

RISK MANAGEMENT, SPECULATION AND DERIVATIVE SECURITIES

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PREFACE

This book aims to cover the following general topics: the advanced application of risk management products; assessment of methods for managing and evaluating risk; and, the use of derivative securities for maximizing firm value. Using selected chapters and sections, it is possible to use this book as a text in advanced courses on derivative securities, financial risk management and international financial management. Yet, taken as a whole, this book goes beyond a textbook level discussion. The primary focus of the book is pedagogical, to provide instruction on the important but often overlooked connection between risk management and speculation. The central theme is to demonstrate that effective risk management requires an in depth understanding of speculative strategies.

To this end, this book aims to provide a unified treatment of important concepts and techniques that are useful in applying derivative securities in both risk management and speculative trading. Some of the techniques examined are well known, such as the Black-Scholes option pricing methodology. However, the extensions to specific situations, such as speculative trading strategies, are not. Other techniques to be examined in the book are either ignored or given too brief a treatment in conventional texts. This book is not intended to provide a comprehensive introduction to derivative securities. There are many excellent US sources that contain the relevant background material. This book aims to proceed beyond an introductory treatment of derivative securities, in order to have additional space and time to deal with more advanced topics. By design, this involves approaching the subject matter from a somewhat different perspective.

The central theme of the book revolves around the complementarity of the risk management decision problem and the speculative trader's decision problem. More precisely, it is demonstrated that optimal risk management decisions involve a speculative component; optimal risk management involves making speculative decisions. Hence, understanding of optimal strategies for speculative trading can assist in formulating appropriate risk management solutions. In turn, optimal speculation can be approached as a form of risk management decision problem, where the risk being managed arises from the speculative trading strategy. (As a practical illustration, this is the essence of the strategies employed by numerous hedge funds.) All this requires careful attention to be given to establishing a preliminary connection between risk management and speculation before proceeding to details of specific activities.

The book is divided into three parts. The first part deals with the general framework for risk management and speculation using derivative securities, the second and third parts deal with specific applications to forward contracts and options. Supplemented with components from the other two parts, each part is approximately equal to the material that can be contained in a one semester, senior undergraduate or Master's level course. A considerable amount of investments background is assumed at various points up to, say, the level of Alexander and Sharpe, *Investments* (1990). While at some points in the Options chapters (and associated Appendices) specialized mathematical knowledge is assumed, in general only basic algebra and calculus are sufficient to understand the discussion. Basic concepts are usually reviewed but without considerable explanation.

While this book is aimed at providing material relevant for academic presentations of derivative securities, the subject matter is also selected with the practitioner in mind. A substantial amount of the material covered is illustrated by practical applications involving what are, in many cases, exceedingly complicated arbitrage-based trading strategies. Considerable discussion is given to designing derivative security trading strategies based on the underlying arbitrage relationships. Specific attention is given to covered interest arbitrage and cash-and-carry arbitrages for metals. In order to accurately understand the concepts, numerous price quotes are used to illustrate the main concepts.

Relation to Other Books in the Field

The title of the book can be used to make a useful connection to where this book fits within the academic landscape. The subject of risk management spans a number of disciplines, including Management Science, Actuarial Studies, Strategic Management, Finance, Environmental Studies and Medical Science. The inclusion of derivative securities in the title is intended to restrict the discussion to risk management situations where derivative securities can be used. This extends the scope beyond financial risk management to include strategic business risk management but would not include, say, industrial engineering and biomedical applications. This permits the complementarity in the various theoretical approaches used to model the risk management process to be examined. Yet, even by restricting comparisons to books on financial risk management, there is still a considerable number and variation of texts available for comparison. Within this range are books on managing credit risk, e.g., Shaeffer (2000), value at risk, e.g., Jorion (2001), financial engineering, e.g., Mason, et al. (1995), Stulz (2001), as well as the more general texts on derivative securities, e.g., Wilmott (1998), Hull (2000).

Books on financial risk management can be roughly divided between those dealing with specific subjects in financial risk management, e.g., the value at risk books, and those dealing with financial risk management from a more general perspective, albeit motivated by specific examples. *Risk Management, Speculation and Derivative Securities* aims to cover the subject from the general perspective. The benchmark text for the general approach to managing financial risk is, arguably, Smithson, Smith and Wilford (1995). This popular text is a combination of introductory theoretical analysis and practical illustration. However, the analytical treatment is relatively elementary. The strength of the presentation lies with the practical applications. This text can be contrasted with texts, such as Doherty (1985), that have a strong theoretical motivation but give a somewhat artificial treatment of practical applications. Another benchmark text is Mason, et al. (1995) which takes a case approach to the subject matter, dealing with practical issues in a sophisticated manner, but largely submerging the theoretical discussion in the case analysis.

In terms of these texts, this book has a theoretical treatment of corporate risk management at a level similar to Doherty, though without taking the same approach to the subject matter. The treatment of practical applications differs significantly from the case intensive approach of Mason, et al. (1995). The approach of Smithson, Smith and Wilford is a closer approximation. Yet, these texts all suffer from being too narrowly focused on financial risk management. Extending the field of view to include strategic business risk management, e.g., Oxelheim and Wihlborg (1997), is both natural and compelling. The advanced techniques of finance can be integrated with the strategic notion that business risks are interrelated and, in general, can not be effectively analyzed in isolation from a range of other business risks. As a consequence, the market for this book will include both finance and strategic management.

In addition to texts dealing with financial and strategic risk management, this book also has substantial overlap with books on derivative securities. The number of excellent books on derivative securities is daunting. Starting in the early 1980's with Cox and Rubinstein (1985) and continuing to the present with Hull (2000), Jarrow and Turnbull (2000), and Wilmott (1998), the subject of derivative securities has produced efforts by many of the leading scholars in financial economics. It is difficult to carve a niche anywhere in this market. Yet, these texts are quite similar in content and approach: sophisticated treatments of derivative security valuation are the primary focus with risk management applications of secondary importance. To appeal to the academic textbook market for derivatives, these books devote considerable attention to describing the details of pricing various derivative securities. This leaves relatively little space to develop an advanced treatment of practical risk management applications.

An excellent example for comparison is Wilmott (1998). This text is 739 pages long, an impressive effort. Yet, only pp.529-612 is dedicated to Risk Management and Measurement. A similar number of pages is dedicated to exotic options, a topic that is interesting mathematically but not of central importance to practical applications. Almost 20 pages of the risk management section are dedicated to the portfolio management problem, compared to ten pages on value at risk. There is scattered treatment of practical issues elsewhere in Wilmott (1998) that

also illustrates the comparison. Eighteen pages are dedicated to static hedging, which is approached from the viewpoint of an options market maker seeking to hedge an options book. Again, this is theoretically interesting but not of much direct use to those seeking guidance on implementing or improving financial risk management within the practical context of maximizing firm value.

Acknowledgments

The preparation of this book required permission to reproduce material from journal articles, newspapers, books and magazines. The sources requiring permissions include the Toronto Globe and Mail, The Financial Post, Barrons, Wall Street Journal, New York Times, Journal of Derivatives, Journal of International Money and Finance, International Review of Economics and Finance, Canadian Journal of Economics, Journal of Financial and Quantitative Analysis, Journal of Futures Markets, the Journal of Finance, Review of Futures Markets, the Chicago Board of Trade *Commodity Trading Manual*, the National Futures Association *Application Guide*, and the Consolidated Gold Fields annual publication *Gold*. Useful information has also been obtained either directly or from the websites of the Winnipeg Commodity Exchange, the Montreal, Vancouver and Toronto Stock Exchanges, the B.C. Securities Commission, the Commodity Futures Trading Commission, the Chicago Board of Trade, the Chicago Mercantile Exchange, the New York Board of Trade and the Chicago Board Options Exchange.

Because this book is based on lecture notes prepared by the author starting around 1980 and continuing until the present, there have been numerous unnamed student contributions aimed at improving the exposition. Intellectual contributors that I have been acquainted with either as a student or colleague include Phoebus Dhrymes, Bernard Dumas, Franklin Edwards, Howard Sosin, Marcus Hutchins, Frank Jones, Mark Powers, Suresh Sundaresan, David Modest, Don Chance, Lance Smith, Steven Figlewski, Micheal Adler and John Heaney. Among those that I never had the opportunity to meet but whose writings had considerable influence include T. Hieronymous, H. Working, Anne Peck, R. Leuthold, John Cox, Mark Rubinstein, Fischer Black, R. Whalley, and H. Stoll. Finally, the anonymous reviewers for the book also provided helpful insights and corrections.