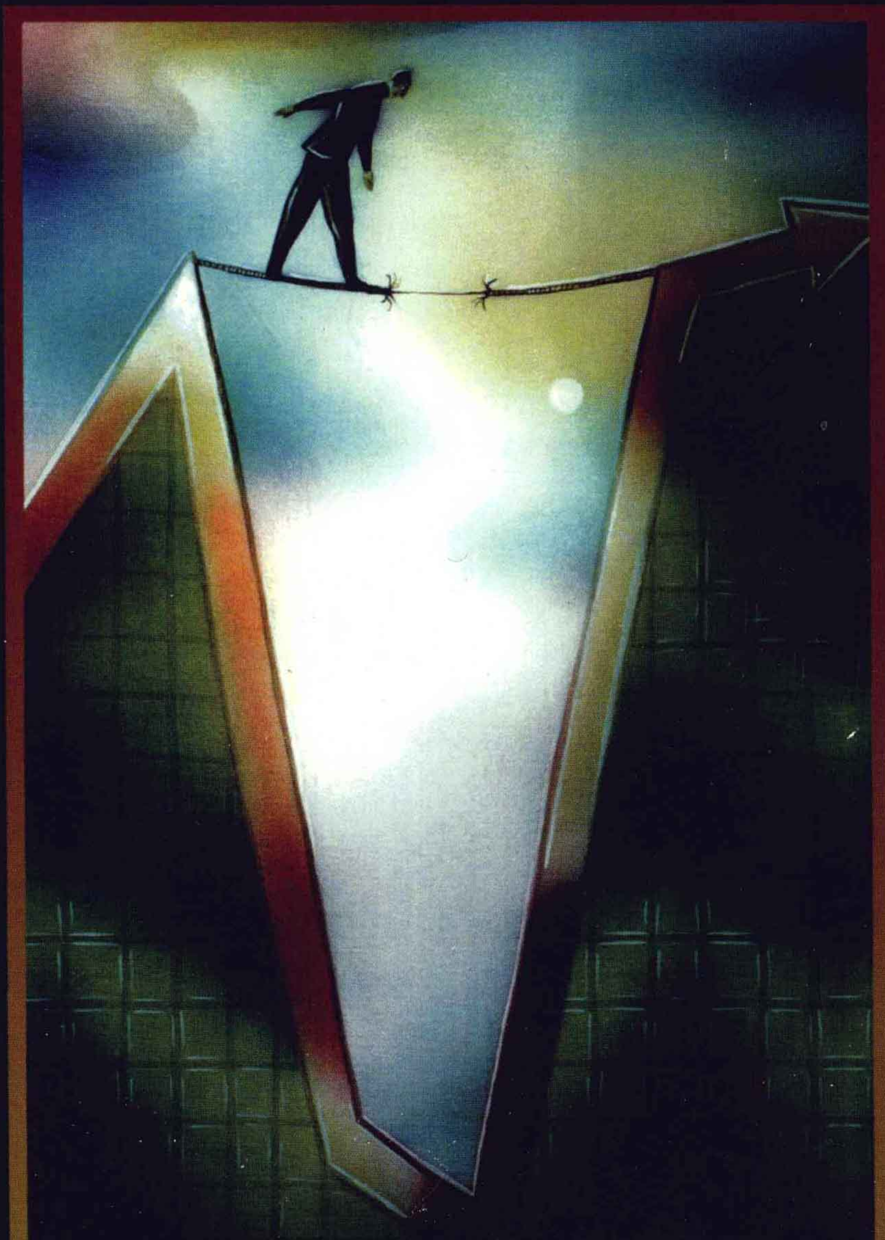
Risk Takers

USES AND ABUSES OF FINANCIAL DERIVATIVES



John Marthinsen

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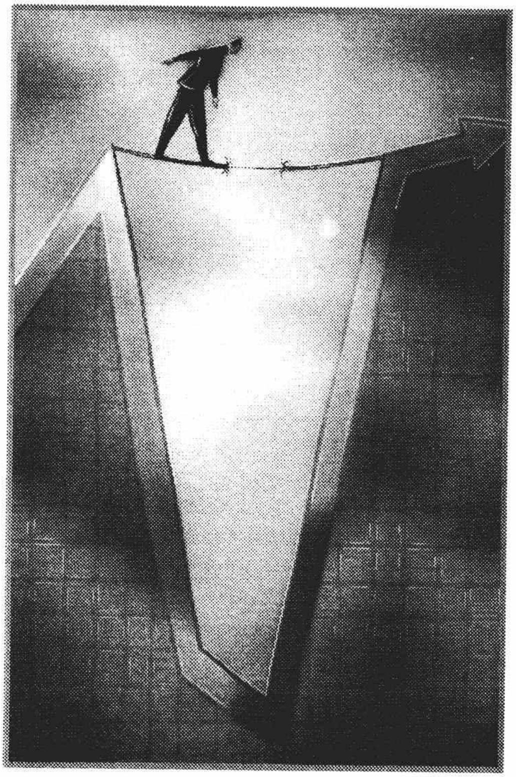

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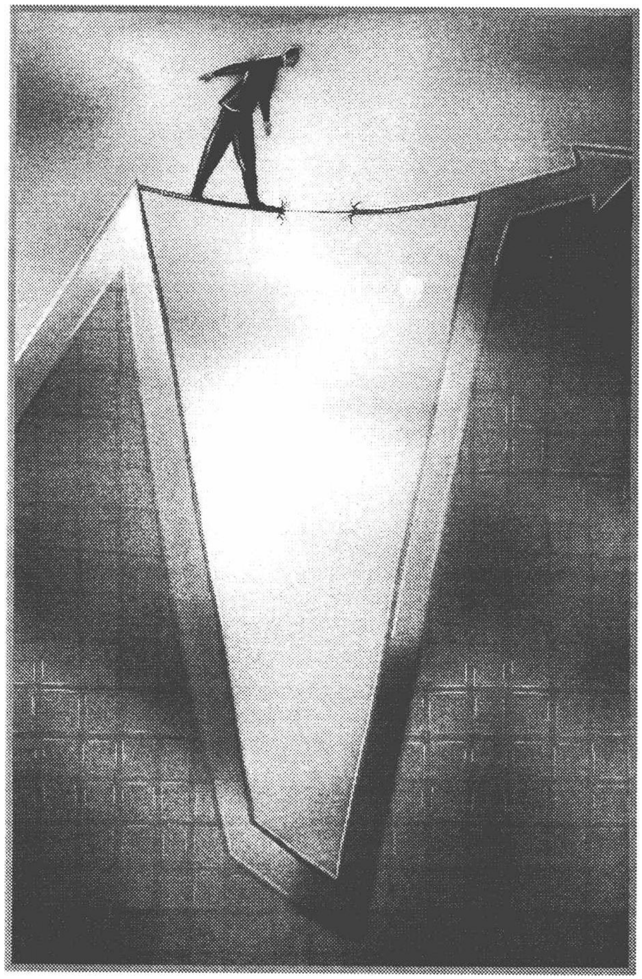

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Preface

INTRODUCTION

Derivative contracts have played a useful role in trade and commerce for thousands of years, and the growth and development of these financial instruments are tributes to the positive effects of business ingenuity and competition. Evidence shows that forward contracts were used as early as 2000 B.C. in trade between India and the Arab Gulf and also in Mesopotamia.[1] In Ancient Greece, around 300 B.C., olive growers used derivative agreements to reduce the price risks associated with future harvests. In the twelfth century, European trade fair merchants negotiated forward contracts for the future delivery of their goods. In seventeenth-century Amsterdam, forwards and options were widely used. During Amsterdam's tulip mania in the 1630s, these contracts not only protected some merchants from dramatic price changes, but also fueled speculative increases in the price of tulip bulbs. Later in the seventeenth century, Japan developed a futures market in rice. Derivative markets as we know them today began in the mid-nineteenth century and progressed rapidly during the twentieth century. Looking back over four thousand years of history, it is clear that, even though the number and types of derivative contracts have changed dramatically, their basic function has remained the same. Derivatives exist to transfer risks from those who do not want to bear it to those who do.

Despite the numerous examples of early derivative use, growth in these markets is often benchmarked relative to the early 1970s, when large fluctuations in exchange rates and interest rates gave rise to the first traded

[1]Edward J. Swan, *Building the Global Market: A 4000-Year History of Derivatives*. London: Kluwer Law International 2000.

contracts in currency futures and interest-rate futures. Since then, the global derivatives markets have blossomed; today, they are truly in a league of their own. The Bank for International Settlements estimates that, as of December 2002, the notional value of global, over-the-counter derivative contracts was approximately $142 trillion—a sum approximately seven times larger than the stock market capitalization of all industrialized nations![2]

Derivatives have proven to be powerful tools in an unstable and turbulent marketplace. These financial instruments have given debtors the ability to reduce their borrowing costs, transfer unwanted risks, and increase financial flexibility. Creditors have been able to increase their risk-adjusted returns, stabilize cash flows, transfer undesired exposures, and focus on the types of risks that they know best. Intermediaries have earned considerable profits and secured valuable lines of business with important customers by identifying and transforming risk-return profiles, discovering arbitrage opportunities, and creating new derivative instruments. Speculators have been provided an active marketplace to trade contracts in their attempts to earn above-average returns. In general, the voluntary market exchange of financial risks has benefited society by improving the allocative efficiency of the national and international financial systems. As a result, derivative instruments have created a bigger pie for everyone to share.

Despite the net benefits of derivative instruments, when left in the wrong hands or unmonitored, they can create losses serious enough to bankrupt even the largest and most established companies and municipalities. Unfortunately, these speculative losses have received the lion's share of media attention, even though they represent the minority of overall transactions. In this book, we will analyze a few of these derivative-related fiascos, and we will find that, in virtually every case, the ill effects could have been avoided or significantly mitigated by a better understanding, communication, and monitoring of derivative risks.

PURPOSE OF THE BOOK

I wrote this book as a practical supplement to the "Risk Management" course that I teach at Babson College in Babson Park, Massachusetts. The book is not intended as a substitute for the rigorous mathematical and empirical material found in the textbooks and articles I assign for the "Risk

[2]Bank for International Settlements. *OTC Derivative Markets Activity in the Second Half of 2002*. 8 May 2003. Available at: http://www.bis.org/press/p030508.htm. Accessed on 9 September 2003.

Management" course. My hope is that readers at all levels of interest in derivatives will find this book interesting and approachable, because it helps bridge the gap between theory and practice.

Based on my experience, there are many excellent analyses of derivatives and risk-management techniques, but they are often difficult, technical, and presume a lot of knowledge of the subject. As a result, their strength in rigor is a weakness in terms of accessibility. It is my hope that the analyses in this book will be accessible to even novice readers of derivatives.

The real-life events chosen for this book provide a contextual framework for understanding and evaluating the potential risks and returns of derivative instruments. The chapters analyze the uses of derivatives (i.e., cases when things went right) and their abuses (i.e., cases when things went wrong), because much can be learned from successes and failures. These are not traditional case studies that provide brief descriptions of situations or problems and then set the stage for group discussions about possible solutions and approaches. Rather, the chapters thoroughly describe the strategies and events that actually affected companies and municipalities faced with derivative-related decisions, and they cover the outcomes, as well. This still leaves plenty to discuss, and I hope readers will continue the conversation and form their own opinions about how to prevent derivative use from turning into abuse.

ORGANIZATION OF THE BOOK

This book is divided into two parts. The three chapters in Part I focus on creative, value-added uses of financial derivatives, and the five chapters in Part II analyze examples of financial derivative abuse and misuse. Many readers, at some point, will be offered options as part of their employment compensation packages, so Chapter 1 focuses on employee stock options—why and how they are used and how they may be valued differently by employers and employees. Chapter 2 examines Roche Holding, a Swiss company, and how it successfully developed and implemented an iconoclastic financial strategy, using Bull Spread Warrants as part of this approach. The final chapter in Part I, "The Three Amigos", analyzes a dialogue among three friends planning an option trade using the idea of put-call parity.

Part II of this book examines, in chronological order, companies that have been commonly associated with the "rogues' gallery" of financial derivative disasters. Chapter 4 analyzes Metallgesellschaft, a German company that reported losses of $1.3 billion in 1993 due to mistakes associated with its offering of energy derivative contracts. Chapter 5 looks in detail at two interest-rate swaps transacted in 1993 and 1994 between Procter and

Gamble (P&G) and Bankers Trust, which resulted in losses for P&G of $157 million and led to some landmark court decisions in financial security law. Chapter 6 considers the investment strategy and events that caused Orange County to lose $1.6 billion in 1994, thereby earning it the ignoble reputation as the largest municipal failure in U.S. history. Chapter 7 explains the speculative trades of Nick Leeson, a middle-level bank manager at Barings Bank's Singapore branch, who, in 1995, lost $1.2 billion, resulting in the bankruptcy of one of the oldest and most prestigious banks in England. Finally, Chapter 8 analyzes Long-Term Capital Management—the company and partners, its strategy to build a risk-neutral portfolio, and the global events in 1998 that led the company to lose $3.5 billion in less than two months.

RESOURCE AND LEARNING MATERIAL

To motivate discussion and thoughtful reflection, I have provided end-of-chapter questions to test readers' understanding of the major principles in the text. To keep the length of the book manageable, Addison-Wesley has created a Web site at http://www.aw.com/marthinsen, where you can find embellishments and extensions of the subject matter in many of the chapters. The material currently on this site is as follows:

Chapter 2: Roche Holding: The Company, Its Financial Strategy, and Bull Spread Warrants

- Appendix 2.1: Should Corporate Treasuries be Profit Centers?

Chapter 4: Metallgesellschaft AG: Illusion of Profits and Losses, Reality of Cash Flows

- Appendix 4.1: Stack-and-Roll Hedge: Cash Flow Effects
- Appendix 4.2: Stack-and-Roll Hedge: Profit-and-Loss Effects
- Appendix 4.3: MGRM's Embedded Options

Chapter 5: Swaps That Shook an Industry: Procter & Gamble versus Bankers Trust

- Appendix 5.1: The Infamous Spread Formula
- Appendix 5.2: P&G–BT's Landmark Court Opinion
- Appendix 5.3: Disclosure Reform After the P&G–BT Swaps
- Appendix 5.4: Putting P&G–BT in Perspective: Other Derivative Disasters in the 1990s That Led to Financial Reform
- Appendix 5.5: Should Corporate Treasuries by Profit Centers?

Chapter 6: Orange County: The Largest Municipal Failure in U.S. History

- Appendix 6.1: Orange County's Recovery Plan
- Appendix 6.2: What Happened to Orange County's Public Services?
- Appendix 6.3: What Happened to Orange County's Debt Level and Credit Ratings?
- Appendix 6.4: What Happened to the Mountain of Orange County Legal Cases?

Chapter 8: Long-Term Capital *Mis*management: "JM and the Arb Boys"

- *Appendix 8.1: LTCM's Major Trades. This appendix is at the end of Chapter 8.
- Appendix 8.2: What Are the Problems with Value at Risk?
- Appendix 8.3: UBS and the LTCM Warrant Fiasco

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Each of the chapters in this book was read and commented on by numerous professors from colleges and universities and by industry experts around the world. I benefited enormously from feedback provided by the following reviewers: James Bennett, University of Massachusetts, Boston; Jeremy Berkowitz, University of Houston; Antonio Camara, Strathclyde University; Charles Q. Cao, Penn State University; Dr. Mukesh A. Chaudhry, Indiana University of Pennsylvania; Patrice Clarke, Simmons College; Anna Dodonova, University of Iowa; Imad Elhaj, University of Louisville; Ekaterina Emm, Georgia State University; Michael S. Haigh, University of Maryland; Shantaram Hegde, University of Connecticut; Ufuk Ince, University of Washington; Francis Laatsch, Bowling Green State University; Stewart Mayhew, University of Georgia; Lalatendu Misra, University of Texas, San Antonio; Nicholas Valeio III, Emory University; Niklas Wagner, Munich University of Technology; Jill Wetmore, Saginaw Valley State University; and Hongmin Zi, Ewha Women's University.

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Despite the time and effort that has gone into making this book error free and ensuring that the arguments are transparent and deductive, there are bound to be instances where errors may have gone undetected. I take full responsibility for the content in this book, and wish to invite readers to contact me (marthinsen@babson.edu) with any comments, insights, and/or constructive criticism they have, so that I might update the book.

I dedicate this book to my wife, Laraine, whose love, understanding, and patience have been sources of support in everything I have done and whose tenderness and sheer human kindness have been inspirations to me and most profoundly touched my heart.

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