ROBERT T. DAIGLER

FINANCIAL FUTURES & OPTIONS MARKETS

CONCEPTS AND STRATEGIES

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ROBERT T. DAIGLER

Florida International University

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DEDICATION

To my family and friends
Especially to my daughters Wendy and Shaina
And to my wife Joyce

IN MEMORIUM

To Charles Ascencio
An Honest Person, a Patriot,
A Unique Individual who was enthusiastic about life
Why do the good ones die young?

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PREFACE

Students look forward to taking a course in futures and options markets. There is a mystery to these markets associated with their uniqueness and the possibility of becoming a millionaire by a few correct speculative decisions! In addition, the study of futures and options is directly associated with real-world uses and strategies such as "hedging" and "arbitrage." Moreover, few abstract theories are needed to explain futures and options concepts: The tools and explanations used here are employed by those working on Wall Street and in the investment and financial firms on Main Street, U.S.A. Overall, futures and options are more exciting than those "other" classes.

Unfortunately, there is no magic way to earn a million dollars in these markets without knowledge of what will happen to the underlying asset. However, this book will show how these markets are best used when the speculator has information (or strong beliefs) about the security or index being priced by the futures or options contract. Perhaps more important, this book examines how to manage risk by using futures and options. A speculator is willing to increase risk in order to obtain a higher return. A pension fund or company treasurer often wants to decrease risk by hedging. Investment managers are willing to take risk-free profits above the T-bill interest rate by engaging in arbitrage transactions. Therefore, risk management becomes a key focus in the use of futures and options contracts. Once the key concepts related to risk management (i.e., hedging, the pricing of these contracts, and arbitrage) are mastered, one can expect a rewarding career in using these instruments in the financial community.

This book is readable by anyone having at least one course in finance. However, it is recommended that a second finance course be taken to obtain more familiarity with how to solve finance numerical problems, to be exposed to a wider finance vocabulary, and to obtain practice in interpreting graphs. Those who have taken an Investments or Financial Markets course that has introduced futures and options markets will find the initial chapter(s) on these topics mostly a review. However, others need only put additional time into this material to "catch up." The book is appropriate for both upper level undergraduates and graduate students who want a conceptual and practical examination of futures and options.

I have tried to limit the coverage of futures and options material to the "essential" topics. However, there is much to know about these markets and there is a wide range of opinions on what material should be taught in a course on futures and options. Therefore, this text is difficult to cover in its entirety in one semester or one quarter. I strongly recommend that most of the material in Parts I (Futures) and III (Options) be covered for a futures and options course. (Those who want to concentrate on futures may wish to use the companion book *Financial Futures Markets* by Robert T. Daigler, Harper Collins Publishers, 1993.) Chapters from Parts II and IV can then be chosen based on time available and the interest of the instructor/class. Appendixes provide more in-depth study of given topic areas and are generally geared for more advanced students.

FEATURES OF THIS BOOK

- The mathematics used in this book is limited to what is needed for the futures and options markets. More advanced models and proofs can be found in the appendixes.
- The unique overview and terminology sections appear at the *beginning* of each chapter to provide a general background to the material before reading the chapter. Bulleted lists are given throughout to serve as a quick reference and review.
- "Focus" boxes provide insights into what happens in the financial world.
- Important material not found elsewhere, or given in rudimentary fashion, provides a greater depth to the coverage of these markets. For example, see the sections/chapters on market microstructure, the futures "pits," the options trading floor, financial engineering, and exotic options. Moreover, futures pricing of specific instruments (Chapters 8 and 9), duration and immunization (Chapter 10), applications of futures (Chapter 17), options sensitivities (Chapter 14), options on futures (Chapter 18), and currency options (Chapter 19) are covered in more detail than in most competing texts.
- Numerous figures, examples, exhibits, and tables provide insights and clarification to the material. In particular, the three-dimensional figures in the options chapters provide a unique perspective to the coverage of options.
- Most end-of-chapter problems are consistent with the chapter examples so that students can refer to the text material to help them understand the concepts.
- Empirical evidence shows that the concepts are relevant to real-world experience.
- PC options programs are discussed to make the options material more realistic and useful.

ORGANIZATION AND TOPICS

This book is organized to provide flexibility in the coverage of futures and options markets. After reading Chapter 1, either futures (Part I, and if desired Part II) or options (Part III, and if desired Part IV) can be covered. If futures markets are discussed first, then the instructor can use one type of contract, such as stock index futures, to explain the quotations and concepts given in Chapters 2 and 3. Alternatively, the quotations for all of the futures contracts in Chapter 2 can be discussed before proceeding to Chapter 3. On the other hand, if options are taken before futures, then the reader may want to review the quotations and basic concepts of cash markets in parts of Chapter 2.

Part I examines the important concepts relating to futures markets. The topics covered include: the quotations and characteristics of futures and related cash markets, terminology and concepts, pricing and arbitrage, how the trading "pits" work, and hedging concepts and techniques.

Part II provides specific information on how stock index and interest rate futures are priced and how arbitrage is executed. In addition, Chapter 10 discusses duration for bonds, immunization, and how duration is used with futures for hedging.

Part III provides coverage of options concepts, pricing, and strategies. Topics include the quotation of stock options, payoff diagrams of options, pricing concepts and models, the sensitivities of the option prices, and the option strategies of speculating, hedging and spreading.

Part IV provides applications of futures and options markets. Futures applications include methods for adjusting risk, such as portfolio insurance, and the ways in which financial institutions use futures. Options topics include options on futures, currency options, and exotic options. The basic concepts of financial engineering are also covered.

SUPPLEMENTS

Supplemental material is available to help the instructor best structure a course in futures and options markets. In addition, these supplements are now available for the companion text *Financial Futures Markets.*

- The Instructor's Manual provides answers to the problems at the back of the chapters, as well as additional problems and answers for students who want the extra practice. These additional problems can also be used by the instructor as exam questions. The Instructor's Manual also provides recommendations on the values of each problem and other suggestions relating to the course.
- Overhead transparency masters that summarize the important information in each chapter are available to adopters. The Instructor's Manual includes samples of the overhead transparency masters. These masters can be used for preparation, class coverage of the material, and/or for student use to minimize the need for note taking.
- Multiple choice and true-false questions covering the material in the chapters are available both in hard copy format and by using "Testmaster" software for the PC. Testmaster allows automatic test generation once the questions are chosen.
- Spreadsheet templates covering the important numerical problems in the text are available for adopters. These templates can be used as a substitute for manual calculation of the answers to check whether the manual calculations are correct. In addition, many of the spreadsheets provide graphs that help the student better comprehend the material. The spreadsheets are set up with a menu structure so that students with only a minimal understanding of a spreadsheet can use them. See the Instructor's Manual for more information on the spreadsheets.
- A complete bibliography on futures and options markets is available to adopters. The bibliography is an integrated version of the bibliographies that appear in *The Journal of Futures Markets,* plus additional option entries. Every article that relates to futures and futures options (and most articles on other options) is segregated into the type of market and into subheadings according to topic area.

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The quality of the options chapters of this book has been improved immeasurably by the generosity of Mark Rubinstein. When I was a Visiting Scholar at Stanford University, Mark Rubinstein graciously allowed me to attend his class offered by the University of California, Berkeley. His insights into the options markets helped me to solidify and coordinate my thinking concerning options. In addition, his organization of the material and presentation of notes to the class ranks him as the best instructor I know.

These notes are the source of many of the option tables on prices used in this text. Mark also provided me with a beta version of his PC software "Options and Futures Simulator" to create the three-dimensional graphs, many of the two-dimensional options graphs, and printouts of screens in the program. All of this material is referenced in the text. This material has allowed me to bring to finance two tools that I have told my students will be part of the future finance curriculum: three-dimensional surface graphs to help explain complicated relationships and sophisticated PC programs that bring reality to the classroom. I greatly appreciate Mark's generosity.

There are many other individuals who have helped improve the quality, readability, and completeness of this textbook. Reviewers of this book noted important areas for improvement and clarification. Students in my undergraduate and graduate classes in futures and options markets politely pointed out confusing passages and helped to clarify the end-of-chapter problems and answers. Officials at the Exchanges and financial institutions graciously provided information and ideas concerning the markets that helped to make this book more relevant to the users. Finally, my experiences as a Visiting Scholar at the Graduate School of Business at Standord allowed me to clarify issues related to futures and options markets and how models are employed on Wall Street. The gracious hospitality provided by the faculty at Stanford is appreciated and will remain a fond memory. I thank all of the above individuals, but retain the responsibility for the mistakes contained here.

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As I found in *Financial Futures Markets,* despite diligence and care, errors occur at various stages of such a complicated project as this one. I would appreciate knowing about any errors so that they can be corrected. In addition, comments on the structure, material included/excluded, and level of presentation would be appreciated.

Finally, I would like to thank my family for enduring yet another book. Shaina, my lovable seven-year-old, had a particularly difficult time understanding why her dad was always at the computer. Now it's time to do something other than books!

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