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Measuring and Managing operational risks in financial institutions

Tools, Techniques and Other Resources

CHRISTOPHER MARSHALL

Measuring and Managing OPERATIONAL RISKS IN FINANCIAL INSTITUTIONS

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Christopher Lee Marshall
Singapore, October 2000.

PREFACE

COULD ANY OF THESE HAPPEN TO YOU?

Staff in your financial marketing group are accused of selling some complex new products to "unsuitable" clients. Some of the clients bring a class-action litigation suit charging the bank with negligence. Ten percent of balances are affected with 20 percent restitution. The cost: $3 million.

A major earthquake disrupts part of the bank's data center. The cost: a 10 percent reconstruction cost, $200 million in lost assets, and lower client revenues resulting in a 5 percent reduction in income.

A class-action customer suit charged that a firm's security protection was aimed solely at staff and left customers at risk. The cost: $1 million.

Incorrect historical volatilities are accidentally used to price a new series of OTC options. The cost: $20 million.

The head of the bond desk unexpectedly resigns. Her 15 years with the firm have made her indispensable. It will take at least 6 months to find her replacement. The cost: estimated lost revenue of $5 million.

A competitor adopts a critical new data warehousing technology for direct marketing and reduces costs to gain a competitive advantage. The cost: a 50 percent drop in fee revenue is required to remain competitive.

A lower cost producer cherry-picks the bank's lucrative housing loan market. The cost: a 20-basis point fall in interest margin for 3 to 4 years and 40 percent reduced growth for 2 years.

What three things do all these losses have in common? First, all of these actually happened (although fortunately not to the same firm!). Second, they were all completely unexpected. Third—and most importantly—for all of these events, *the risk of loss can be measured and managed systematically.* Some of the losses could have been prevented. Some could have been made less likely through the redesign of processes and systems or the development of new controls. Other risks could have been passed to outside parties by buying insurance, hedging, or outsourcing. Additional capital could have been set aside.

This process of risk identification, measurement, analysis, and remedial action is the subject of this book—the systematic management of losses that can imperil any financial institution. How we manage these potential losses or risks depends on our identifying, understanding, and analyzing the factors that cause the loss and the possible effects that the loss can have. How bad could it get? How likely is it? Answers to these questions will determine both survival and competence in the new competitive financial markets as high capital requirements—the result of unmanaged risks—lcaden the firm's ability to remain competitive.

Unfortunately, traditional management approaches to operational risk, such as ad hoc controls or systems patches, do more harm than good by contributing to the complexity that lies at the heart of much operational risk. While the finance sector has led the way in developing sophisticated techniques for measuring market and credit risks, it still can learn much from industries such as nuclear engineering and air traffic control, in which the twin constraints of high safety and expensive maintenance have forced leading-edge solutions for operational risk measurement and dynamic resource allocation. Drawing from reliability engineering, quality management, insurance management, and financial-risk management, this new discipline of operational risk management applies both *quantitative* and *qualitative* techniques to help managers efficiently and effectively deal with the ongoing operational issues they face. This book describes these *systematic* techniques for measuring the operational risks associated with system failure or error, transaction processing or control errors, business interruption, criminal acts, and personnel risks, among others. You cannot manage what you cannot measure. Effective risk assessment always precedes effective management. While measurement can only be a means rather than an end in itself, the strengths and limitations of various techniques must be understood if operational risk

management is to enhance, rather than detract from, traditional control and audit systems.

The objective of this book is to develop managers' understanding of the major issues involved in operational risk measurement and management. The book does not specify a single best approach to measuring and managing operational risk exposures. Unlike, say, financial market risks, operational risks are deeply embedded in the contexts of specific businesses, and therefore, simplistic globally prescriptive approaches are inappropriate and potentially damaging. Instead, mangers are encouraged to experiment and develop their own tools and techniques to measure and manage the exposures they face. Consequently, the book takes a contingent view of risk-management tools and techniques, devoting as much time to the circumstances in which a technique is appropriate as to the details of the technique itself.

With these objectives in mind, the book is organized into four major sections, plus two appendices:

Section I: Background. Chapter 1 describes the background to operational risk management, how operations have evolved, and why the markets have become increasingly risk-conscious over time. Chapter 2 explores how practitioners and researchers from a variety of disciplines have developed some basic concepts and techniques for the problem of measuring operational risks. Finally, Chapter 3 provides an overview of different models of operational risks and when they are most appropriate.

Section II: An Operational Risk Management Methodology. Building on Section I, Section II provides a detailed but generic methodology of the entire process of operational risk measurement and analysis. Chapter 4 develops the rationale for operational risk management, while Chapter 5 identifies specific exposures. Chapters 6 and 7 explore the technical issues involved in risk estimation. Finally, Chapter 8 provides guidelines for analyzing the estimated operational risk exposures.

Section III: Risk Management Actions. Section III considers what management can do to prevent, predict, mitigate, and finance the risks uncovered in Section II. In so doing it describes the contingent nature of many commonly, but often inappropriately, used management techniques such as reengineering, insurance, financial hedging, and Total Quality Management (TQM). Understanding the characteristics of operational

risks for which these techniques are appropriate (or not) is argued to be the major determinant of successful risk management. Different chapters in Section III cover different aspects of effective operational interventions, such as risk avoidance and factor management (Chapter 9), loss prediction (Chapter 10), loss prevention (Chapter 11), loss control (Chapter 12), loss reduction (Chapter 13), and risk financing (Chapter 14).

Section IV: Operational Risk Management in Practice. This section describes the issues involved in ongoing operational risk management. Chapter 15 looks at risk monitoring and reporting, while Chapter 16 explores the issues involved in risk-based capital allocation and performance measurement.

Appendices: Appendix A contains a glossary of risk types, with myriad examples and suggestions of some general heuristics to help operational risk managers deal with these risks. Appendix B describes some commonly used commercial packages and services for operational risk measurement and management.

In summary, this book emphasizes that the benefits of a firmwide operational risk management program go far beyond keeping out of next week's headlines. Although operational risk management is not a substitute for competent management, trained and motivated personnel, and well-organized controls and procedures, it *can* be a critical tool for directing resources to problem areas through problem prevention, prediction, mitigation, and financing. Indeed, operational risk management should lie at the heart of any firm's core competence, since it enables continuous and ongoing improvements in the *dynamic* allocation of critical resources such as capital, staff, and management attention. In the early 21st century, firms that fail to continuously monitor and systematically adapt their operations face too daunting a challenge.

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Section I

BACKGROUND

CHAPTER 1

INTRODUCTION

In a recent survey by PricewaterhouseCoopers and the British Bankers Association (BBA), approximately 70 percent of UK banks considered their operational risks as important as their market or credit risks. Nearly a quarter of these banks had experienced operations-related losses of more than $1.6 million (ISDA/BBA/Robert Morris Associates 1999). Historical loss data from Operational Risk, Inc. (ORI) suggests that the financial-services industry may have lost as much as $200 billion from operational disasters over the past 20 years. ORI's records suggest that in over 50 cases, individual institutions lost more than $500 million each, while in over 30 cases, individual firms lost over $1 billion each.

Why have operational risks become such a concern, and why now? To answer this requires understanding the evolving business and technology context within which operational managers must function, how this context has severely stressed traditional financial-services operations, and why management and regulatory responses have been forced to play catch-up.

1.1 EVOLVING FINANCIAL SERVICES

Financial markets, products, and the technology and techniques used to produce them have undergone a sea change over the past 40 years, and the implications for operations are profound. Changes in markets and products and services (on the demand side) and changes in techniques and technologies (on the supply side), have altered the landscape of operations (Figure 1.1) and fueled the explosive development of operational risk management.

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