
FINANCIAL MODELING

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with a section on Visual Basic for Applications
by Benjamin Czaczkes

THIRD EDITION

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Preface

The two previous editions of *Financial Modeling* have received a gratifyingly positive response from readers. The “cookbook combination” that mixes explanation and implementation using Excel fulfills a need in both the academic and practitioner markets for readers who realize that the implementation of the finance basics typically studied in an introductory finance course requires another, more heavily computational and implementational, approach. Excel, the most widely used computational tool in finance, is a natural vehicle for deepening our understanding of the materials.

Financial Modeling is organized along six different subject areas. Each of the first four sections of the book relates to a specific area of finance. These sections are independent of each other, though the reader should realize that they all assume some familiarity with the finance area—*Financial Modeling* is not an introductory text. Section I (Chapters 1–7) deals with corporate finance topics; Section II (Chapters 8–15) with portfolio models; Section III (Chapters 16–24) with option models; and Section IV (Chapters 25–28) with bond-related topics.

The last two sections of *Financial Modeling* are technical in nature. Section V (Chapters 29–35) relates to various Excel topics that are used throughout the book. Chapters in this section can be read and accessed as necessary. Section VI (Chapters 36–41) deals with Excel’s programming language, Visual Basic for Applications (VBA). VBA is used throughout *Financial Modeling* to create functions and routines that make life easier, but it is never intrusive—in principle the reader can understand the materials in all of the other chapters of *Financial Modeling* without needing the VBA chapters.

New Chapters

Finance is a very dynamic area. The new edition of *Financial Modeling* contains many updates and changes that track new developments in the area of computational finance. In addition, almost all the chapters have been revised to make explanations more up-to-date. The third edition of *Financial Modeling* contains eight completely new chapters:

- Chapter 5 discusses bank valuation. The basic valuation framework of Chapter 3 is applied to the valuation of financial institutions.

- Chapter 13 adds an exposition of the Black-Litterman model of portfolio choice to the section on portfolio models. This model, widely used in asset allocation, is not discussed in any major textbook.
- Chapter 14 discusses event studies, the most prominent tool for judging the effect of market events on the returns of individual stocks.
- Chapter 20, on Greeks, has been added to Section III, on options.
- Chapters 22 and 23 discuss the implementation of Monte Carlo methods to option valuation.
- Chapter 34 discusses array functions, both those included with Excel and the construction of homemade array functions.
- Chapter 41 shows how to use VBA to extract Web information to Excel.

In addition to the new chapters, many of the *Financial Modeling* chapters have been substantially rewritten. Following are a few examples:

Chapter 2 includes a number of new cases used to illustrate the estimation of the cost of capital.

Chapter 4 has a new example (PPG Corporation) for the implementation of pro forma models and valuation.

Chapter 10 now includes a discussion of shrinkage methods and their use in the estimation of the variance-covariance methods.

Chapter 17 shows how to use the binomial option pricing model to price employee stock options.

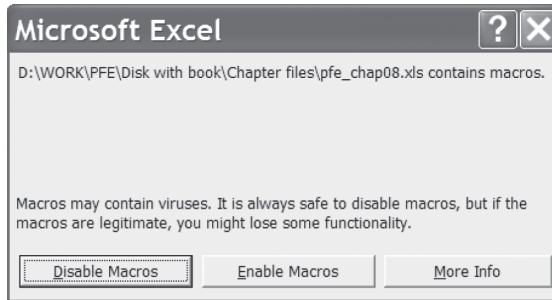
Chapter 19 adds discussions of structured securities and the Merton model within the framework of Black-Scholes.

Chapter 27, on polynomial term structure models, is based on new materials and a new data set of zero-coupon bonds from the Federal Reserve.

Getformula

The Excel files with this edition include a function called **Getformula** that enables the user to track cell contents. The disk that comes with *Financial Modeling* has a document on how users can add **Getformula** to their files. In order to allow **Getformula** to work, you must set your

Excel security settings (**Tools|Macro|Security**) to **Medium**. If you have done this, then when opening an Excel notebook, you will be confronted by the following screen:



You can safely click **Enable Macros**, which enables the formulas on the notebook. A separate file on the CD-ROM tells you how to implant this useful program on your own Excel notebooks.

Excel 2007

As this book went to press in late 2007, Excel 2007 was starting to be used on many computer systems. The differences between Excel 2007 and previous versions of Excel are largely esthetic and not substantive. Since most readers of this book are likely to have older versions of Excel on their computers, I have chosen to continue using Excel 2003 in this edition. A document relating to Excel 2007 is on the disk with *Financial Modeling*.

The Disk

The CD-ROM included with *Financial Modeling* provides files that give all the Excel contents of each chapter as well as files that give the answers to each of the end-of-chapter questions. All the book's files have been checked and work with Excel 2007. The disk also includes documents on the differences between Excel 2003 and Excel 2007, on adding **Getfor-**

mula to spreadsheets, and on some problems encountered with Excel's **XNPV** and **XIRR** functions.

Using *Financial Modeling* in a University Course

Financial Modeling has become the book of choice in many intermediate and advanced finance classes that stress the combination of modeling/Excel skills and a deeper understanding of the underlying financial models. The *Financial Modeling*-based courses are often a third- or fourth-year undergraduate or second-year MBA course. These courses are often very different from each other and include much instructor-specific input, but they seem to have a few general features:

- A typical course starts with two or three classes that stress the Excel skills needed for financial modeling. Often these classes are held in a computer lab. Though almost all business school students know Excel, they may not know how to finesse data tables (Chapter 30) or some of the basic financial functions (Chapters 1 and 33) and array functions (Chapter 34). The initial classes give the instructor a chance to level the playing field.
- Most one-semester courses then cover, at most, one of the *Financial Modeling* sections. If we assume that in a typical university course, covering one chapter per week is an upper limit (and many chapters will require two weeks), then a typical course might concentrate on either corporate finance (Chapters 1–7), portfolio models (Chapters 8–15), or options (Chapters 16–24). At a stretch, the instructor could perhaps throw in the shorter bond section (Chapters 25–28).
- I suggest that after the initial classes in a computer lab, the instructor move to a regular classroom. This enables the classroom emphasis to be on discussions of theory and implementation, with student homework concentrating on actual spreadsheets.

An alternative to the preceding structure is to build an even more advanced course around VBA. I teach a financial engineering course that starts with binomial option pricing, proceeds to cover some of the VBA chapters (36–38), and then covers Black-Scholes and Monte Carlo methods (Chapters 18–23).

A major problem with a computer-based course is how to structure the final examination. Two solutions seem to work well. One alternative is to have students (whether alone or in teams) submit a final project. Examples might be a corporate valuation if the course is based on Section I of the book, an event study for Section II, an option-based project for Section III, or the computation of a bond expected return if the emphasis is on Section IV. A second alternative is to have students submit, by e-mail, a spreadsheet-based examination with severe time limits. One instructor using this book sends his class the final exam (a compendium of spreadsheet problems) at nine o'clock in the morning and requires an e-mail with a spreadsheet answer by noon.

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Many of the changes in this edition of *Financial Modeling* are due to the comments of readers, who have been assiduous in offering suggestions and improvements for the book. I follow a tradition started with the first two editions of *Financial Modeling* by acknowledging those readers whose comments have been incorporated into this edition: Meni Abudy, Zvika Afik, Gordon Alexander, Naomi Belfer, David Biere, Vitaliy Bilyk, Oded Braverman, Roeland Brinkers, Salvio Cardozo, Israel Dac, Jeremy Darhansoff, Toon de Bakker, Govindvyas Dharwada, Davey Disatnik, Kevin Dowd, Brice Dupoyet, Orit Eshel, Yaara Geyra, Rana P. Ghosh, Bjarne Jensen, Marek Jochec, Milton Joseph, Erez Kamer, Saggi Katz, Emir Kiamilev, Paul Legerer, David Martin, Tom McCurdy, Tsahi Melamed, Tal Mofkadi, Geoffrey Morrisett, Sandip Mukherji, David Pedersen, Georgio Questo, Alex Riahi, Arad Rostampour, Joseph Rubin, Ofir Shatz, Mel Tukman, Guy Vishnia, Torben Voetmann, James Ward, Roberto Wessels, Geva Yaniv, and Werner Zitzman.

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As always, I welcome comments and corrections!

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