

## ENTERPRISE RISK MANAGEMENT

## MODERN OPERATIONAL RISK MANAGEMENT

The recent wave of extraordinary losses in financial services suggests that it's time for a new approach to managing risk, particularly operational risk.

By Ali Samad-Khan

Operational risk is perhaps the most significant risk organizations face. Virtually every major loss that has taken place during the past 20 years, from Enron, Worldcom and Baring's Bank to the unauthorized trading incident at Société Générale and the subprime credit crisis, has been driven by operational failure.

Many financial institutions have spent tens of millions of dollars trying to develop a robust framework for measuring and managing operational risk. Yet, in spite of this huge investment, for many firms developing a viable operational risk management (ORM) program remains an elusive goal.

Why is this so? A lot has to do with the way organizations have approached this problem and the underlying assumptions they have made. Many financial firms believe that operational risk is not a material risk. This can be seen in the low capital charge allocated to this risk relative to other risks (e.g., 15% to 20% of total economic/regulatory capital). Many view operational risk as just back-office operations risk, and executives generally believe that ORM is fundamentally about managing control weaknesses in the processes at a tactical level. These views have largely shaped funding and staffing decisions, which have in turn affected resource allocation and methodology development.

The recent wave of losses in the financial services industry is causing many senior executives to rethink their overall approach to risk management. Many now realize that operational risk is a much more important

risk than it was originally thought to be. As a result, some are considering a new approach to managing this type of risk. One such approach is modern ORM.

### WHAT IS OPERATIONAL RISK?

Operational risk, broadly speaking, is the risk of loss from an operational failure. Operational risk permeates all aspects of the risk universe — that is to say it overlaps with and exacerbates all other types of risks, such as market, credit, liquidity and underwriting risk. In fact, in the absence of operational failure, the other risks are much less significant.

However, when the banking industry was confronted with this “boundary issue” many years ago, the Basel Committee ruled that credit losses driven by operational failure were to be treated as credit losses for capital adequacy purposes. This compromise ruling, which was based on historical precedence and expedience, had the unintended effect of diminishing the importance of operational risk — not just in banking but across all industries that followed suit.

Under this narrow definition, operational risk was associated with a low capital charge; therefore, many banks viewed it as a low-priority issue. Not only did this divert resources and management attention away from this key risk, but it also obscured the underlying causes of many of the largest losses.

Operational risk is much more than just operations risk. Operations risk is a subset of operational risk and is characterized by

unconscious execution errors and processing failures. Because these risks are generally well known, they also tend to be well managed. In addition, because these events stem from “normal” operational failures, the consequential single-event losses are relatively small — rarely in excess of a million dollars. Operational risk, by contrast, is driven primarily by “non-normal” operational failures, particularly conscious violations of professional or moral standards and excessive risk taking. Examples include sales practice violations and unauthorized trading activities. Ironically, many multibillion-dollar losses occur when the perpetrators *nomi-*  
*nally* intend to benefit their respective firms, but do things that are not in their best long-term interests.

### TRADITIONAL AND MODERN ORM — DIFFERENT BUSINESS PROBLEMS

There are two general approaches to ORM — traditional and modern. The following examples illustrate the key differences.

*The traditional ORM problem:* If you are walking along the train tracks, and there is a train approaching at 100 mph, what do you do? You identify the risk: death by train crash. You assess the risk: Likelihood = 90%; impact = \$10 million (a person's value to society). So you estimate the risk at \$9 million. Since you do not want to accept this risk, you develop an appropriate action plan: Jump off the tracks.

The traditional ORM problem relates to an imminent threat, which requires a tactical solution.

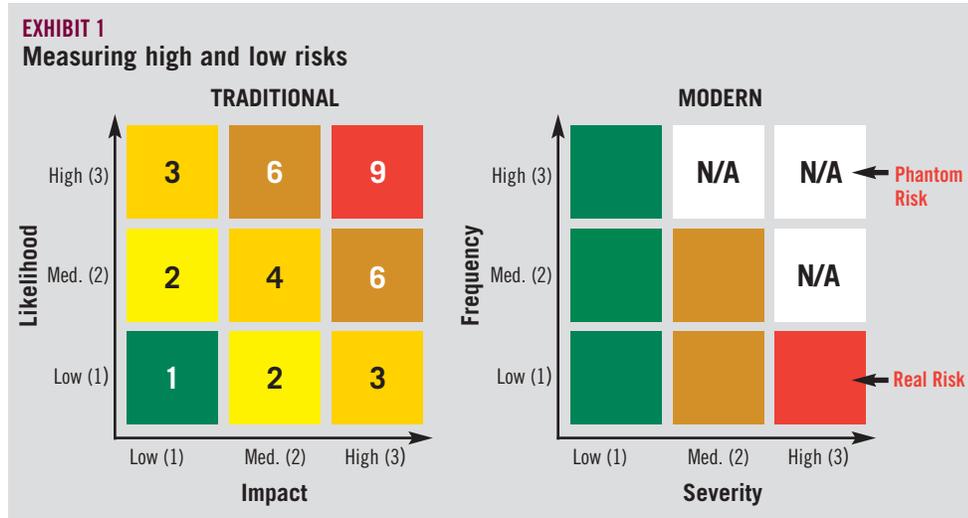


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*The modern ORM problem:* After you jump off the tracks, you ask how much risk is there to society from train accidents, and are the controls in place optimal in the context of society's risk/loss tolerance? To answer these questions, you need to know how many people are actually killed each year on average (the expected loss) and in the worst year in the past 10 years (a crude measure of the risk).

To simplify this problem, let us optimize only the risk-control relationship (not the risk-reward relationship) and only with respect to the expected loss (this is actually loss tolerance, not risk tolerance). Suppose 10 people are currently killed on average each year. Also suppose it costs \$5 million to build a fence around the train tracks, and you expect that will bring down the death rate to two per year (benefit = \$80 million). And finally, suppose it costs \$10 billion to build a tunnel around the tracks and that will bring down the death rate to .01 per year (benefit = \$99 million). Using the modern ORM approach, comprehensive cost-benefit analysis reveals that the optimal solution is to build a fence around the tracks and tolerate an average loss of two deaths per year.

Traditional ORM is used to make tactical decisions. This is important, but traditional methods cannot help you address strategic issues, such as optimizing the risk-control relationship in the context of your risk/loss tolerance. Modern ORM is designed to help senior executives make strategic business decisions. This requires an altogether different framework — one based on data, models and circumspect analysis. In a



modern ORM framework, risk measurement and risk management go hand in hand.

### PROBLEMS WITH TRADITIONAL METHODS FOR STRATEGIC RISK MANAGEMENT

For most organizations, the centerpiece of their ORM framework is traditional risk and control self-assessment. Under a traditional ORM approach, high risk is characterized as high likelihood and high impact. In fact, high risk should be represented as low frequency and high severity, consistent with the treatment of risk for market, credit and underwriting risk, for example. Under the traditional approach, a minor risk, such as high probability (but moderately large) transaction processing errors, would be described as high risk, whereas low-frequency (but high-severity) unauthorized trading losses, such as the recent \$7.2 billion unauthorized trading loss at Société Générale, would be characterized as relatively low risk (see *Exhibit 1*).

Because traditional risk and control assessment is the key element in most organizations' ORM programs, by following this approach, many institutions may have focused attention on the right operational issues but the wrong operational risk issues. As a result, they may have become overcontrolled in the areas where they have the least risk and undercontrolled in the areas where they have the most risk. Managing operations is very different from managing operational risk.

Another practical concern with the traditional approach is that it begins with a "risk identification" process. This concept — figuring out where your risks are — sounds intuitively appealing and can be useful when it is used to identify a few key imminent threats. However, this approach is very challenging to implement when the goal is to systematically identify all the risks an organization faces. Because risks overlap, it is possible for a conscientious

tious practitioner to identify thousands of risks. Needless to say, it is very difficult to actively manage such a full array of risks. Consequently, most of these risks are never acted upon.

From an analytical perspective, another drawback of the traditional approach is that it represents potential operational failures as if they could have only one possible outcome. In fact, operational failures can have a wide range of outcomes, i.e., a distribution of outcomes where each potential outcome has a corresponding probability (see *Exhibit 2*). Conducting likelihood and impact analysis essentially means picking one point on the curve.

### THE MODERN APPROACH TO ORM

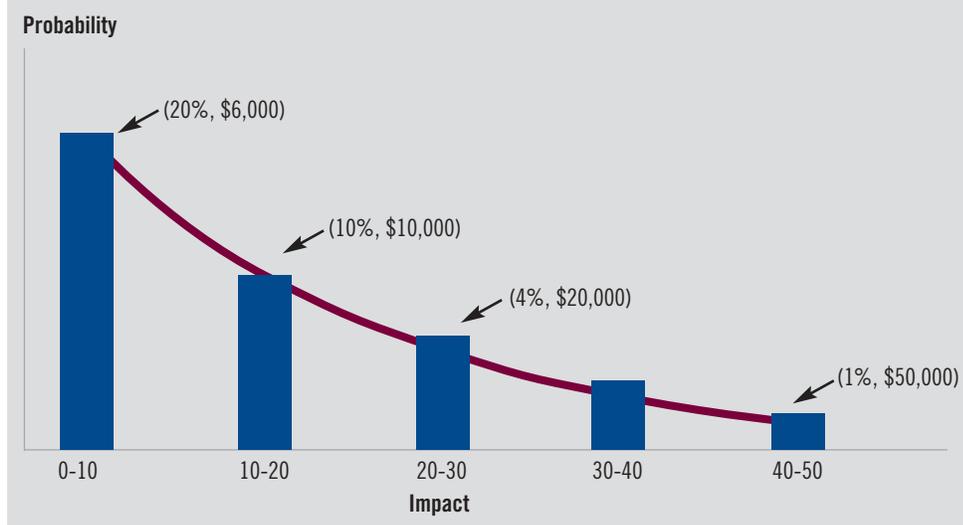
Modern ORM is not just about measurement. It is about developing a robust and systematic process for incorporating risk-reward and risk-control information into business decisions. Specifically, it is a process for making business decisions where the level of risk to be assumed net of controls is aligned with the risk and loss tolerance standards of the stakeholders.

#### Risk Measurement

The centerpiece of the modern ORM framework is historical loss data and an actuarial loss model. Under this approach, data are transformed into loss frequency and severity distributions to measure the expected and unexpected loss of a risk class for a specified time horizon such as one year. *Exhibit 3* illustrates this process.

Using a modern ORM framework, it is possible to manage an entire portfolio of risks using an “organizational unit-risk

**EXHIBIT 2**  
Measuring distributions of risk outcomes



class” matrix. This means determining which businesses to invest in based on their risk-reward relationship and which risk mitigation strategies to employ by optimizing the risk-reward and risk-control relationship across the full spectrum of exposures.

Where good data exist, the shape of the distribution can be driven by historical loss experience, which reflects the quality of the existing control environment. Risk level and control quality can be measured for each cell of the organizational unit-risk class matrix. Comparing changes in the expected loss (the mean) and the unexpected loss (the risk) over time provides a way of validating the impact of improvements in controls.

Because of the paucity of internal loss data and biases in external loss data, modeling operational risk is a daunting task. Traditional actuarial methods alone are not sufficient. New scientific methods have been developed to address these problems, but many organizations are not yet at the point of implementing these methods.

Most organizations that model operational risk do so only to calculate economic or regulatory capital. Where this is the primary objective, there is an incentive to choose

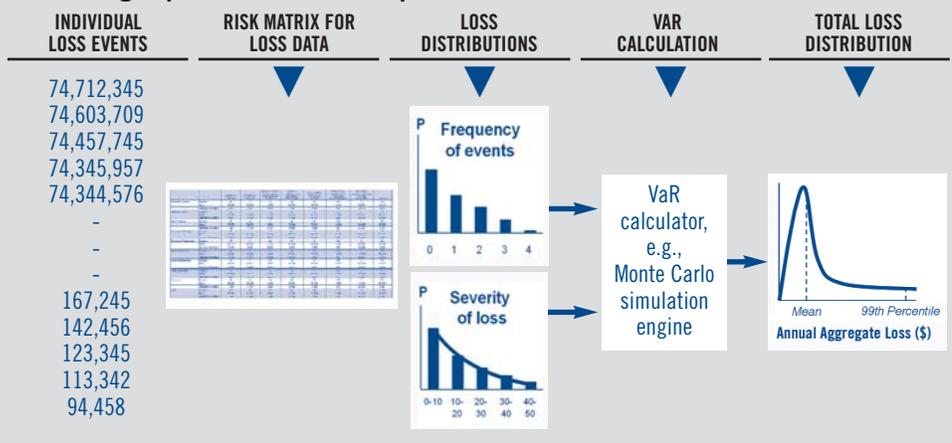
methods or assumptions that produce results that are likely to be deemed acceptable, rather than methods that reflect the full magnitude of this risk. In such an environment, some methods that are not robust may still be acceptable. There is presently a large gap between common practices and best practices in operational risk modeling.

#### Taxonomy

One reason that operational risk is so hard to manage is that it is not easy to develop a workable classification scheme, or taxonomy, for this type of risk. In order to manage operational risk through a structured process, it is important to have a mutually exclusive and exhaustive list of risk categories. What makes this such a challenging process is that every operational failure has three dimensions: contributory factors, events and consequences (see *Exhibit 4*). Modern ORM is based on this multidimensional framework, centering on the event dimension as the starting point for analysis.

Contributory factors and events comprise causes. Unauthorized sales practices (an event) represent an inherent exposure. This type of event will take place when an employee decides to commit such an act. Lack of management supervision (a con-

**EXHIBIT 3**  
Calculating expected loss and unexpected loss



**IMPLEMENTING MODERN ORM**

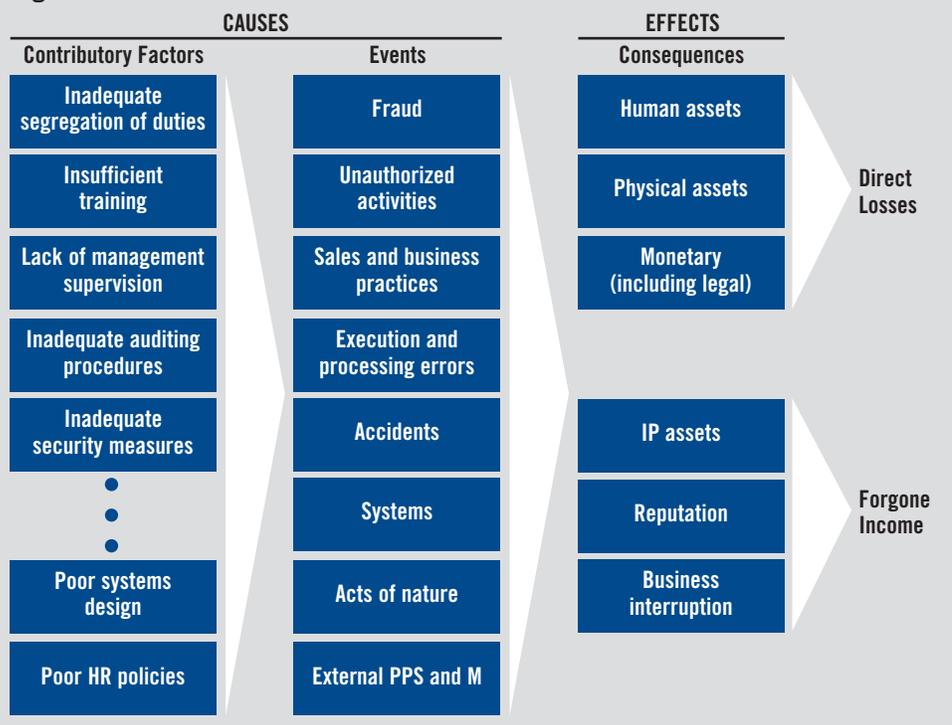
Many organizations view ORM only as a series of independent tasks, such as identifying control weaknesses, developing action plans, or collecting loss data and calculating capital figures. In effect, these activities represent some combination of Sarbanes-Oxley and Basel II compliance. Firms have invested huge sums of money implementing these silo-based programs. Disappointed by their lack of success, many have erroneously concluded that ORM is a meaningless compliance exercise.

However, ORM should not be viewed as a set of disjointed tasks. Instead, it should be thought of as a structured process for making more educated risk management decisions, where relevant risk and control information is integrated in a common framework. Such an approach is referred to as modern ORM. Modern ORM uses actuarial science as its foundation: a method for calculating expected loss (cost) and unexpected loss (risk), which can be used to optimize risk-reward and risk-control in the context of cost-benefit analysis.

In a modern ORM environment, senior management views operational risk not as an afterthought, but as an integral part of the strategic planning, business management and enterprise risk management processes. Many firms have already recognized the benefits of modern ORM, and it could lead the way in setting a new standard for industry best practices.

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**EXHIBIT 4**  
A generic classification scheme



tributory factor) allows this to take place with greater frequency or severity. The modern framework for loss data classification facilitates better-informed postmortem analysis. By analyzing losses in well-defined categories, rather than individually, it is possible to develop a systematic process for optimizing the trade-offs between risk-reward and risk-control.

**ORM AND RISK-BASED PRICING**

In insurance pricing, the expected loss is accounted for, along with related expenses and a profit margin that, among other things, accounts for variations above the mean — the unexpected loss. It is important to have a sound basis for incorporating the expected loss (cost) and the unexpected loss (risk) of operational failure into product prices, so that the price of all products and services fully reflects the risk-adjusted cost to the organization.