating the risk. (Basel Committee for Banking Supervision, 2004)

There are several important things to note in these sections. First, operational risk should be managed with the same rigor as market and credit risk. This is an important concept that has many implications when considering how to embed an operational risk management culture in a firm.

Second, policies regarding risk appetite are required. This is no easy task, as articulating a risk appetite for operational risk can be very

challenging. Most firms would prefer to have no operational risk, and yet these risks are inherent in their day-to-day activities and cannot be completely avoided. Recently, regulators have been very interested in how firms are responding to this challenge, and there is much debate about how to express operational risk appetite or tolerance and how to manage against it. This will be explored further in each of the framework sections later in the chapter.

Finally, policies must be written that outline the bank's approach to "identifying, assessing, monitoring, and controlling/mitigating" operational risk. This is the heart of the definition of operational risk management, and the elements of an operational risk framework need to address these challenges. Does each element contribute to the identification of operational risks, the assessment of those risks, the monitoring of those risks, and the control or mitigation of those risks? To be successful, an operational risk framework must be designed to meet these four criteria for all operational risk exposures, and it takes a toolbox of activities to achieve this.

In the operational risk management toolbox are loss data collection programs, risk and control self-assessments, scenario analysis activities, key risk indicators, and powerful reporting. Each of these elements will be considered in turn in this paper.

### **Operational Risk Measurement**

Operational risk measurement focuses on the calculation of capital for operational risk, and Basel II provides for three possible methods for calculating operational risk capital, which will be discussed later. Some firms choose to

calculate operational risk capital, even if they are not subject to a regulatory requirement, as they wish to include the operational risk capital in their strategic planning and capital allocation for strategic and business reasons.

### **The Relationship between Operational Risk Management and Other Risk Types**

Operational risk often arises in the presence of other risk types, and the size of an operational risk event may be dramatically impacted by market or credit risk forces.

This can best be illustrated by a fictional example:

One of Gamma Bank's business lines offers retail customers the ability to trade bonds. One of the customers calls the broker at Gamma Bank and instructs the broker to buy Andromeda Corporation bonds for the customer's account. The trade is executed, but it is mistakenly booked as a sell, instead of a buy; this will result in a significantly larger loss if the market moves up. The cost of making the customer whole will now be much higher than if the market had remained stable. In fact, there could be a gain if the market drops. It is clear, then, that market risk can magnify operational risk.

There are also events that include both credit and operational risk elements. If a counterparty fails, and there was an operational error in securing adequate collateral, then the credit risk event is magnified by operational risk.

While market risk, credit risk, and operational risk functions are usually run separately, there are benefits in integrating these functions where

possible. The overall risk profile of a firm depends not on the individual market, credit, and operational risks, but also on elusive strategic and reputational risks (or impacts) and the relationships among all of these risk categories.

### Enterprise Risk Management

Additional risk categories also exist—for example, geopolitical risk and liquidity risk. For these reasons, some firms adopt an enterprise risk management (ERM) view of their risk exposure. It is important to consider the role of operational risk management as an element in ERM and to appreciate its relationship with all other risk types. The relationship among risks can be illustrated in Figure 1

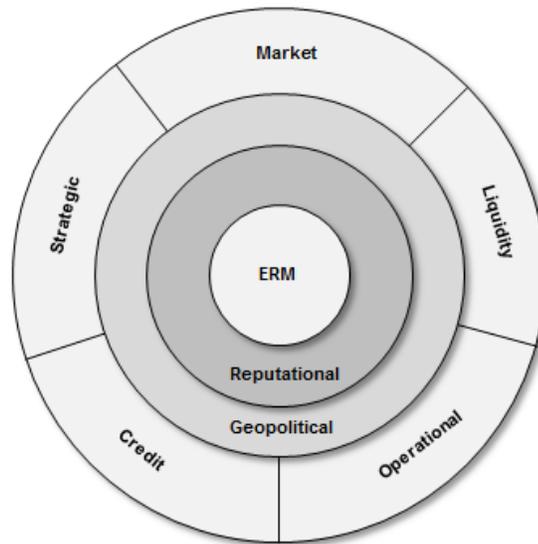


Figure 1: Enterprise Risk Management Wheel

This ERM wheel illustrates that all risk types are interrelated and that central risk types can have an impact on risk types on the outer spokes of the wheel. For example a geopolitical risk event might result in risks arising in market risk, credit risk, strategic risk, liquidity risk, and operational risk.

For example, if a country's government banned trades in a particular type of derivative. This ban could result in market risk (the value of the derivatives plummets), credit risk (counterparties who are concentrated in this product might fail), strategic risk (the business model might rely on growth in that product), and operational risk (certain activities might now be illegal).

Similarly, reputational risk or reputational impact can occur as a result of any risk event and so is at the center of the ERM wheel. This is just one possible model for the relationship between risk types and simply illustrates the complexity of effective ERM. Operational risk sits on the ERM wheel and is best managed and measured with that in mind.

### **Drivers of Operational Risk Management**

Operational risk management has arisen as a discipline as a result of drivers from three main sources: regulators, senior management, and third parties.

In addition to Basel II, there are other regulatory drivers for operational risk management including Solvency II, which imposes Basel-like requirements on insurance firms, and a host of local regulations such as the Markets in Financial Instruments Directive (MiFID) legislation in Europe and the Sarbanes-Oxley Act (which includes risk and control requirements for financial statements) in the United States. The regulatory evolution of operational risk is discussed in Chapter 2.

Additional business drivers from within the banks and from third parties complement the many regulatory drivers of operational risk management.

One of the most important of these additional drivers is that senior management and the board both want to be fully informed of the risks that face the firm, including operational risk exposures. They are fully aware that operational risk events can have catastrophic financial and reputational impact. An effective operational risk program should provide transparency of operational risk exposure to allow senior management to make strategic business decisions fully informed of the operational risk implications.

A strong operational risk framework provides transparency into the risks in the firm, therefore allowing for informed business decision making. With a strong operational risk framework, a firm can avoid bad surprises and equip itself with tools and contingency planning to be able to respond swiftly when an event does occur.

Furthermore, external third parties have started to ask about the operational robustness of a firm.

Ratings agencies, investors, and research analysts are now aware of the importance of operational risk management and often ask for evidence that an effective operational risk framework is in place, and whether sufficient capital is being held to protect a firm from a catastrophic operational risk event.

## **Chapter 2: The Regulatory Push for Operational Risk Management**

The regulation of operational risk is globally founded on Basel II. This chapter discusses the regulatory response to the Basel Capital Accords (commonly known as Basel I and Basel II) that were presented by the Basel Banking Committee of the Bank of International Settlements in 1988 and 2004, which were intended to provide a robust capital framework and risk management approach for internationally active banks.

The focus of this chapter is on (1) the history of the Basel Accords; (2) the rules of the Basel Accords; (3) the adoption of Basel II in Europe and (4) in the United States; (5) the impact of the financial crisis and resulting European and U.S. regulatory changes, including the Dodd-Frank regulation in the United States; and, finally, (6) the future of Basel regulation and the role of operational risk management.

### **History of the Basel Accords**

The Basel Accords were developed by the Bank of International Settlements (BIS), which is headquartered in Basel, Switzerland. The BIS describes its mission and activities as follows:

BIS is an international organization which fosters international monetary and financial cooperation and serves as a bank for central banks.

The BIS fulfills this mandate by acting as:

- a forum to promote discussion and policy analysis among central banks and within the international financial community
- a center for economic and monetary research
- a prime counterparty for central banks in their financial transactions
- agent or trustee in connection with international financial operations (Bank of International Settlements)<sup>4</sup>

The BIS was originally established in 1930 to assist with the management of reparation loans post World War I, but it soon transitioned into a body that addressed monetary and financial stability through statistical analysis, economic research, and regular meetings between central bank governors and other global financial experts.

Over the years, the BIS has established several standing committees to take on the important financial topics of the day. It was heavily involved in supporting the Bretton Woods System in the early 1970s, and tackled the challenges of cross-border capital flows and the importance of financial regulation in the late 1970s and 1980s. In 1974, the G10 nations<sup>5</sup> formed the BIS Basel Committee on Banking Supervision to address shortcomings in the regulation of internationally active banks. The committee membership has now grown to include 27 countries' central banks and monetary authorities.<sup>6</sup>

In 1988, the Basel Committee on Banking Supervision published the Basel Capital Accord<sup>7</sup> (commonly known today as Basel I) to provide a framework for the consistent and appropriate regulation of capital adequacy and risk management in internationally active banks. In 2004, the Basel Committee published a revised framework (Basel Committee for Banking Supervision,

2004), which came to be known as Basel II. Today, the Basel Committee has four subcommittees: the Standards Implementation Group, the Policy Development Group, the Accounting Task Force, and the Basel Consultative Group, each of which also has its own subcommittees and working groups.

By its own admission, the Basel Committee has no legal authority over member central banks:

The Committee does not possess any formal supranational supervisory authority, and its conclusions do not, and were never intended to, have legal force. Rather, it formulates broad supervisory standards and guidelines and recommends statements of best practice in the expectation that individual authorities will take steps to implement them through detailed arrangements—statutory or otherwise—which are best suited to their own national systems. In this way, the Committee encourages convergence towards common approaches and common standards without attempting detailed harmonization of member countries' supervisory techniques. ( Bank of International Settlements)

However, the U.S. Federal Reserve, along with the majority of member central banks, moved forward with national regulatory implementation of most of the Basel Committee recommendations.

### **Rules of the Accords**

The Basel Accords outline rules for financial institutions and for the national regulators who supervise those institutions.

#### **Basel I**

In 1988, the BIS Basel Committee on Banking Supervision published the International Convergence of Capital Measurement and Capital Standards (commonly known then as the Basel Capital Accord and today as

Basel I). The report aimed to “secure international convergence of supervisory regulations governing the capital adequacy of international banks” (Basel Committee for Banking Supervision, 1988). Balin outlined the four “pillars” of Basel I as the Constituents of Capital, the Risk Weights, a Target Standard Ratio, and Transitional and Implementing Agreements. (Balin, 2008)

Basel I focused on credit risk and assigned different weightings (0 percent, 10 percent, 20 percent, 50 percent, and 100 percent) for capital requirements, depending on the level of credit risk associated with the asset. Later amendments to Basel I added further weightings to accommodate more sophisticated instruments. The Target Standard Ratio set a minimum standard whereby 8 percent of a bank’s risk-weighted assets had to be covered by Tier 1 and Tier 2 capital reserves.

There were no requirements to either manage or measure operational risk under the Basel Accord.

The Basel Accord was adopted with relative ease by the G10 nations who were members of the Basel Banking Committee at that time, including the United States. In the United States, the Basel recommendations were codified in Title 12 of the United States Code and Title 12 of the Code of Federal Regulations.

The Basel Accord (Basel I) was seen as a safety and soundness standard that would protect banks from insolvency and the minimum capital requirements provided a standard below which regulators would not permit a

bank to continue to conduct business. However, regulators soon began to question whether Basel I adequately captured the risks of the increasingly complex and changing financial markets. In addition, banks were able to “game” the system by moving assets off balance sheet and by manipulating their portfolios to minimize their required capital, while not necessarily minimizing their actual risk exposure.

## **Basel II**

As pressure mounted for a revised approach, the Basel Committee responded by proposing a revised Capital Adequacy Framework in June 1999. They described the new proposed capital framework as consisting of three pillars: “minimum capital requirements; ... supervisory review of an institution’s internal assessment process and capital adequacy; and effective use of disclosure to strengthen market discipline as a complement to supervisory efforts.” ( Bank of International Settlements)

Comments and discussions were held over the next few years, with the newly broadened membership of the Committee providing a global perspective on the proposed changes. The International Convergence of Capital Measurement and Capital Standards, a Revised Framework was issued on June 26, 2004, and served as a basis for national rule-making to reflect the Basel II approaches. The Basel Committee outlined the goal of the revised framework as follows:

The Basel II Framework describes a more comprehensive measure and minimum standard for capital adequacy that national supervisory authorities are now working to

implement through domestic rule-making and adoption procedures. It seeks to improve on the existing rules by aligning regulatory capital requirements more closely to the underlying risks that banks face. In addition, the Basel II Framework is intended to promote a more forward-looking approach to capital supervision, one that encourages banks to identify the risks they may face, today and in the future, and to develop or improve their ability to manage those risks. As a result, it is intended to be more flexible and better able to evolve with advances in markets and risk management practices. (Basel II: Revised International Capital Framework, 2012)

On July 4, 2006, the Committee issued an updated version of the revised framework incorporating additional guidance and including those sections of Basel I that had not been revised. The revised framework is almost 10 times the length of Basel I, running to over 300 pages. For the first time, operational risk management and measurement were required.

Basel II consists of three pillars: Pillar 1—Minimum Capital Requirements, Pillar 2—Supervisory Review Process, and Pillar 3—Market Discipline.

### **Pillar 1**

The major changes to the capital adequacy rules are outlined in detail in Pillar 1. Basel II requires banks to hold capital for assets in the holding company, so as to prevent banks from avoiding capital by moving assets around within its corporate structure.

### **Credit Risk**

Pillar 1 offers three possible approaches to calculating credit risk: the standardized approach, the foundation internal ratings based (F-IRB) approach, and, finally, the advanced IRB approach.

Under the standardized approach a bank uses “authorized” rating institution ratings in order to assign risk weightings and to calculate capital.

Under the IRB approaches, the banks may take advantage of capital improvements on the standardized approach by applying their own internal credit rating models. Under F-IRB, a bank may develop their own model to estimate the probability of default (PD) for individual clients or groups of clients, subject to approval from their local regulators. F-IRB banks are required to use their regulator’s prescribed loss given default (LGD) and to calculate the risk-weighted asset (RWA) and the final required capital.

Under advanced IRB (A-IRB), banks may use their own estimates for PD, LGD, and exposure at default (EAD) to calculate RWA and the final required capital.

### **Market Risk**

Pillar 1 also provides market risk capital requirements, based mainly on a value at risk (VaR) approach.

### **Operational Risk**

Finally, Pillar 1 introduces a new risk category: operational risk. As discussed in Chapter 1, operational risk is defined in Basel II as the “risk of loss resulting from inadequate or failed internal processes, people and systems or

from external events. This definition includes legal risk, but excludes strategic and reputational risk”. (Basel Committee for Banking Supervision, 2006)

Pillar 1 offers three possible methods to calculate capital for operational risk: the basic indicator approach (BIA), the standardized approach (TSA) or the advanced measurement approach (AMA).<sup>8</sup>

Under BIA, capital is simply calculated from a percentage (currently set at 15 percent) of the average of the last three years’ revenue. TSA offers different percentage weightings depending on the business line—ranging from 12 percent for retail banking to 18 percent for sales and trading. AMA offers banks the opportunity to develop their own risk-based model for calculating operational risk capital. AMA requires that the model include four elements: internal loss data, external loss data, scenario analysis, and business environment and internal control factors. These three methods are summarized in Figure 2.

| BASIC INDICATOR APPROACH  | THE STANDARDIZED APPROACH  | ADVANCED MEASUREMENT APPROACH |     |                   |                        |                    |     |                 |                |     |                  |                  |   |                    |                    |                   |                      |                          |
|---|--|-------------------------------|-----|-------------------|------------------------|--------------------|-----|-----------------|----------------|-----|------------------|------------------|---|--------------------|--------------------|-------------------|----------------------|--------------------------|
| $\sum \text{avg 3yr gross revenue} \times \alpha$ <p><math>\alpha</math> is 15%</p> | $\sum \text{avg 3yr gross revenue} \times \beta$ <p><math>\beta</math> for each business line is:</p> <table border="1" data-bbox="670 1438 974 1680"> <tbody> <tr> <td>Corporate Finance</td> <td rowspan="3">18%</td> </tr> <tr> <td>Trading and Sales</td> </tr> <tr> <td>Payment and Settlement</td> </tr> <tr> <td>Commercial Banking</td> <td rowspan="2">15%</td> </tr> <tr> <td>Agency Services</td> </tr> <tr> <td>Retail Banking</td> <td rowspan="3">12%</td> </tr> <tr> <td>Retail Brokerage</td> </tr> <tr> <td>Asset Management</td> </tr> </tbody> </table> | Corporate Finance             | 18% | Trading and Sales | Payment and Settlement | Commercial Banking | 15% | Agency Services | Retail Banking | 12% | Retail Brokerage | Asset Management | <p><i>Regulator approved, internal risk model which includes the following inputs:</i></p> <table border="1" data-bbox="1036 1409 1333 1562"> <tbody> <tr> <td>Internal Loss Data</td> </tr> <tr> <td>External Loss Data</td> </tr> <tr> <td>Scenario Analysis</td> </tr> <tr> <td>Business Environment</td> </tr> <tr> <td>Internal Control Factors</td> </tr> </tbody> </table> | Internal Loss Data | External Loss Data | Scenario Analysis | Business Environment | Internal Control Factors |
| Corporate Finance   | 18%  |                               |     |                   |                        |                    |     |                 |                |     |                  |                  |   |                    |                    |                   |                      |                          |
| Trading and Sales   |  |                               |     |                   |                        |                    |     |                 |                |     |                  |                  |   |                    |                    |                   |                      |                          |
| Payment and Settlement  |  |                               |     |                   |                        |                    |     |                 |                |     |                  |                  |   |                    |                    |                   |                      |                          |
| Commercial Banking  | 15%  |                               |     |                   |                        |                    |     |                 |                |     |                  |                  |   |                    |                    |                   |                      |                          |
| Agency Services   |  |                               |     |                   |                        |                    |     |                 |                |     |                  |                  |   |                    |                    |                   |                      |                          |
| Retail Banking  | 12%  |                               |     |                   |                        |                    |     |                 |                |     |                  |                  |   |                    |                    |                   |                      |                          |
| Retail Brokerage  |  |                               |     |                   |                        |                    |     |                 |                |     |                  |                  |   |                    |                    |                   |                      |                          |
| Asset Management  |  |                               |     |                   |                        |                    |     |                 |                |     |                  |                  |   |                    |                    |                   |                      |                          |
| Internal Loss Data  |  |                               |     |                   |                        |                    |     |                 |                |     |                  |                  |   |                    |                    |                   |                      |                          |
| External Loss Data  |  |                               |     |                   |                        |                    |     |                 |                |     |                  |                  |   |                    |                    |                   |                      |                          |
| Scenario Analysis   |  |                               |     |                   |                        |                    |     |                 |                |     |                  |                  |   |                    |                    |                   |                      |                          |
| Business Environment  |  |                               |     |                   |                        |                    |     |                 |                |     |                  |                  |   |                    |                    |                   |                      |                          |
| Internal Control Factors  |  |                               |     |                   |                        |                    |     |                 |                |     |                  |                  |   |                    |                    |                   |                      |                          |

Figure 2: Three Capital Calculation Approaches for the Treatment of Operational Risk under Pillar 1 of Basel II

While Pillar 1 offers three possible methods to calculate operational risk capital, most large banks have found that their local regulator requires them to pursue an AMA approach. In addition, even where a bank is not required to take an AMA approach to calculating capital, their regulator often advises them that they should adopt best practices and that best practices require them to ensure they have fully developed all four elements of AMA.

Therefore, the standard for a strong operational risk framework is based on the effective development of internal and external loss data systems, appropriate use of scenario analysis, and effective development of business environment and internal control factors. Whether or not these are used as direct inputs into a capital model, they are considered vital elements of a sound operational risk management framework.

### **Capital Reserves**

Finally, under Pillar 1, a bank must hold capital reserves of at least 8 percent of their total credit, market, and operational risk-weighted assets:

Equation 1

$$\frac{\textit{capital}}{\textit{market risk} + \textit{credit risk} + \textit{operational risk}} \geq 8\%$$

### **Pillar 2**

Basel II introduces the Pillar 2 requirements as follows:

This section discusses the key principles of supervisory review, risk management guidance and supervisory transparency and accountability produced by the Committee with respect to banking risks, including guidance relating to, among other things, the treatment of interest rate risk in the banking book,

credit risk (stress testing, definition of default, residual risk, and credit concentration risk), operational risk, enhanced cross-border communication and cooperation, and securitization.<sup>9</sup>

Pillar 2 outlines how the regulators are expected to enforce soundness standards and provides a mechanism for additional capital requirements to cover any material risks that have not been effectively captured in Pillar 1.

### **Pillar 3**

Pillar 3 provides methods for disclosure of risk management practices and capital calculation methods to the public. The purpose of Pillar 3 is to increase transparency and to allow investors and shareholders a view into the inner risk practices of the bank.

### **Adoption of Basel II in Europe**

In the European Union, Basel II was codified through the European Parliament through the Capital Requirements Directive,<sup>10</sup> which required member states to enact appropriate local regulations by January 1, 2007, with advanced approaches available by January 1, 2008.

### **Adoption of Basel II in the United States**

In the United States, the plethora of regulators added to the complexities of implementation.

### **Securities and Exchange Commission Amendments to the Net Capital Rule**

U.S. investment banks needed to select a global Basel II regulator, and the Securities and Exchange Commission (SEC) looked for ways for them to be able to select the SEC as that regulator. To support this, the SEC adopted rules that allowed for consolidated supervised entities (CSEs) to apply to the SEC for regulatory supervision for Basel II. The five large U.S. investment banks took this opportunity: Goldman Sachs, Morgan Stanley, Bear Stearns, Merrill Lynch, and Lehman Brothers successfully applied for CSE status.

The SEC moved swiftly to make changes to its net capital rules to reflect Basel II standards (Securities Exchange Commission, June 21, 2004), and the five investment banks were quickly approved for Basel II supervision by the SEC.

### **U.S. Regulators' Adoption of New Regulations to Apply Basel II**

Meanwhile, the remaining United States banks were waiting to see whether U.S. banking regulations would be amended to apply the Basel II rules to them. Questions were raised on the appropriateness of the rules, and the audacity of the European Union in driving these global standards was hotly debated in Congress. Pressure was mounting from the regulators and the banks, and international political tensions were increasing as banks waited for the United States to move forward with Basel II rules.

On September 25, 2006, the Federal Banking Agencies (the Office of the Comptroller of the Currency (OCC), the Board of Governors of the Federal Reserve System, the Federal Deposit Insurance Corporation (FDIC), and the Office of Thrift Supervision (OTS), came together to collect comments on the

adoption of Basel II rules in the United States through two Notices of Proposed Rulemaking relating to capital requirements: New Risk-Based Capital Rules for large or internationally active U.S. banks in accordance with Basel II (Basel II Capital Accord: Notice of Proposed Rulemaking, 2006), and Market Risk Rule (Risk-Based Capital Standards: Market Risk, 2006).

On November 2, 2007, the Federal Reserve Board approved final rules to implement new risk-based capital requirements in the United States for large, internationally active banking organizations, stating:

The new advanced capital adequacy framework, known as Basel II, more closely aligns regulatory capital requirements with actual risks and should further strengthen banking organizations' risk-management practices.

'Basel II is a modern, risk-sensitive capital standard that will protect the safety and soundness of our large, complex, internationally active banking organizations. The new framework is designed to evolve over time and adapt to innovations in banking and financial markets, a significant improvement from the current system,' said Federal Reserve Board Chairman Ben S. Bernanke. (Risk-Based Capital Standards: Advanced Capital Adequacy, 2007)

On July 20, 2008, the Federal Reserve, OCC, OTS, and FDIC reached agreement regarding implementation of Basel II in the United States. There would be mandatory Basel II rules for large banks, and opt-in provisions for noncore banks as had been proposed in the Notices of Proposed Rulemaking (NPRs).

The new standards were to be transitioned into over a parallel run period, with Basel I based capital floors being set for the first three years.

Pillar 2 guidance was provided later, resulting in supervisory guidance being published on December 7, 2007. (Federal Reserve, 2007)

The Pillar 2 guidance provided for an Internal Capital Adequacy Assessment Process (ICAAP) for the implementation of Pillar 2 standards in a bank. The final rules were published in the Federal Register, mostly through amendments to Title 12.

### **Impact of the Financial Crisis**

The global economic crisis that began in 2007 led to much soul-searching by governments, regulators, and the BIS as they sought to understand how the Basel frameworks had failed to protect the global economy.

### **The Promise of Basel III**

Global political pressure has resulted in the BIS Basel Committee on Banking Supervision revisiting Basel II to consider what further regulatory and capital enhancements are needed in order to ensure global financial stability. Christopher Cox himself has been vocal about the need for regulatory reform, recently stating that “in March 2008, I formally requested that the Basel Committee address the inadequacy of the Basel capital and liquidity standards”. (Securities Exchange Commission Press Release, 2008)

The Group of Twenty (G20) has also been meeting regularly to address concerns regarding global regulatory requirements and capital adequacy. They established a Financial Stability Board (FSB) to address these concerns and to make recommendations for change, and the BIS has been

working closely with the FSB and the International Monetary Fund (IMF) to develop new recommendations to enhance the Basel framework. In April 2010, the G20 met to review a report prepared by IMF and FSB and “the main message coming through this document from central banks and regulators is that priority number one is Basel III,” two sources involved in the G20 process said. (G20 Must Make Basel III Top Priority, 2010)

Indeed, the G20 agreed to introduce Basel III by the end of 2012. Proposals for an updating of Basel II were put forward by the Basel Committee on Banking Supervision in December 2009 in two documents: “Strengthening the Resilience of the Banking Sector” (Basel Committee for Banking Supervision - Resilience, 2009) and “International Framework for Liquidity Risk Measurement, Standards and Monitoring.” (Basel Committee on Banking Supervision - Liquidity, 2009)

The Committee gathered comments and feedback, and the main recommendations were:

- An increase in Tier One capital.
- Additional capital for derivatives, securities financing and repo markets.
- Tighter leverage ratios.
- Setting aside revenue during upturns to protect against cyclicalities of markets.
- Minimum 30-day liquidity standards.

- Enhanced corporate governance, risk management, compensation practices, disclosure, and board supervision practices.

### **European Response to the Crisis**

The Committee of European Banking Supervisors (CEBS) produced the “Guidelines on the Management of Operational Risk in Market Related Activities” (Committee of European Banking Supervisors, 2010) in October 2010. They placed a heavy emphasis on the importance of strong corporate governance, an area that many saw as one of the key causes of the financial crisis. This document supplemented the earlier “Guidelines on the Scope of Operational Risk and Operational Risk Loss” (Committee of European Banking Supervisors, 2009) and rounded out the European detailed guidance on the implementation of a robust operational risk framework under Basel II.

This guidance is now used by European regulators as a measure against which to assess the operational risk frameworks of European banks.

### **U.S. Response to the Crisis**

The financial turmoil of 2007–2009 resulted in a quick and fundamental change in the way that Basel II was applied to large financial institutions in the United States. Of the original five investment banks that had opted for CSE status with the SEC, three no longer existed by 2009: Bear Stearns, Lehman Brothers, and Merrill Lynch. The remaining two, Goldman Sachs and Morgan Stanley, changed their structures to Bank Holding Companies, and they were now under the regulatory auspices of the Federal

Reserve. As a result, the SEC Basel II framework was simply no longer relevant and was formally ended by then chairman Christopher Cox on September 26, 2008. Chairman Cox maintained that the economic turmoil was not a result of SEC Basel II implementation, but instead that the voluntary opt-in nature of the regulations was to blame.

As I have reported to the Congress multiple times in recent months, the CSE program was fundamentally flawed from the beginning, because investment banks could opt in or out of supervision voluntarily. (Cox Testimony, 2010)

However, there was some speculation and criticism that the SEC had taken a light touch approach to the application of Basel II rules for its five CSEs and that it had, in fact, thereby contributed to the economic crisis. In particular, the high levels of leverage that were permitted by the investments banks were strongly debated, with suggestions that the SEC's CSE rules allowed them to lever up to levels of 30-to-1 (Madigan, 2009). The operational risk requirements of Basel II did not seem to receive strong enforcement by the SEC, and operational risk frameworks were put under intense scrutiny once the Federal Reserve moved in as the new regulator for the original CSEs.

Morgan Stanley and Goldman Sachs are currently operating their new bank status under the Basel I framework while they seek to be readmitted to the Basel II club under the Federal Reserve's Basel II regulations. The time taken to meet the Federal Reserve standards does suggest that there may be some truth to the suggestion that their previous Basel II framework under the SEC,

including the operational risk requirements, may have been relatively, and inappropriately, light.

Banks that were operating under the Federal Reserve's Basel II framework before the economic crisis are continuing to pursue their Basel II approval with no major changes. However, they too may have noticed an increased vigilance from their regulator as the current emphasis on regulatory stringency is on the upswing.

### **U.S. Interagency Guidance on Advanced Measurement Approach**

In June 2011, the United States regulators issued the Interagency Guidance on the Advanced Measurement Approaches for Operational Risk (Office of the Comptroller of the Currency, 2011). This guidance was agreed by the Board of Governors of the Federal Reserve System, the FDIC, the OCC, and the OTS.

The guidance had been long awaited and addressed several areas where the range of practices in operational risk had been broad among U.S. banks. While some of the conclusions may have been unpopular, the written guidance pointed toward a clearer path to Basel II AMA approval in the United States. However, as of the time of writing, there has still not been an approval in the United States.

### **Dodd-Frank Act**

In the United States, regulatory reform has been progressing along similar lines to those that were proposed by G20. President Barack Obama

introduced a guidance document, “A New Foundation: Rebuilding Financial Supervision and Regulation,” on June 17, 2009 (Department of the Treasury, 2009), and 2009 saw many bills introduced that addressed specific aspects of regulatory reform, often overlapping with existing Basel II rules. Davis Polk summarized these as follows:

- The Financial Stability Improvement Act as amended by the House Financial Services Committee through November 6, 2009, or the “House Interim Version.”
- The Investor Protection Act, passed by the House Financial Services Committee on November 4, 2009, or the “House Investor Protection bill.”
- The Consumer Financial Protection Agency Act, passed by the House Financial Services Committee on October 29, 2009, or the “House CFPA bill.”
- The Accountability and Transparency in Rating Agencies Act, passed by the House Financial Services Committee on October 28, 2009, or the “House Rating Agencies bill.”
- The Private Fund Investment Advisers Registration Act, passed by the House Financial Services Committee on October 27, 2009, or the “House Private Fund Investment Advisers bill.”
- The Derivatives Markets Transparency and Accountability Act, passed by the House Committee on Agriculture on October 21, 2009, or the “Peterson bill.”
- The Over-the-Counter Derivatives Markets Act, passed by the House Financial Services Committee on October 15, 2009, or the “Frank OTC bill.”
- The Federal Insurance Office Act, introduced by Representative Paul Kanjorski (D-PA) on October 1, 2009, or the “House Insurance bill.”
- The Liability for Aiding and Abetting Securities Violations Act, introduced by Senator Arlen Specter (D-PA) on July 30, 2009, or the “Specter bill.”
- Treasury Proposals released in the summer of 2009, or the “Treasury proposals.”

- The Shareholder Bill of Rights Act, introduced by Senator Charles Schumer (D-NY) on May 19, 2009, or the “Schumer bill.” (Davis Polk, 2009)

These all finally culminated in a catch-all bill, the Restoring American Financial Stability Act of 2009, which was introduced into the Senate by Senator Christopher Dodd (D-CT) and into the House of Representatives by Representative Barney Frank (D). It was subsequently renamed the “Dodd-Frank Wall Street Reform and Consumer Protection Act,” and President Obama signed the bill into law on July 21, 2010.

The full title of the Act is rather emotive:

An Act to promote the financial stability of the United States by improving accountability and transparency in the financial system, to end “too big to fail,” to protect the American taxpayer by ending bailouts, to protect consumers from abusive financial services practices, and for other purposes (Dodd-Frank, 2012).

Dodd-Frank addresses some of the Basel III issues and will result in United States regulatory changes that meet many of the Financial Stability Board recommendations. The main elements of Dodd-Frank are outlined in the summary released by the Senate Committee on Banking, Housing, and Urban Affairs under the following categories:

- **Consumer Protections with Authority and Independence:** The bill creates “a new independent watchdog, the Consumer Financial Protection Bureau, housed at the Federal Reserve, with the authority to ensure that American consumers get the clear, accurate information they need to

shop for mortgages, credit cards, and other financial products, and protect them from hidden fees, abusive terms, and deceptive practices.”

- **Ends Too Big to Fail:** The bill “ends the possibility that taxpayers will be asked to write a check to bail out financial firms that threaten the economy by: creating a safe way to liquidate failed financial firms; imposing tough new capital and leverage requirements that make it undesirable to get too big; updating the Fed’s authority to allow system-wide support but no longer prop up individual firms; and establishing rigorous standards and supervision to protect the economy and American consumers, investors and businesses.”
- **Advanced Warning System:** The bill “creates a council to identify and address systemic risks posed by large, complex companies, products, and activities before they threaten the stability of the economy.”
- **Transparency and Accountability for Exotic Instruments:** The bill “eliminates loopholes that allow risky and abusive practices to go on unnoticed and unregulated—including loopholes for over-the-counter derivatives, asset-backed securities, hedge funds, mortgage brokers and payday lenders.”
- **Federal Bank Supervision:** The bill “streamlines bank supervision to create clarity and accountability and protects the dual banking system that supports community banks.”

- **Executive Compensation and Corporate Governance:** The bill “provides shareholders with a say on pay and corporate affairs with a non-binding vote on executive compensation”
- **Protects Investors:** The bill “provides tough new rules for transparency and accountability for credit rating agencies to protect investors and businesses.”
- **Enforces Regulations on the Books:** The bill “strengthens oversight and empowers regulators to aggressively pursue financial fraud, conflicts of interest and manipulation of the system that benefit special interests at the expense of American families and businesses.” (Summary: Restoring American Financial Stability, 2009)

With President Obama having successfully entered his second term, any hopes of a full-scale repeal of Dodd-Frank have been put to rest. While there may be changes made to some of the elements of the Act, much of the main content will move forward into regulation, albeit at a slower pace than had been originally planned.

## **The Future**

The Basel Accords have resulted in global regulatory changes that have reached beyond G10, beyond G20, and into the far reaches of the global financial regulatory environment. Basel I introduced credit risk capital measures, and Basel II provided enhanced risk capital calculation for credit, market, and operational risk. The United States has played a key role on the Basel Committee for Banking Supervision that designed these accords and so it is not

surprising to find that United States regulators have consistently adopted these measures.

The recent economic crisis has highlighted the need for further refinements in the way that banks calculate and hold capital for all risk types, and the importance of sound operational risk management and measurement. In addition, it has drawn close scrutiny of the methods used to ensure there is robust risk management and healthy liquidity in the bank. Basel III was scheduled for adoption in January 2013, but at the time of writing, this deadline had been missed by both the EU and the US and a delayed and phased implementation was being crafted for implementation over the next few years.

Meanwhile, the writing and implementation of rules under Dodd-Frank and similar nation specific rules across the globe continues at a fast pace. While the operational risk framework has remained mostly unchanged since Basel II, the plethora of new regulatory requirements and governance enhancements has led to increasing complexity in managing the operational risks faced by a bank on a day to day basis. This has added further challenges to the implementation of an effective operational risk framework.

## **Chapter 3: The Cost of Operational Risk in the Financial Services Industry**

### **Single Large Events**

In 2006 Société Générale suffered a \$7 billion unauthorized trading scandal. This event provided a stark example of how operational risk can give rise to huge losses. The event had a strong impact on the operational risk discipline as it had many of the characteristics of a classic operational risk event.

### **Société Générale and the External Event that Shook the Operational Risk World**

This event is reported in IBM<sup>®</sup> Algo FIRST<sup>®</sup> as follows:

In what the Wall Street Journal (1/24/2008) called a “singular feat in the world of finance” Societe Generale announced a €4.9 billion (USD \$7.2 billion) loss on January 24, 2008, arising from the misdeeds of a single rogue trader. The bank characterized the largest rogue trading event to date as involving “elaborate fictitious transactions” that allowed Jerome Kerviel to circumvent its internal controls. The trades involved the arbitrage of “plain vanilla” stock-index futures. Mr. Kerviel had previously worked in a back office function and learned how to circumvent the bank’s systems. Although he was initially characterized by the governor of the Bank of France as a “computer genius” later he was described as an unexceptional employee who worked very hard to conceal unauthorized trading positions, which SocGen estimated to have a value of €50 billion (\$73.26 billion). The French Finance Ministry said that Kerviel’s rogue trading started in 2005; he was allegedly given a warning at the time concerning trading above prescribed limits. In addition to the €4.9 billion trading loss, the French Banking Commission levied a €4 million fine against Societe Generale on July 4, 2008, bringing the total loss amount to €4,904,000,000. On October 5, 2010, a court in Paris sentenced Mr. Kerviel to three years’ imprisonment,

plus a two year suspended sentence and ordered him to repay €4.9 billion (\$6.7 billion) to his employer<sup>11</sup>.

On October 24, 2012, a French appeals court upheld Kerviel's fraud conviction and lifetime trading ban.

This external event galvanized the operational risk world as it clearly demonstrated the dangers that exist in unmitigated operational risk. In 2008, many firms were still engaged in developing their early operational risk frameworks and were often focused on first-run delivery of new reporting, new loss data tools, and new adaptations to their risk assessment and scenario analysis programs. The regulatory requirements were paramount in many programs, with the business benefits being developed as rapidly as possible, but sometimes lagging behind the urgent regulatory pressures.

However, when the news hit of Mr. Kerviel's audacious activities and their multibillion-dollar impact on his firm many heads of operational risk found themselves in front of their executive management being asked the urgent question: "Could that happen here?"

This was a classic large operational risk event in that it resulted from numerous control failings. Mr. Kerviel's job was to make arbitrage trades that would result in small gains, but he began taking unauthorized "directional" positions starting in 2005, and these grew in size until he was discovered in January 2008.

Reports on the events suggest that Mr. Kerviel may have been more motivated by a sense of pride than an attempt to defraud the firm. His unauthorized activities did not result in secret transfers into his bank account; they resulted in huge positions at the bank.

At one point, Mr. Kerviel's activities allegedly resulted in gains for the firm that have been estimated to have been as high as €1 billion in 2007. It has been suggested that he realized that these gains were too large to explain and so pursued a strategy to reduce them. That strategy, it is alleged, resulted in losses of €1.5 billion by February 2008. The adverse market conditions that existed when Société Générale discovered the unauthorized trading and unwound the positions resulted in the loss growing to €4.9 billion.

This is an extreme example of how an operational risk event can be exacerbated by a market risk event.

IBM® Algo FIRST® provides an in-depth prose analysis of the event based on extensive press reviews. The highlights of the many contributing factors that are alleged can be summarized as follows:

1. Mr. Kerviel engaged in extensive unauthorized activities in order to demonstrate his prowess as a trader, rather than to defraud the bank.
2. He was insufficiently supervised and at times had no supervisor at all.

3. He had worked in the middle and back offices prior to becoming a trader and used his knowledge of those controls to ensure that his activities were not detected.
4. He gained password access to back office systems that allowed him to manipulate data and approve his own trades.

It is alleged that many red flags were raised but were ignored or were dismissed as unimportant.

The head of the Bank of France, Christian Noyer, said that Mr. Kerviel managed to breach “five levels of controls.” The controls were identified in the earlier Mission Green report<sup>12</sup> and included cancelled or modified transactions; transactions with deferred dates; technical (internal) counterparties; nominal (non-netted exposures) and intra-month cash flows. In addition, the second and more detailed Mission Green report<sup>13</sup> identified a host of supervisory lapses, organizational gaps, and warning signs that were never heeded.<sup>14</sup>

It is alleged that there were numerous other red flags that were not heeded including:

1. Mr. Kerviel requested an unusually high bonus due to his above market returns.
2. He frequently breached limits, and despite being reprimanded for this in the past, was able to continue to do so.
3. Concerns were raised by EUREX regarding his trading volume, but were dropped after a response from Mr. Kerviel satisfied their concerns.
4. At least 75 compliance alerts were raised, but were dismissed when

Mr. Kerviel supplied minimal, and sometimes forged, documentation to explain his unusual activity.

5. Mr. Kerviel never took his vacation time, allowing him to be on site to continue to maintain and conceal his unauthorized activities.
6. The bank had to rely on manual processing due to inadequate technology to support the increasing volumes in the market.
7. Net cash flows were monitored, whereas monitoring of nominal flows might have revealed the unauthorized activity.

IBM® Algo FIRST® categorizes this event, as shown in Table 1.

**Table 1: Classification in IBM® Algo FIRST®**

|                               |  |
|-------------------------------|--|
| Entity Type                   | Financial services/Banking/commercial/Full-service bank  |
| Business Unit Type            | Trading and Sales (BIS)/Trading  |
| Service/Product Offering Type | Derivatives, structured products, and commodities/derivative products/futures and options/equity index futures   |
| Contributory/Control Factors  | Corporate Governance/General Corporate Governance Issues, Corporate/Market Conditions/Corporate and Market Conditions, Employee Action/Inaction/Employee Misdeeds, Employee Action/Inaction\Employee Omissions, Lack of Control/Failure to Question Above-Market Returns, Lack of Control/Failure to Reconcile Daily Cash Flows, Lack of Control/Failure to Test for Data Accuracy, Lack of Control/Lack of Internal Controls, Lack of Control/Lax Security, Lack of Control/Rules, Regulations, and Compliance Issues, Management Action/Inaction/Lack Management Escalation Process, Management Action/Inaction/Undertook Excessive Risks,Omissions/Failure to Set or Enforce Proper Limits,Omissions/Failure to Supervise Employees,Omissions/Inadequate Due Diligence Efforts,Omissions/Omissions and Lapses,Organizational Structure\Inadequate Organizational Structures, Organizational |

|                        |   |
|------------------------|---|
|                        | Structure/Organizational Gap(s), Strategy Flaw/Inadequate Technology Planning Process, Organizational Structure/Organizational Structure—General, Lack of Control/Lack of Internal Controls—General, Management Action/Inaction/Undertook Excessive Risks, Omissions/Omissions—General  |
| Loss Impact            | Direct Loss/Regulatory/Compliance/Taxation Penalty (BIS)/Fines/Penalties, Direct Loss/Write-Down (BIS)/Write-Downs, Indirect Loss/Management Remediation, Indirect Loss/Ratings Agency Downgrade/Ratings Watch, Indirect Loss/Related Market Risk Losses, Indirect Loss/Reputational (Nonmonetary), Indirect Loss/Share Price |
| Loss Detection Sources | Whistle Blowing/Employee Originated   |
| Market Focus           | Institutional Services  |
| Event Trigger          | People Risk Class/Trading Misdeeds/Unauthorized Trading/Activity above Limits\Unauthorized Trading—Proprietary Accounts   |
| Basel Levels I & II    | Internal Fraud/Unauthorized Activity/Trans type unauthorized (w/monetary loss)  |
| Basel Business Line    | Investment Banking/Trading and Sales/Proprietary Positions  |
| Entity Type            | Financial Services/Banking/Commercial/Full Service Bank   |
| Business Unit Type     | Trading and Sales (BIS)/Trading   |

ORX provides a news service also, and they categorized this event as shown in Figure 3.

| Event                                     | Published in Media<br>24/Jan/2008   | Date of Occurrence – From<br>01/Jan/2005             | Date of Occurrence – To<br>20/Jan/2008                      | Discovery Date<br>19/Jan/2008 | Date of Recognition / Settlement<br>31/Dec/2007 |
|---|---|--|---|-------------------------------|---|
| Loss Amount USD<br>USD 7,232,400,000.00   | Loss Amount EURO<br>EUR 4,900,000,000.00  | Provision<br>No                                      | Boundary Risk<br>Other Risk                                 |                               |   |
| Industry Event<br>N/A                     | Scenario<br>ROGUET - Rogue Trader   | Product<br>PD0310 - Equity Derivatives               | Process<br>PC0603 - Position or Portfolio Mgt (proprietary) |                               |   |
| Parent Company<br>N/A                     | ORX Member<br>Yes   | Role of Firm<br>LS0307 - Position Taking (Principal) | AMA Status<br>N/A   |                               |   |
| Cause 1<br>CS0206 - Unauthorised Activity | Cause 2<br>CS0204 - Management / Control of Staff                                   |  | Cause 3<br>CS9999 - Not Identifiable                        |                               |   |
| Counterparty<br>LS0212 - Not Identifiable | Jurisdiction / Choice of Law<br>LS0105 - Western Europe (excluding United Kingdom ) |  | Environmental Volatility<br>LS0403 - Market Risk            |                               |   |

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**Figure 3: ORX Classification of the Société Générale Event**

The industry responded to this event with energy. Operational Risk teams met with senior management, as executive teams and boards

asked whether it could happen at their firm. Perhaps for the first time, the possible size of an OR event was fully appreciated, and the OR function had an opportunity to demonstrate its relevance and importance.

Fraud risk assessments were conducted in many firms and numerous control improvements were implemented. Mandatory vacation policies were written, and enforced. Passwords were disabled for employees that had moved to new roles. Supervisory oversight was reviewed.

Industry forums were held as operational risk managers compared notes on how best to minimize the risk such an event could not happen in the industry again. As an external data point, the event galvanized many aspects of OR frameworks across the industry and also paved the way for how to respond to future serious events.

Work plans were drawn up to evaluate the current state of the controls that had failed at Société Générale and to kick off work to remediate any control gaps that might be uncovered. RCSAs and scenario analysis were updated in the unauthorized trading aspects of internal fraud. Working groups were formed, Board packs prepared and external event tracking was enhanced. As IBM® Algo FIRST® notes in its longer description of the event:

The AFP press agency reported (October 8, 2010) that Société Générale's own efforts to enhance its internal controls in the wake of the event were

estimate to have cost the bank at least 150 million euros over a three-year period<sup>15</sup>.

The Société Générale event shocked the financial services industry, and turned the spotlight on to operational risk. However, only three years later another startlingly similar event occurred at UBS.

Despite the lessons learned from that event, the industry saw another huge unauthorized trading event at UBS in 2011. This led financial firms to revisit what they had learned from Société Générale just three years earlier and to reassess the way that they respond to large external events to ensure that the lessons have truly been learned. Operational risk losses drain the net revenue of financial services firms every year. The size of individual losses and the total losses incurred are staggering and an effective operational risk framework is needed to provide a structure for the identification and remediation of events so as to minimize this drag on the profitability of the industry.

### **Operational Risk Event Data**

There are many good online sources of operational risk event data in the form of news articles, journals, and e-mail update services. Some operational risk system vendors also have external databases that they make available on a subscription basis. For example, SAS offers an external database to its technology users, and IBM offers a subscription service called IBM<sup>®</sup> Algo FIRST<sup>®16</sup>. There are also consortiums of operational risk losses.

External events are a valuable source of operational risk information on an individual event basis and also as a benchmarking tool. Comparing internal loss patterns to external loss patterns can provide insight into whether the losses in a firm reflect the usual losses in their industry.

### **Subscription Databases**

These databases include descriptions and analyses of operational risk events, gleaned from legal and regulatory sources and from news articles, and they provide helpful data to assist with mapping the events to the appropriate business lines, risk categories and causes. The mission of these external databases is to collect tail losses and so to provide examples of potential large exposures.

The IBM® Algo FIRST®<sup>17</sup> database has collected losses from the past twenty years and they describe themselves as follows:

#### About IBM Algo FIRST

The IBM® Algo FIRST® database is a collection of external, public operational risk loss events in the form of risk case studies. Algo FIRST events are targeted at the financial sector and contain over 20 years' worth of events, which have been indexed to 13 keyword hierarchies, including Basel category and business line. Other hierarchies include control factor, event trigger, business unit type, entity type. Algo FIRST cases include detailed descriptions that break down the event to analyze root cause, identify control breakdowns, lessons learned, management response and aftermath of the event. Events can also include sections with supporting detail that timeline the event, relevant information about the institution that it happened to, or other detail about loss impacts.

The bulk of events in FIRST capture quantitative information as well as detailed qualitative analysis. This quantitative information takes the form of loss amounts that are captured at the time of the event (About IBM Algo FIRST).

## Analysis of Subscription Operational Risk Loss Data

The total operational risk losses to date by risk category in the IBM® Algo FIRST® (FIRST) database are represented in Table 2.

**Table 2: Total Operational Risk Losses Recorded to Date in Algo FIRST, Q4 2012<sup>18</sup>**

| Event Type                                | Losses (\$)              | % of Losses    | Records      | % of Records   | Average Loss (\$)  |
|---|--------------------------|----------------|--------------|----------------|--------------------|
| Business Disruption and System Failures   | 5,941,530,424            | 0.41%          | 113          | 1.54%          | 52,579,915         |
| Clients, Products, and Business Practices | 704,366,741,158          | 48.25%         | 3,381        | 46.11%         | 208,330,891        |
| Damage to Physical Assets                 | 280,556,835,241          | 19.22%         | 233          | 3.18%          | 1,204,106,589      |
| Employment Practices and Workplace Safety | 12,793,739,772           | 0.88%          | 438          | 5.97%          | 29,209,452         |
| Execution Delivery and Process Management | 97,465,053,049           | 6.68%          | 534          | 7.28%          | 182,518,826        |
| External Fraud                            | 57,551,520,972           | 3.94%          | 712          | 9.71%          | 80,830,788         |
| Internal Fraud                            | 301,091,891,856          | 20.63%         | 1,921        | 26.20%         | 156,737,060        |
| <b>Grand Total</b>                        | <b>1,459,767,312,472</b> | <b>100.00%</b> | <b>7,332</b> | <b>100.00%</b> | <b>199,095,378</b> |

The vast amount of losses collected by FIRST to date indicates the size of operational risk in the industry. A grand total of \$1,459 billion of losses have been collected in the database.

From the table it is clear that a majority of the operational risk events that are included in this database, 46 percent of all records, fall into the category of Clients, Products, and Business Practices. This category also accounts for 48 percent of the dollar value of the losses.

Internal Fraud accounts for 26 percent of the records, and this category represents 21 percent of the dollar loss amount. Damage to Physical Assets is the next most expensive category, with only 3 percent of the loss events, but an impressive 19 percent of the cost of losses. This information is further illustrated in Figure 4.

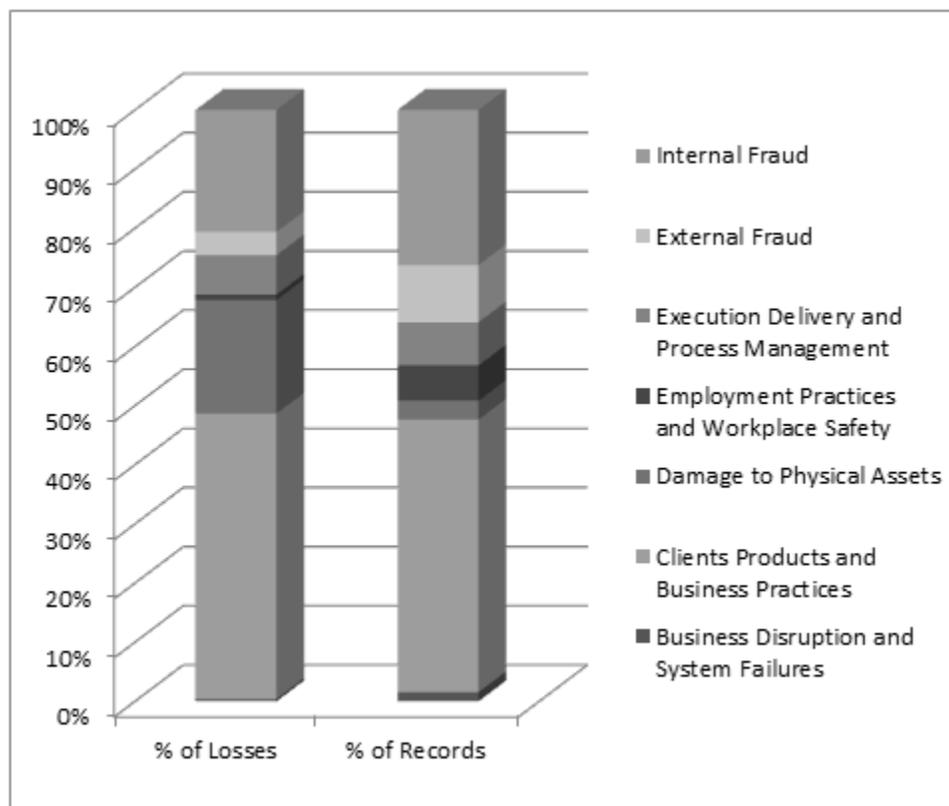


Figure 4: Percentage of Dollar Losses and Number of Events to Date for the Financial Services Industry<sup>19</sup>

This shows that in an external database such as FIRST the operational risk data collected suggests that the losses from Internal Fraud, Damage to Physical Assets, and Client, Products, and Business Practices are much more significant than those from other categories. However, it is important to note that the FIRST data includes business lines other than the Basel BIS business lines. Business lines that are not captured in the Basel II requirements fall in its scope. This accounts for the relatively high Damage to Physical Assets losses as insurance company losses are included. While insurance companies are facing Basel II type requirements under similar global requirements known as Solvency II rules, we will exclude them for the purposes of this analysis so as to ensure a more appropriate comparison to other Basel II data sources.

It is also possible to examine a subset of losses in FIRST by BIS business lines as follows. In Table 3 all losses attributed to businesses that are not one of the BIS business lines have been removed.

**Table 3: FIRST Losses to Date by BIS Business Line, Q4 2012<sup>20</sup>**

| <b>BIS Business Unit</b> | <b>Losses (\$)</b>       | <b>% of Losses</b> | <b>Records</b> | <b>% of Records</b> | <b>Average Loss (\$)</b> |
|--------------------------|--------------------------|--------------------|----------------|---------------------|--------------------------|
| Agency Services          | 4,092,601,937            | 0.35%              | 174            | 2.22%               | 23,520,701               |
| Asset Management         | 169,054,229,189          | 14.40%             | 1,284          | 16.37%              | 131,662,172              |
| Commercial Banking       | 274,983,936,373          | 23.42%             | 1,388          | 17.70%              | 198,115,228              |
| Corporate Finance        | 206,271,120,093          | 17.56%             | 706            | 9.00%               | 292,168,725              |
| Payment And Settlement   | 31,938,754,339           | 2.72%              | 463            | 5.90%               | 68,982,191               |
| Retail Banking           | 278,008,980,318          | 23.67%             | 1,631          | 20.79%              | 170,453,084              |
| Retail Brokerage         | 15,260,092,920           | 1.30%              | 810            | 10.33%              | 18,839,621               |
| Trading & Sales          | 194,759,791,628          | 16.58%             | 1,388          | 17.70%              | 140,316,853              |
| <b>Grand Total</b>       | <b>1,174,369,506,797</b> | <b>100.00%</b>     | <b>7,844</b>   | <b>100.00%</b>      | <b>149,715,643</b>       |

It can be seen from this view that although about 10 percent of events occur in Retail Brokerage, that business line has generated only 1 percent of the dollar value of the losses, as the average losses in this business line are relatively small. In contrast, Corporate Finance generated only 9 percent of the events but 18 percent of the dollar value of the losses, as losses in this line tend to be more expensive. The relative weight of loss amounts and number of events in the FIRST data is represented in Figure 5.



Figure 5: Percentage of Losses and Number of Events to Date, by BIS Business Line in FIRST

This analysis is based on the publicly available data for operational risk events and, as such, is subject to reporting bias, as will be discussed further later in this chapter.

FIRST external data is useful to financial services firms as they considers their own risk profile and compare it to the risk levels in the industry for each risk category and business line. The data also provides insight into the types of events that have occurred in the industry, but which a firm has not yet experienced itself.

### **Consortium Data**

In addition to subscription-based external data services, there are consortium-based operational risk event services that provide central data repositories and benchmarking services to their members. ORX provides such a service to its 67 members.

ORX gathers operational risk event data from its members and produces benchmarking information. It applies quality assurance standards around the receipt and delivery of data to promote members' anonymity and to provide consistency in definitions.

### **Analysis of Consortium Operational Risk Loss Data**

Unlike news-based subscription services, ORX data does not suffer from the availability bias that skews the FIRST data, which relies on public sources of data. In contrast, all operational risk events are provided anonymously into the ORX database. However, the data relate only to a subset of financial services, those member banks that provide data to ORX. ORX publishes reports that summarize the data. Table 4 is derived from ORX data and illustrates the number of losses and the amount of losses in euros for each business line and each risk category.

ORX use slightly different business lines, as they split out Retail Banking into two groups: Retail Banking and Private Banking. They also rename Payment and Settlement as Clearing.

Table 4: Number and Amount of Losses (EURO) by Business Line and Risk Category

|                        | Internal Fraud | External Fraud | Employment Practices and Workplace Safety | Clients, Products and Business Practices | Damage to Physical Assets | Business Disruptions and System Failure | Execution, Delivery, and Process Management | Total of Number of Losses, Total Amount of Losses |
|------------------------|----------------|----------------|---|--|---------------------------|---|---|---|
| Corporate Finance      | 40             | 259            | 303                                       | 589                                      | 234                       | 24                                      | 1,220                                       | 2669  |
|                        | 27,808,954     | 201,887,224    | 118,863,064                               | 10,338,924,826                           | 19,809,921                | 1,338,255                               | 1,271,895,367                               | 11,979,932,631                                    |
| Trading and Sales      | 229            | 364            | 1,275                                     | 1,941                                    | 153                       | 1,690                                   | 23,365                                      | 29017   |
|                        | 2,239,882,424  | 2,161,739,938  | 408,306,565                               | 7,433,539,652                            | 33,297,270                | 299,546,583                             | 9,914,939,994                               | 22,491,232,426                                    |
| Retail Banking         | 7,320          | 72,562         | 21,060                                    | 20,705                                   | 2,912                     | 2,132                                   | 40,660                                      | 167351  |
|                        | 1,574,185,214  | 6,900,955,788  | 2,409,914,928                             | 37,059,980,235                           | 1,024,928,564             | 1,710,492,902                           | 11,926,956,855                              | 62,607,414,487                                    |
| Commercial Banking     | 538            | 9,283          | 1,113                                     | 5,572                                    | 268                       | 558                                     | 10,975                                      | 28307   |
|                        | 689,292,132    | 3,856,185,404  | 137,864,588                               | 4,636,349,743                            | 39,160,870                | 336,939,426                             | 4,020,356,604                               | 15,765,850,768                                    |
| Clearing               | 67             | 1,219          | 129                                       | 283                                      | 11                        | 579                                     | 2,732                                       | 5020  |
|                        | 48,316,882     | 124,640,083    | 25,551,512                                | 473,570,941                              | 2,203,899                 | 88,231,353                              | 838,347,699                                 | 1,600,882,369                                     |
| Agency Services        | 72             | 749            | 575                                       | 1,210                                    | 40                        | 241                                     | 9,116                                       | 12003   |
|                        | 98,922,139     | 145,382,012    | 121,902,241                               | 3,235,132,043                            | 8,630,010                 | 29,142,645                              | 1,578,861,518                               | 5,217,972,927                                     |
| Asset Management       | 90             | 203            | 315                                       | 1,281                                    | 38                        | 241                                     | 4,670                                       | 6838  |
|                        | 227,632,060    | 72,570,551     | 158,123,983                               | 2,290,082,550                            | 50,038,882                | 35,092,369                              | 1,568,696,090                               | 4,400,286,493                                     |
| Retail Brokerage       | 887            | 511            | 2,652                                     | 11,682                                   | 39                        | 161                                     | 4,496                                       | 20428   |
|                        | 404,552,140    | 74,433,686     | 995,217,387                               | 4,184,548,472                            | 10,819,472                | 17,347,297                              | 648,575,461                                 | 6,335,493,916                                     |
| Private Banking        | 257            | 1,076          | 509                                       | 4,175                                    | 52                        | 182                                     | 5,071                                       | 11322   |
|                        | 428,501,503    | 395,668,975    | 98,393,103                                | 2,487,942,214                            | 5,135,532                 | 13,534,885                              | 645,778,821                                 | 4,044,955,013                                     |
| Corporate Items        | 86             | 425            | 2,741                                     | 915                                      | 330                       | 206                                     | 1,567                                       | 6270  |
|                        | 299,929,406    | 40,274,573     | 475,482,092                               | 1,629,754,162                            | 206,336,028               | 45,974,521                              | 1,037,626,696                               | 3,735,349,479                                     |
| Total Number of Losses | 9,586          | 86,651         | 30,672                                    | 48,353                                   | 4,077                     | 6,014                                   | 103,872                                     | 289225  |
| Total Amount of Losses | 6,039,002,852  | 13,973,038,233 | 4,949,426,465                             | 73,789,794,849                           | 1,400,410,468             | 2,575,640,237                           | 33,452,037,404                              | 155,179,350,508                                   |

This data was generated using the 2012 Q4 ORX Global Data Set, which contains losses up to the end of 2012 Q3 (Most recent date of recognition) 30th September 2012

To date, ORX has gathered nearly 30,000 events that have cost their consortium members over €100 billion euros. The cost of operational risk is abundantly clear. This table shows that ORX business line data is dominated by Retail Banking events, both in size of losses and frequency of events.

To further understand the relative impact to the different businesses and from the different risk categories, it is helpful to take another look at this data in percentage format as shown in Table 5.

**Table 5: The Percentage Contribution to Number of Events and Amount of Losses by Business Line and Risk Category**

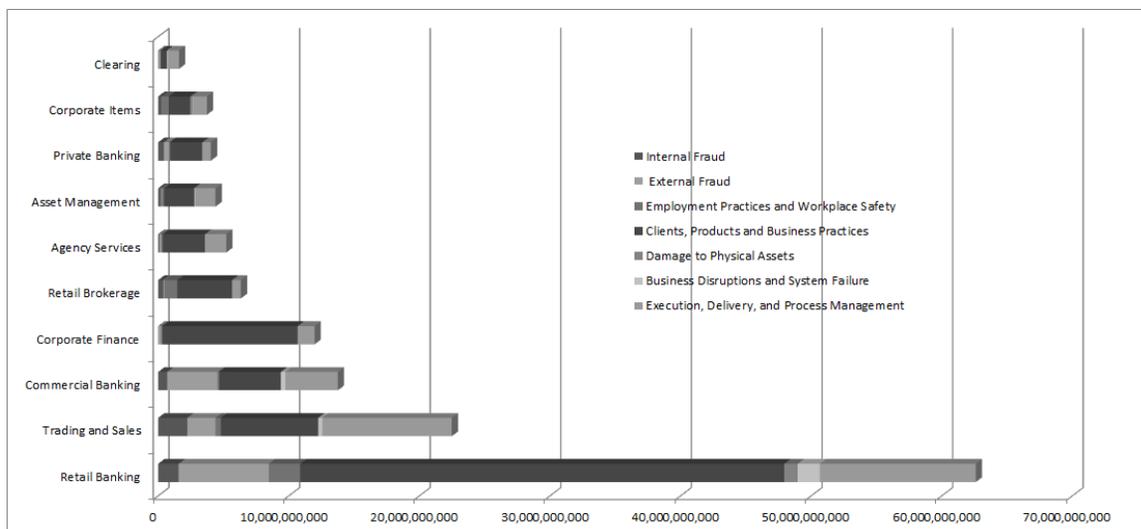
|                        | Internal Fraud | External Fraud | Employment Practices and Workplace | Clients, Products and Business | Damage to Physical Assets | Business Disruptions and System Failure | Execution, Delivery, and Process Management | Total of Number of Losses, Total |
|------------------------|----------------|----------------|------------------------------------|--------------------------------|---------------------------|---|---|----------------------------------|
| Corporate Finance      | 0.0%<br>0.0%   | 0.1%<br>0.1%   | 0.1%<br>0.1%                       | 0.2%<br>7.6%                   | 0.1%<br>0.0%              | 0.0%<br>0.0%                            | 0.4%<br>0.9%                                | 0.9%<br>8.8%                     |
| Trading and Sales      | 0.1%<br>1.6%   | 0.1%<br>1.6%   | 0.4%<br>0.3%                       | 0.7%<br>5.5%                   | 0.1%<br>0.0%              | 0.6%<br>0.2%                            | 8.1%<br>7.3%                                | 10.0%<br>16.5%                   |
| Retail Banking         | 2.5%<br>1.2%   | 25.1%<br>5.1%  | 7.3%<br>1.8%                       | 7.2%<br>27.2%                  | 1.0%<br>0.8%              | 0.7%<br>1.3%                            | 14.1%<br>8.8%                               | 57.9%<br>46.0%                   |
| Commercial Banking     | 0.2%<br>0.5%   | 3.2%<br>2.8%   | 0.4%<br>0.1%                       | 1.9%<br>3.4%                   | 0.1%<br>0.0%              | 0.2%<br>0.2%                            | 3.8%<br>3.0%                                | 9.8%<br>10.1%                    |
| Clearing               | 0.0%<br>0.0%   | 0.4%<br>0.1%   | 0.0%<br>0.0%                       | 0.1%<br>0.3%                   | 0.0%<br>0.0%              | 0.2%<br>0.1%                            | 0.9%<br>0.6%                                | 1.7%<br>1.2%                     |
| Agency Services        | 0.0%<br>0.1%   | 0.3%<br>0.1%   | 0.2%<br>0.1%                       | 0.4%<br>2.4%                   | 0.0%<br>0.0%              | 0.1%<br>0.0%                            | 3.2%<br>1.2%                                | 4.2%<br>3.8%                     |
| Asset Management       | 0.0%<br>0.2%   | 0.1%<br>0.1%   | 0.1%<br>0.1%                       | 0.4%<br>1.7%                   | 0.0%<br>0.0%              | 0.1%<br>0.0%                            | 1.6%<br>1.2%                                | 2.4%<br>3.2%                     |
| Retail Brokerage       | 0.3%<br>0.3%   | 0.2%<br>0.1%   | 0.9%<br>0.7%                       | 4.0%<br>3.1%                   | 0.0%<br>0.0%              | 0.1%<br>0.0%                            | 1.6%<br>0.5%                                | 7.1%<br>4.7%                     |
| Private Banking        | 0.1%<br>0.3%   | 0.4%<br>0.3%   | 0.2%<br>0.1%                       | 1.4%<br>1.8%                   | 0.0%<br>0.0%              | 0.1%<br>0.0%                            | 1.8%<br>0.5%                                | 3.9%<br>3.0%                     |
| Corporate Items        | 0.0%<br>0.2%   | 0.1%<br>0.0%   | 0.9%<br>0.3%                       | 0.3%<br>1.2%                   | 0.1%<br>0.2%              | 0.1%<br>0.0%                            | 0.5%<br>0.8%                                | 2.2%<br>2.7%                     |
| Total Number of Losses | 3.3%           | 30.0%          | 10.6%                              | 16.7%                          | 1.4%                      | 2.1%                                    | 35.9%                                       | 100.0%                           |
| Total Amount of Losses | 4.4%           | 10.3%          | 3.6%                               | 54.2%                          | 1.0%                      | 1.9%                                    | 24.6%                                       | 100.0%                           |

These data were generated using the Q4 2012 ORX Global Data Set, which contains losses up to the end of Q3 2012 (most recent date of recognition), September 30, 2012

From Table 5 we can see that nearly 58 percent of the total number of events is generated in the Retail Banking business area and most of those are in the External Fraud category. Trading and Sales and Commercial Banking are the next business lines, with about 10 percent of the total number of events each. Retail Banking also has a lion's share of the total costs of events, with 46 percent of the total losses. Trading and Sales has over 16 percent of losses, and Commercial Banking and Corporate Finance follow with 10 percent and 9 percent.

It is clear that External Fraud and Execution, Delivery, and Process Management produce the greatest number of events in a risk category, accounting for nearly 36 percent of the number of events and 25 percent of the total costs.

Clients, Products, and Business Practices accounts for about 17 percent of the events, but carries more than 50 percent of the total loss amount. This demonstrates that for the member banks of ORX, Clients, Products, and Business Practices events tend to be larger events. It is for this reason that many firms carefully investigate this category in scenario analysis to attempt to identify potential "fat tail" events—that is, events that are infrequent but very large. The data can also be used to visually represent the relative levels of operational risk in each business line, as shown in Figure 6.



**Figure 6: Dollar Value Losses to Date, by Risk Category for All Business Lines**

Figure 6 clearly illustrates the relatively high levels of operational risk that exist today in the Retail Banking sector.

### **Comparisons between Subscription and Consortium Databases**

The differences in collection method and scope have an interesting impact on the relative distribution of the losses between ORX and FIRST data. ORX data shows significantly different patterns to those in the FIRST database.

#### **Size of Losses by Risk Category**

If we compare the data in FIRST and in ORX we can see strong differences between the two data sets. First, let us compare the size of losses in the two sources.

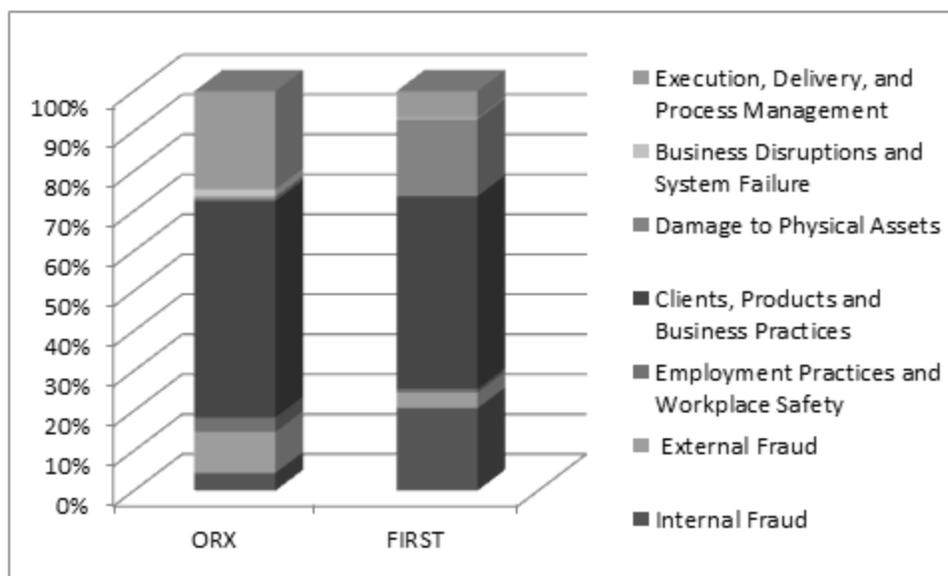


Figure 7: Percentage of Dollar Value Losses to Date in ORX and First Databases, by Event Category, for All Business Lines<sup>21</sup>

As can be seen in Figure 7, the FIRST database contains a significantly higher percentage of losses being attributed to Internal Fraud cases than is indicated in the ORX data. In contrast, the ORX data shows a significantly higher percentage of Execution, Delivery, and Process Management (EDPM) losses than is indicated in the FIRST data. This may be explained by the fact that not all EDPM events are reported in the press, so many of those events would not appear in the FIRST database. This is an unavoidable collection bias that impacts FIRST's data.

However, these EDPM events are included in the ORX data as it is supplied directly from the member banks. Alternatively, this difference might be driven by a difference in the scope of firms that are covered in the two databases. ORX membership is limited, with not all banks participating and so ORX also suffer from a collection bias.

In contrast, FIRST collects data on all firms, including a significant number of firms that are outside of Basel II, and that are not BIS business lines, for example, insurance companies.

### Frequency of Losses by Risk Category

A comparison of the relative frequency of events in the two databases is also interesting and is illustrated in Figure 8.

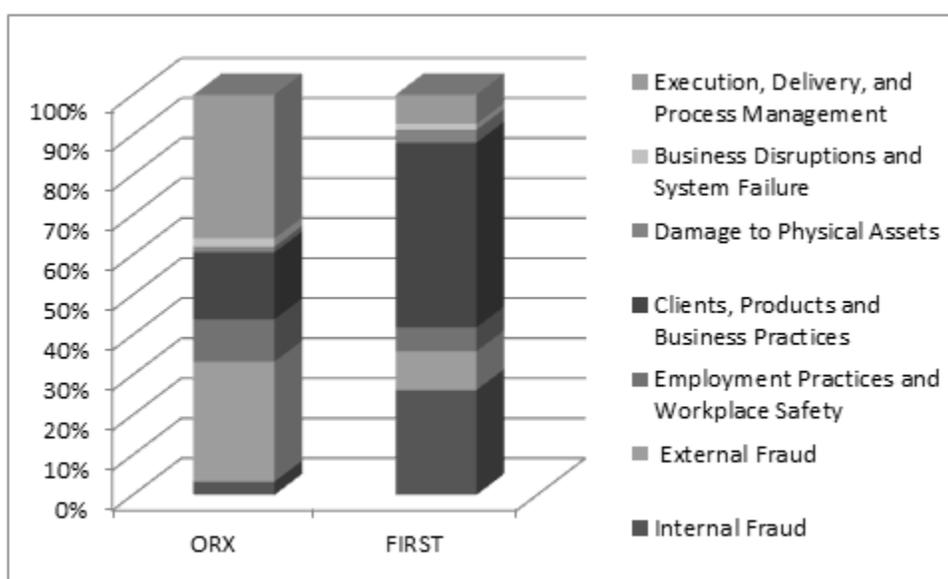


Figure 8: Percentage of Number of Events to Date in ORX and FIRST Databases, by Event Category, for All Business Lines<sup>22</sup>

It is clear from Figure 8 that EDPM events rarely result in public press coverage, and so are missing from the FIRST data. ORX also has larger number of External Fraud events than FIRST, suggesting that External Events are often successfully kept out of the press. The ORX underlying data show that the dominance of External Fraud events occurs mostly due to the participation of retail banks in the consortium. (Most, if not all, ORX members had a retail banking division for the period covered by the report). Retail Banking includes

credit card services, and so it may be that this dominance by the External Fraud category is driven by many relatively small credit card and retail banking frauds. The threshold for loss data delivery to ORX is €20,000, so “small” losses are obviously only relatively small when compared to the very large frauds that are covered in the media.

### Size of Losses by Business Line

When comparing the relative role of the different business lines, there is also a marked difference in the ORX and FIRST data when comparing the size of losses. For Figures 9 and 10 the ORX data has been mapped<sup>23</sup> into equivalent BIS lines to allow for a comparison with FIRST data. Similarly, all non-BIS business line data have been removed from the FIRST data.

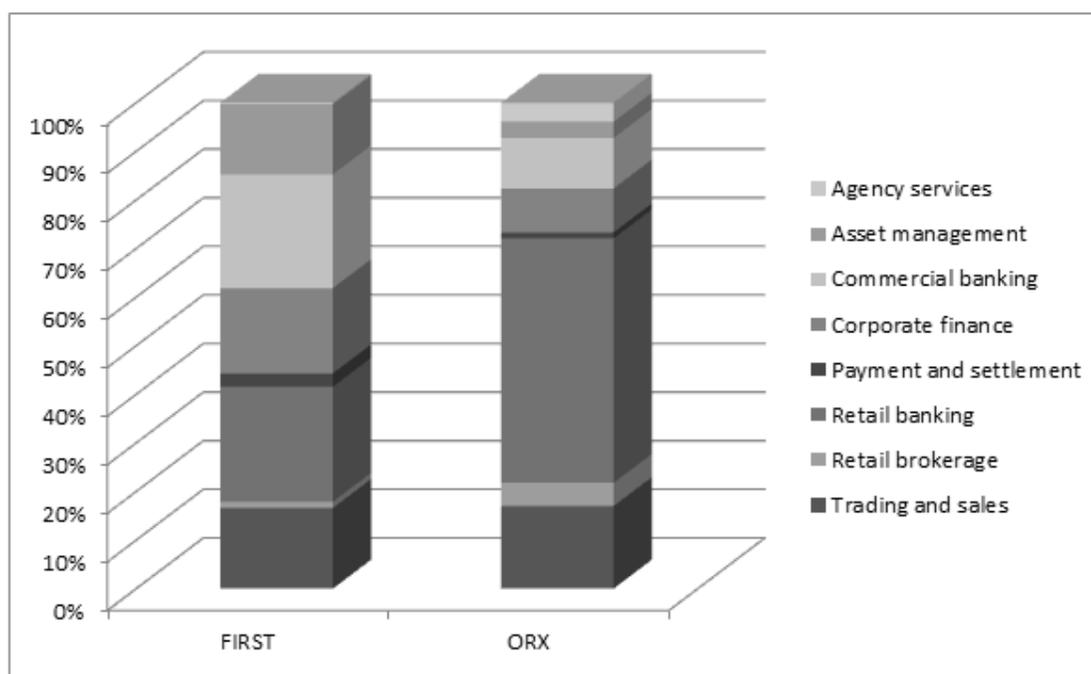


Figure 9: Percentage of Value of Losses to Date in ORX and FIRST Databases, by BIS Business Lines<sup>24</sup>

It is clear from this chart that while FIRST's loss amounts are dominated by Commercial Banking and then Retail Banking, in ORX the loss amounts are more heavily weighted to the Retail Banking business line. In the ORX database, Commercial Banking accounts for a smaller percentage of the financial value of the losses. This is probably a reflection of the fact that recent commercial banking events have made it into the press, and so into FIRST's data, while those firms might not be members of ORX.

ORX has an additional category "Corporate Items," which it does not map to a Basel business line. Events in this category are corporate-level events such as the kidnapping of the CEO or fines for group-level financial misreporting.

### **Number of Events by Business Line**

Similarly, the number of events in the two databases can be compared (see Figure 10).

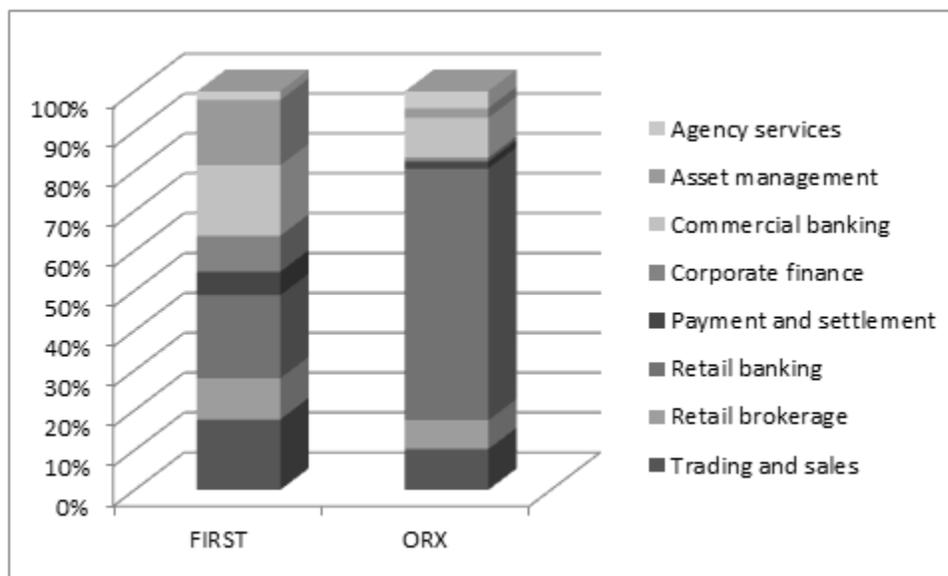


Figure 10: Percentage of Number of Events to Date in ORX and FIRST Databases, by Business Lines<sup>25</sup>

This chart dramatically demonstrates how the ORX data is driven by Retail Banking events, whereas the FIRST data has events more evenly distributed among the business lines. The majority of events occur in Retail in the ORX data. Retail Banking also has the majority in the FIRST database, but at a much slimmer margin.

### Challenges of External Data

Many OR functions use ORX or FIRST or other provider data and then supplement these with their own research by subscribing to online news feeds and relevant industry journals.

However, it is clear from the data set comparisons above that these data must be used with caution. There are several challenges with external data.

First, if the external data are gathered from news sources, then they are subject to a bias in reporting. Only events that are interesting to the

press are reported in the press, resulting in a bias in favor of illegal and dramatic events over errors. For example, a large fraud will receive intensive coverage, while a major systems outage might not make it into any press report. It is also unlikely that a major gain will make the press in the same way that a major loss would, although the same lessons could be learned in both cases.

Second, it can be difficult to determine whether an event is relevant. The fact that a firm has the same business line does not mean it could have the same event occur, as it may have a different product or a stronger (or weaker) control environment. Indeed, many external events might be ignored simply because they “could not happen here” for one or many reasons. However, external data are not best used to try to spot an exact event that should be avoided, but rather to determine the types of errors and control failings that can occur so as to avoid similar (rather than identical) losses.

Third, the use of benchmarked data relies on the quality of the underlying data, and there may be a chance that the comparisons made are not accurate due to a different interpretation of the underlying definitions.

However, if all of these challenges are acknowledged, then external data have a very valuable role to play in operational risk management. It provides insight into lessons that can be learned, prior to an event’s occurring at the firm. It demonstrates that the size of an event may be beyond the initial estimation made by the firm. It provides context and highlights trends in the industry. Internal and external operational risk events provide a rich source of data on what has already gone wrong. It is possible to use these data to implement

mitigating controls to prevent future repetitions of the same events. Moreover, operational risk event data provide a valuable input into the other elements of the operational risk framework that will be designed to predict potential events that have not yet occurred.

Loss data provides useful examples for risk and control self-assessment and scenario analysis discussions and analysis, as well as key risk indicators (KRIs) that can indicate trends of losses and control weaknesses.

### **Impact to Share Value**

One of the major drivers for strong operational risk management is not the direct costs of the event that has occurred, but rather the negative impact on share value.

### **The LIBOR Scandal**

An operational risk event, where the cause is attributed to the internal actions of a bank often gives rise high levels of reputational damage. The LIBOR scandals of 2012 and 2013 tarnished the reputations of many banks. It was alleged that several major banks had manipulated the LIBOR rate over an extended period, in order to benefit financially from the altered rate. The brush was quickly used to also tarnish other benchmark rates globally and regulators from many nations became engaged in uncovering the breadth and depth of the bad behavior.

Headlines from this period show the reputational wounds that were inflicted on those involved, above and beyond the direct OR losses that they suffered in direct fines.

**Rigged Rates, Rigged Markets**

Marcus Agius, the chairman of Barclays, resigned on Monday, saying “the buck stops with me.” His was the first departure since the British bank agreed last week to pay \$450 million to settle findings that, from 2005 to 2009, it had tried to rig benchmark interest rates to benefit its own bottom line. (Rosenthal, 2012)

**RBS Managers Condoned Libor Manipulation**

Royal Bank of Scotland Group Plc managers condoned and participated in the manipulation of global interest rates. (Bloomberg, 2012)

**UBS and LIBOR**

Horribly rotten, comically stupid. (J.R., 2012)

As a result of its role in the alleged LIBOR manipulation, Barclays paid out \$450 million in a settlement with the British and United States regulators and lost its chief executive officer, Robert E. Diamond Jr.; its chairman, Marcus Agius; and its chief operating officer, Jerry del Missier, along with many other key senior managers.

It then suffered a ratings hit as both Standard and Poor’s (S&P) and Moody’s rating agencies placed the firm on negative watch:

The abrupt changes alarmed the ratings agencies. Standard & Poor’s said in its statement that “the negative outlook reflects our view of the current management flux and near-term strategic uncertainty” (Scott, 2012).

In a separate statement, Moody’s said: “The senior resignations at the bank and the consequent uncertainty surrounding the firm’s direction are negative for bondholders” (Scott, 2012).

In addition, Barclays, along with many other alleged participants, at the time of writing was facing multiple lawsuits from firms and individuals who allege that the LIBOR manipulation impacted them adversely.

### **Charles Schwab Sues Banks Over Rate Manipulation**

Charles Schwab is seeking unspecified compensatory and punitive damages from the banks. Other defendants include foreign banks like Barclays, Credit Suisse, Deutsche Bank, HSBC Holdings, Royal Bank of Scotland, Lloyds, WestLB and UBS. - NY Times (Roose, 2011)

### **Banks Rigged Libor To Inflate Adjustable-Rate Mortgages: Lawsuit**

Homeowners in the U.S. are suing some of the world's biggest banks for fraud—not over any foreclosure issues but over the alleged Libor manipulation scam that they say sparked increases on their adjustable rate mortgages, and resulted in unlawful profits for the banks. - Forbes (Touryalai, 2012)

Finally, the threat of fines and lawsuits across the industry pushed stock prices down.

### **Barclays Libor Fine Sends Stocks Lower as Probes Widen**

Barclays Plc (BARC)'s record \$451 million fines for interest rate manipulation sent bank shares plunging as U.S. and U.K. authorities pursue sanctions in a global investigation of more than a dozen lenders. - Bloomberg (Gallu, Brush, & Fortado, 2012)

The scandal eventually spread to other banks involved in LIBOR, and at the time of writing, the New York and Connecticut attorneys general had 16 banks under investigation on this issue: Bank of America, Bank of Tokyo Mitsubishi UFJ, Barclays, Citigroup, Credit Suisse, Deutsche Bank, HSBC, JPMorgan Chase, Lloyds Banking Group, Norinchukin Bank, Rabobank, Royal Bank of Canada, Royal Bank of Scotland, Société Générale, UBS, and West LB. In December 2012, UBS agreed to settle with regulators for a huge \$1.5 billion in total fines.

All of these banks faced the same reputational damage above and beyond the regulatory dollar fines that they were likely to pay. They faced loss of

key personnel (who might also face jail time), credit downgrading, litigation, and stock price devaluation.

A reputational risk event therefore results in multiple impacts occurring, some of which are captured in a Basel II Pillar 1 framework, but some might not be. Fines and litigation are captured in an operational framework as they meet the definition of operational risk:

Operational risk is defined as the risk of loss resulting from inadequate or failed processes, people and systems or from external events. This definition includes legal risk, but excludes strategic and reputational risk. (Basel Committee for Banking Supervision, 2004)

Stock price losses, credit downgrades, and loss of key personnel are not generally considered financial losses within this definition, and reputational risk is expressly excluded. However, this does not mean these risks should remain unmanaged or unmitigated.

As we saw earlier, the banking sector as a whole took a major stock hit as a result of the widespread LIBOR scandal. Barclays themselves saw an 18 percent slide during the early stages of the news breaking.

In 2004 Cummins, Lewis and Wei studied the market value impact of operational loss announcements by US banks and insurance companies. They concluded that equity values respond negatively to operational loss announcements (Cummins, Lewis, & Wei, 2004).

In 2005, Perry and de Fontnouvelle completed a study on the market reaction to operational risk announcements. They examined the difference between internal fraud events and other events, on the assumption

that internal fraud events carry a much higher reputational impact than, for example, execution errors.

They concluded that: “market values fall one-for-one with losses caused by external events” (de Fontnouvelle & Perry, 2005) indicating the significant impact of operational risk events on share value. Furthermore they found that “market values fall...by over twice the loss percentage in cases involving internal fraud.” suggesting operational risk is even more costly where there is associated reputational impact.

A similar study was conducted in 2010 by Gillet, Hubner, and Plunus. The authors examined 154 events coming from the FIRST database Events occurred between 1990 and 2004 in companies belonging to the financial sector and that are listed on the major European and US Stock Exchanges. The authors analyzed stock market reactions to the announcement of operational losses by financial companies, and also attempted to disentangle operational losses from reputational damage. Their results showed:

... significant, negative abnormal returns at the announcement date of the loss, along with an increase in the volumes of trade. In cases of internal fraud, the loss in market value is greater than the operational loss amount announced, which is interpreted as a sign of reputational damage. (Gillet, Hübner, & Plunus, 2010)

The impact of an operational risk event on stock price can be seen in the recent JPMorgan ‘Whale’ operational risk event.

### **JP Morgan Whale’s Impact on Stock Price<sup>26</sup>**

In May 2012, JPMorgan announced that it had lost \$2 billion (eventually much more), on a hedging strategy that was being driven by Bruno Michel Iksil, aka “The London Whale” in its chief investment office.

The headlines were witty and the event dominated the news for months:

“London Whale Harpooned” - Forbes (Vardi, 2012)

“JPMorgan’s ‘Whale’ Causes a Splash” - Financial Times (Schäfer & Makan, 2012)

“Beached London Whale” (Yahoo, 2012)

Both the Wall Street Journal<sup>27</sup> and Bloomberg<sup>28</sup> raised concerns about the size of Iksil’s trades earlier in April and hedge funds quickly responded and set about taking the other side of his trades, betting that the Whale’s position was outsized and unmanageable. Jamie Dimon, CEO and chairman of JPMorgan, made comments that he certainly now regrets, calling the concerns raised “a complete tempest in a teapot.”<sup>29</sup> Jamie Dimon later admitted,

“In hindsight, the new strategy was flawed, complex, poorly reviewed, poorly executed, and poorly monitored. The portfolio has proven to be riskier, more volatile, and less effective as an economic hedge than we thought.” (WSJ Blog, 2012)

It became apparent that JPMorgan’s own risk management tools were not working effectively, as Dimon added:

“We are also amending a disclosure in the first quarter press release about CIO’s VaR, value at risk. We’d shown average VaR at 67. It will now be 129.”<sup>30</sup>

VaR, or value at risk, is the strongest tool in the risk manager’s arsenal, providing an indication of the actual current risk taking of the firm

measured against its expected levels of risk taking. JP Morgan shut down the trading strategy four days after the news hit the press in April.

The SEC swiftly opened a review (NY Post, 2012) into the accounting practices used by JPMorgan and the Justice Department opened a criminal inquiry<sup>31</sup> into the whole affair. Lawsuits<sup>32</sup> also sprung up among disgruntled JPMorgan shareholders.

This was a massive operational risk event. JPMorgan released two reports of the event in January, 2102, one by an internal task force (Task Force Report, 2013), and the other conducted independently by the board (JP Morgan Board, 2013). In the task force report, they were transparent about their operational risk failings, as summarized by Bloomberg:

In a 129-page report issued yesterday, the bank described an “error prone” risk-modeling system that required employees to cut and paste electronic data to a spreadsheet. Workers inadvertently used the sum of two numbers instead of the average in calculating volatility. The firm also reiterated an assertion that London traders initially tried to hide losses that ballooned beyond \$6.2 billion in last year’s first nine months. (JP Morgan Halves Dimon Pay, 2013)

The share value impact of this event can be clearly seen in Figure 10. In the first 11 painful days after the event, JPM stock went from 40.64 to 32.51 and only recovered a little when all banks stocks got a boost on news of good U.S. home sales. The data in Figure 11 was derived by comparing news headlines with trade volume and share price data retrieved from Bloomberg and shown in Table 6.

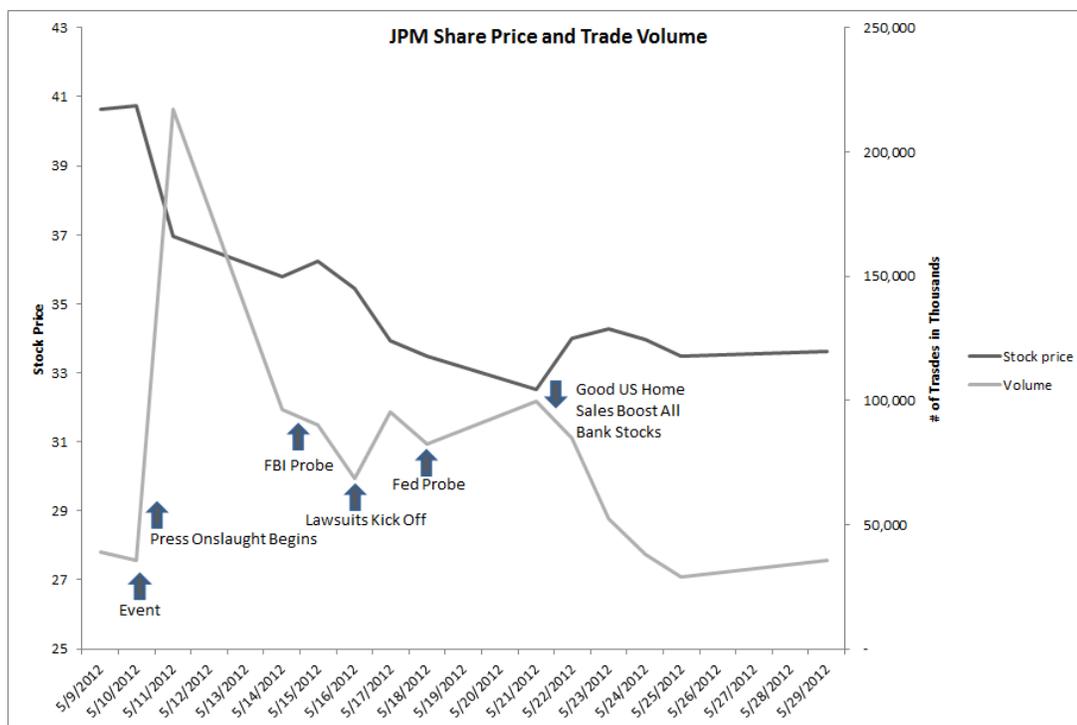


Figure 11: Whale Event's Impact on JP Morgan Stock Price and Trading Volume<sup>33</sup>

Table 6: JPM price and trade volume

| Date      | JPM Price | Trade Volume |
|-----------|-----------|--------------|
| 5/9/2012  | 40.64     | 28,769,900   |
| 5/10/2012 | 40.74     | 35,827,100   |
| 5/11/2012 | 36.96     | 217,294,208  |
| 5/14/2012 | 35.79     | 96,488,496   |
| 5/15/2012 | 36.24     | 89,903,696   |
| 5/16/2012 | 35.46     | 68,729,600   |
| 5/17/2012 | 33.93     | 95,429,200   |
| 5/18/2012 | 33.49     | 82,650,096   |
| 5/21/2012 | 32.51     | 99,554,800   |
| 5/22/2012 | 34.01     | 84,721,000   |
| 5/23/2012 | 34.26     | 52,512,900   |
| 5/24/2012 | 33.97     | 37,843,300   |
| 5/25/2012 | 33.5      | 28,796,400   |
| 5/29/2012 | 33.63     | 35,855,200   |

The cost of operational risk is clearly established, both in actual losses as recorded in FIRST and ORX and in the share value impact that events have on the firms that suffer those losses.

Chapter 4 proposes an operational risk framework that provides a firm with the tools needed to avoid losses, avoid share price impact and meet the Basel II regulatory requirement for operational risk management and measurement.

## Chapter 4: Proposed Operational Risk Framework

### Overview of the Operational Risk Framework

As discussed in Chapter 1, an operational risk program should ensure that operational risk is identified, assessed, monitored, controlled and mitigated. The Basel Committee on Banking Supervision's 2011 "Sound Practices for the Management and Supervision of Operational Risk" (Risk Management Group of the Basel Committee on Banking Supervision, 2011) provides helpful guidelines for best practices for operational risk departments. When meeting these standards, an operational risk framework needs to be developed that will fit with the culture of the bank and reflect best practice in the industry.

The main data building blocks of an operational risk framework are:

- Loss data collection
- Risk and control self-assessment
- Scenario analysis
- Key risk indicators

The framework must also address governance, provide policies and procedures, drive culture change, and respond to and inform risk appetite. In addition, the framework should feed data into any capital modeling and should feed data and analysis into risk reporting.

Figure 12 illustrates a possible framework that includes all of these elements.

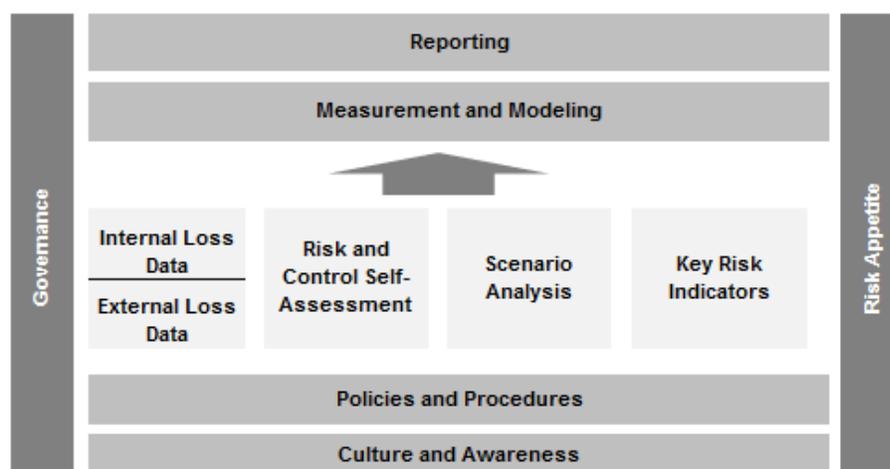


Figure 12: Proposed Operational Risk Framework

Each element is important, but the timing of implementation and the relative weight of each element in the framework, will vary depending on the culture of the bank and its regulatory and business drivers.

### The Foundations of the Framework

There are two elements that drive the design and acceptance of the operational risk framework as a whole, and it is important to start with these.

These two elements are governance and culture and awareness.

#### Governance

Governance determines the roles and responsibilities of the head of the operational risk function and her team that manages the framework, the committees that oversee and make key decisions about risk management, the operational risk managers in lines of business, and every employee who may encounter operational risk.

In order to develop an operational risk framework that is effective, an appropriate governance structure must be carefully considered at the outset. Governance should also be revisited at least annually, to check whether it is still working as intended. Good governance enables the escalation of risk and ensures that risk transparency is effective through all of the layers of operational risk management that may exist.

Governance holds the whole operational risk framework together, including who should own the operational risk functions, and what the operational risk functions should own.

### **Culture and Awareness**

Once governance has been addressed, the next step in developing an operational risk framework is to proactively tackle culture and awareness. While it may be tempting to jump into developing the building blocks of operational risk management, such as loss data collection and risk and control self-assessment, those building blocks will only be successful if sufficient time and energy has been spent on culture and awareness.

The implementation of a successful operational risk framework requires winning over the hearts and minds of the employees of the firm. Spotting operational risks is a developed skill. While the risks exist in all lines of business, it takes the right tone at the top, training and awareness to identify the risks. Operational risk can arise in any corner of the firm and can result in best practice responses, or may be met with indifference. The response will depend on the work that has been done in the area of culture and awareness. It is necessary to

look at various aspects of this essential activity, including training, marketing, and building a brand for the operational risk function.

### **Policies and Procedures**

The next foundational element of the framework is policies and procedures. There was a time, not that long ago, when banks and financial institutions did not take their policy and procedure programs very seriously. Today, that has changed dramatically under the watchful eye of the regulators. Firms are expected to have clear, actionable, and measurable policies and procedures.

Indeed, there is a trend in financial services to pay closer attention to writing and actively managing policies and procedures. A well-managed policy framework gives lines of business increased flexibility because the rules of the road are not ambiguous. Having well-managed policies and procedures gives a financial firm a head start and increased autonomy when interacting with regulators. A good operational risk framework will have well documented policies and procedures that reflect the requirements of each of the elements.

### **The Four Data Building Blocks**

With governance, culture and awareness, and policy and procedures holding the framework together, we can now turn to the four main pieces of work that are needed in order to have an effective operational risk framework: loss data collection, risk and control self-assessment, scenario analysis, and key risk indicators.

## **Loss Data Collection**

There are two types of loss data that are key to the framework: internal loss data, which occurs within the firm, and external loss data, which occurs outside the firm.

### **Internal Loss Data**

Operational risk management and measurement require access to data on events that have already occurred in the firm, and in the industry and loss data collection is the first of four activities that form the heart of an operational risk framework. The firm's own data is referred to as internal loss data, while industry data is referred to as external loss data.

Developing an effective set of internal loss data is often the first major task faced when building out an operational risk framework. Basel II requires a firm to have at least three years of internal loss data in order to pursue an advanced measurement approach. Therefore, loss data collection needs to be quickly established, and carefully implemented to ensure good quality data is in place.

If loss data collection is started before appropriate governance is established and before culture and awareness have been addressed, then the data collected is likely to be lower quality.

### **External Loss Data**

Operational risk events that have occurred in the industry (but outside the firm) are very important in understanding the operational risk faced by

the firm. Therefore, the collection and analysis of external loss data is a key element in an effective loss data program.

There are regulatory requirements regarding the use of external data in an advanced measurement approach, but the lessons learned from peers are valuable beyond those requirements. External data help inform risk and control self-assessment and scenario analysis and are often an important component in effective reporting.

### **Risk and Control Self-Assessment**

The second of the four main building blocks of operational risk management activity is risk and control self-assessment (RCSA). Risks and controls are identified and assessed through RCSA, with a view to controlling and mitigating any unacceptable risks.

While loss data tells us what has already happened, RCSA is designed to help us to understand what risks we face today. Loss data are backward looking, but RCSA looks at risk levels now.

The RCSA might be the most important part of the framework because it addresses the requirements that we first looked at in Chapter 1. Those requirements are that the operational risk framework should identify, assess, control, and mitigate risk.

While loss data allow us to identify and assess risks that have occurred and to consider how to control and mitigate those risks in the future, RCSA allows us to identify all risks, not just those that have already materialized. Loss data is about hindsight. Risk and control self-assessment is about foresight.

## **Scenario Analysis**

The third activity in the framework is scenario analysis. Unlike risk and control self-assessment, scenario analysis is only looking for rare, catastrophic risks. It is focused on identifying plausible risks that are so large as to be potentially fatal or severely destructive to a firm.

Scenario analysis stresses the operational risk framework and pushes participants to think outside their comfort zone. RCSA centers on discussions of the risks that are faced and the controls that are in place, whereas scenario analysis requires participants to consider what could happen if there is a serious failure of controls or a previously unassessed combination of risks.

Scenario analysis is a challenging area, and many firms struggle with meeting the regulatory requirements while retaining business value in the process.

## **Key Risk Indicators**

The final building block of operational risk data gathering is key risk indicators. Operational risk practitioners sometimes use the terms key risk indicator and metric interchangeably; however, they are quite different. Metrics provide an important monitoring function across the framework and they can be attached to loss data and to risks or controls in risk and control self-assessment and can provide useful input to scenario analysis. Metrics also provide information for the business environment internal control factors that are required for an advanced measurement approach.

A key risk indicator predicts that a risk is changing and would allow for proactive intervention. It is difficult to find metrics that are true key risk indicators or can be combined to form a key risk indicator, because many metrics are simply counting exceptions or measuring performance, rather than measuring an increase or decrease in risk levels.

### **Measurement and Modeling**

Once the four data-gathering building blocks of loss data, risk and control self-assessment, scenario analysis and key risk indicators are in place, then operational risk can be measured and modeled.

An advanced measurement approach capital calculation requires the following four elements: internal loss data, external loss data, scenario analysis, and business environment internal control factors. The latter can be gathered from risk and control self-assessment and from key risk indicators.

### **Reporting**

All of the above elements feed into operational risk reporting. Without effective reporting, the operational risk framework is a factory that is busy making data widgets that are not used. Reporting gathers all of the information that has been collected and analyzed in the loss data program, the RCSA program, the scenario analysis program, the metrics program, and the capital modeling program and puts it to use.

The quality of reporting is critical to the success of an operational risk framework. Reporting that leaves its audience asking “so what?” is of little value. Reporting that asks its audience to think or say or do something is of great

value. It is essential to provide reporting that is not data gathering, but instead provides risk analysis and risk transparency and that leads to better business decision making.

### **Risk Appetite**

Finally, the whole framework is held together by risk appetite. It is difficult, but not impossible, to express a risk appetite for operational risk. It often takes time for an operational risk framework to mature to the stage where risk appetite can be effectively discussed and agreed upon.

While governance is the first pillar or support for the framework, risk appetite is its partner. Effective governance requires a clear articulation of risk appetite, and risk appetite can be set only when strong governance is in place.

### **Conclusion**

The effective identification, assessment, monitoring and mitigation of operational risk is vital to the financial health of the financial services industry. The cost of direct losses and the impact of operational risk events on share value is clearly established. Therefore, a robust operational risk management and measurement framework should be embedded in all large financial institutions. The proposed framework attempts to address Basel II regulatory requirements, the Sound Practices recommendations, the US Federal Reserve and OCC rules and the risk management needs of senior management.

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<sup>1</sup> Footnote 90, (Basel Committee for Banking Supervision, 2004).

<sup>2</sup> S644, (Basel Committee for Banking Supervision, 2004).

<sup>3</sup> Annex 9, (Basel Committee for Banking Supervision, 2004).

<sup>4</sup> "About BIS"

<sup>5</sup> Central bank and lead financial regulatory representatives from France, Germany, Italy, Japan, the Netherlands, Sweden, Switzerland, the United Kingdom, the United States, and Luxembourg.

<sup>6</sup> Argentina, Australia, Belgium, Brazil, Canada, China, France, Germany, Hong Kong SAR, India, Indonesia, Italy, Japan, Korea, Luxembourg, Mexico, Netherlands, Russia, Saudi Arabia, Singapore, South Africa, Spain, Sweden, Switzerland, Turkey, United Kingdom, United States. (Fact Sheet—Basel Committee on Banking Supervision)

<sup>7</sup> (Basel Committee for Banking Supervision, 1988)

<sup>8</sup> (Basel Committee for Banking Supervision, 2004), p.144.

<sup>9</sup> (Basel Committee for Banking Supervision, 2004) p.204.

<sup>10</sup> Comprising (European Community, 2006) and (European Community, 2006)

<sup>11</sup> Sourced from online loss data service provider and reproduced with permission of Reproduced with permission of IBM® Algo FIRST®.

<sup>12</sup> Investigatory report published on February 20, 2008, by Société Générale (Société Générale, 2008)

<sup>13</sup> Updated report published May 20, 2008

<sup>14</sup> Sourced from online loss data service provider and reproduced with permission of IBM® Algo FIRST®.

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<sup>17</sup> SAS also has a subscription database available.

<sup>18</sup> Source: IBM® Algo FIRST® for Web Edition on Cloud, Q4 2012.

<sup>19</sup> IBM® Algo FIRST®, 2012, 4th Quarter Overview, nonoperational risk categories removed.

<sup>20</sup> See note 34.

<sup>21</sup> Sources: ORX Report, 2012 and FIRST Database, 2012 - 4th Quarter Overview, nonoperational risk categories removed.

<sup>22</sup> Sources: ORX Report, Q4 2012 and FIRST Database, Q4 2012.

<sup>23</sup> Clearing has been renamed Payment and Settlement, and Private Banking has been included in Retail Banking and items mapped to corporate items have been removed.

<sup>24</sup> Sources: ORX Report, Q4 2012, and FIRST Database, Q4 2012.

<sup>25</sup> Sources: ORX Report, Q4 2012, and FIRST Database, Q4 2012.

<sup>26</sup> Extract from blog posted by Philippa Girling at [www.pwgassociates.com](http://www.pwgassociates.com), reproduced with permission.

<sup>27</sup> (Deal Journal, 2012)

<sup>28</sup> (Ruhle, 2012)

<sup>29</sup> Reported by Reuters: (Reuters, 2012)

<sup>30</sup> A full transcript of the call is available at (JP Morgan, 2012)

<sup>31</sup> As reported in the Wall Street Journal (Wall Street Journal, 2012)

<sup>32</sup> As reported in Time (Gustin, 2012)

## RESUME

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### BIO SUMMARY AND KEY SKILLS

- Global Operational Risk Manager
- Attorney: Banking & Financial Services
- Eighteen years' experience in global financial services industry.
- Recognized industry expert on operational risk and regulatory developments.
- Experienced in operational risk, information security, business continuity, risk and insurance, new product approval and law.
- Experienced in strategic and operational business transformation providing extensive support, structure, motivation and business process reengineering techniques
- Twenty years' experience in project management. Advanced in the tools of project management and the processes involved in the successful completion of a project.
- Experienced in Basel II regulatory requirements and recent global regulatory developments
- Goal-oriented, profit driven, pragmatic and conscientious, a natural communicator with passion and enthusiasm in business transformation and change.
- Team skills, calmness and confidence in presentation and negotiation at all levels, able to establish and maintain good business relationships at all levels and across different cultures. Natural motivator and mentor.
- Enterprising, focused and flexible business style with rapid acquisition of new scenarios.
- In all a strong communicator and leader with absolute integrity and high standards of business ethics.

### SELECTED ACHIEVEMENTS

- Global Head of Operational Risk and Business Chief Risk Officer for Global Financial Services Firms.
- Established new Operational Risk Department for three major international financial institutions.
- Built new banking and financial services legal practice for established law firm.
- Authored two Operational Risk textbooks.
- Frequent public speaker on Operational and Regulatory Risk.
- Adjunct professor in Masters level and Executive Management Operational Risk courses for Columbia Business School, University of Connecticut, Rutgers University and London Business School.
- Holder of NY Bar and Financial Risk Manager (FRM) qualifications.
- Successfully led project management consultancy firm for 5 years, specializing in strategic and operational project management consulting to the financial services industry
- Successfully designed and implemented two large training organizations and a global in house training program.
- Leader in the industry: chair of SIFMA Operational Risk Committee, Chair of Data Issues sub-group of AMAG, member of NY Steering Committee and Ethics Committee of PRMIA, Board Member of committee of Women's Bond Club of NY.
- Recognized in 2009 by Op Risk and Compliance magazine as one of the decade's "Top Fifty Faces of Operational Risk".

## **WORK EXPERIENCE**

### **CAPITAL ONE COMMERCIAL BANK**

#### **Business Chief Risk Officer**

**1/2013 - current**

- Head of Commercial Banking Business Risk Office
- Leading teams for business continuity management, information security, third party risk management, operational risk management, compliance control monitoring, audit management, regulatory exam management to meet Basel II requirements and business non-credit risk management needs.

### **MORGAN STANLEY**

#### **Acting Global Head of Firmwide Operational Risk**

**9/2011 – 8/2012**

- Responsible for governance, policy and oversight for Operational Risk.
- Lead PMO for Basel OR PMO.
- Managed team of 35.
- Responsible for OR regulatory exams and internal audits.
- Responsible for quarterly reporting cycle to Firm Risk Committee and Board.
- Responsible for independent assessment of operational risk exposure in all business units.
- Responsible for validation of effectiveness of OR framework and alignment of model and management.

#### **Global Chief Operating Officer, FHC Governance and Assurance**

**4/2010 – 9/2011**

Department of 200 people including Operational Risk, Business Continuity Management, Information Security, Insurance, Environmental Risk, New Product Approval, Policy Office and Financial Holding Company Program Management.

- Manage strategic planning and \$75m budget process for department.
- Established and managed departmental PMO, including coordinating regulatory and audit responses
- Managed departmental administration and operations.
- Established departmental brand.
- Responsible for identifying and leading strategic cross-departmental initiatives, including metrics, issue and action tracking, and multiple assessments, leading to an integrated technology solution.
- Sponsored and managed integrated IT initiative, including vendor assessment, RFP process and proof of concept.
- Sponsored and managed firm wide risk and control taxonomy project.
- Responsible for identifying and implementing coverage integration activities across the department.
- Established and managed communication, networking, training and development activities across the department
- Lead role in regulatory exams and audits

### **GARRITY, GRAHAM, MURPHY, GAROFALO & FLINN P.C. Of Counsel**

**6/2008 – 4/2010**

- Headed a new banking and financial services group within the law firm.
- Responsible for the development and management of a legal services practice specializing in banking and financial services sector

- Provided management consulting in operational, strategic and geopolitical risk management

**NOMURA HOLDING AMERICA, NY**  
**Global Co-Head of Operational Risk Management**

**4/2006 – 6/2008**

Established new Firm-Wide Operational Risk department including:

- Recruited teams in NY and London
- Designed and developed global strategic plan for Operational Risk and developed and managed implementation plan for new Operational Risk Framework including:
  - Basel II AMA compliance; Governance; Culture and awareness; Policy and procedures; Loss data collection; Risk and control self assessment; Scenario analysis; Key risk indicators; Reporting
- Managed new product approval process
- Managed RFP and vendor selection process for global OR system
- Designed and implemented scenario analysis and facilitated workshops
- Developed pilot capital model based on scenario analysis
- Designed and lead training and facilitation sessions

**MORGAN STANLEY**  
**Program Director, Firm Operational Risk Dept**

**5/2003 – 4/2006**

Established new Firm-wide Operational Risk department including:

- Recruited full team
- Established workstreams for RCSA, Loss Data, Reporting, Technology and Measurement
- Managed strategic development and structure of department
- Planned for Basel II SEC CSE and London FSA regulatory compliance
- Developed coverage model
- Coverage lead for Finance, Law and Compliance Divisions
- Managed department budget and coordination of department activity
- Managed OR communications throughout firm
- Lead on RCA workstream, including designing and leading RCA workshops
- Developed and delivered OR training across the firm
- Participated in industry working groups and events as representative for Morgan Stanley

**COO, Firm Financial Control Group**

Provided structure, direction and facilitation for intra-divisional activities including:

- Developed and managed operational risk framework for Finance Division
- Established and managed Basel II PMO for Financial Control Group Division
- Designed and delivered IT project prioritization strategy
- Designed and managed 'people agenda' communications, including new website and newsletter for 2000 employees
- Coordinated senior management meetings and deliverables

**CAO, Retail Financial Control Group**

Provided structure, direction and facilitation for Retail FCG activities including:

- Developed and managed project management framework for Finance Division
- Coordinated integration and SOX project activities
- Coordinated senior management meetings and deliverables

**CREDIT SUISSE GROUP, Zurich, Switzerland: Senior Project Advisor,** **6/2001 – 2/2002**

Provided strategic consulting to the global IT advisory group on Knowledge Management. Liaised with senior IT executives globally.

**PHILIPPA EVANS ASSOCIATES, NY: President/Senior Consultant, 3/1996 – 5/2001**

Placed self at Morgan Stanley and Credit Suisse. Placed others as project management and project analyst consultants in financial services placements. Grew revenue to \$850,000.

Personal assignments included:

**Senior Project Advisor, Morgan Stanley, NY 10/1997 - 12/2000**

- Balanced Scorecard: Senior Project Advisor to the Balanced Scorecard Project in MSDW Institutional Securities Infrastructure. Participated in strategic development of scorecard.
- Y2k: Senior Project Advisor responsible for the development of effective reporting package for the integration testing and event management phases of the Y2k project.
- Facilitation: provided strategic and planning meeting facilitation
- Project Office Design: responsible for the research and development of appropriate project management tools for Operations globally.
- Project Resource Management: responsible for the design of effective Operations Program Office reporting to alert Operations to potential human resource red flags.
- End User Training: responsible for the design and implementation of an effective End User Computing training program that would facilitate organizational change in the Operations department worldwide.

**Consultant, Credit Suisse, Zurich/Switzerland 3/1996 - 6/1996**

- Responsible for project to develop new international training strategy for a mainframe banking application.

**CITYMAX LTD, (subs of Credit Suisse), London, UK: Head of Training, 3/1995 - 3/1996**

- Responsible for project managing the launch and marketing of a new external IT training services division. Implemented internal project management training program. Team leader responsible for selection, development and management of members of successful team.

**SOUTH BANK UNIVERSITY, London, UK: Head of Training, 3/1993 - 3/1995**

- Responsible for a two year project: launching, managing and internally marketing the organization's new technology training and development program and facilities. Successfully managed training of over 2000 university staff and delivery of over 200 courses within two years. Personally delivered over 30 different training courses.

**EUROPEAN SEMINARY OF BUSINESS AND LAW, Northampton, UK: Director 9/1991 - 10/1992**

- Director, responsible for the development and delivery of training in pan-European business methods and strategies.

**MACABILITY, Singapore: Director 10/1989 - 7/1991**

- Consultant in Singapore, project managing and programming software solutions and providing training for the business and education sectors.

## **EDUCATION**

| <b>Dates</b> | <b>Qualification</b>   |
|--------------|--|
| 2/2007       | Financial Risk Manager (FRM)   |
| 11/2004      | New York Bar   |
| 6/1995       | Post Graduate Diploma in International Business<br>South Bank University, London, UK |
| 6/1987       | LLB (Hons) Law Degree<br>University of East Anglia, London, UK                       |

**AFFILIATIONS**

Member of Global Association of Risk Professionals (GARP)  
Member of Professional Risk Manager International Association (PRMIA)  
Member of New York City Bar  
Member of American Bar Association (ABA)  
Board Member of Women's Bond Club  
Chair of SIFMA Committee on Operational Risk  
Chair of AMAG Sub-Group on Data Issues