

John Lee · Jow-Ran Chang · Lie-Jane Kao ·
Cheng-Few Lee

Essentials of Excel VBA, Python, and R

Volume II: Financial Derivatives, Risk Management
and Machine Learning

Second Edition

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Volume II: Financial Derivatives, Risk
Management and Machine Learning

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Preface

In the new edition of this book, there are 49 chapters, and they are divided into two volumes. Volume I, entitled “Microsoft Excel VBA, Python, and R For Financial Statistics and Portfolio Analysis,” contains 26 chapters. Volume II entitled, “Microsoft Excel VBA, Python, and R For Financial Derivatives, Financial Management, and Machine Learning,” contains 23 chapters. Volume I is divided into two parts. Part I Financial Statistics contains 21 chapters. Part II Portfolio Analysis contains five chapters. Volume II is divided into five parts. Part I Excel VBA contains three chapters. Part II Financial Derivatives contains six chapters. Part III Applications of Python, Machine Learning for Financial Derivatives, and Risk Management contains six chapters. Part IV Financial Management contains four chapters, and Part V Applications of R Programs for Financial Analysis and Derivatives contains three chapters.

Part I of this volume discusses advanced applications of Microsoft Excel Programs. Chapter 2 introduces Excel programming, Chap. 3 introduces VBA programming, and Chap. 4 discusses professional techniques used in Excel and Excel VBA techniques. There are six chapters in Part II. Chapter 5 discusses the decision tree approach for the binomial option pricing model, Chap. 6 discusses the Microsoft Excel approach to estimating alternative option pricing models, Chap. 7 discusses how to use Excel to estimate implied variance, Chap. 8 discusses Greek letters and portfolio insurance, Chap. 9 discusses portfolio analysis and option strategies, and Chap. 10 discusses simulation and its application.

There are six chapters in Part III, which describe applications of Python, machine learning for financial analysis, and risk management. These six chapters are Linear Models for Regression (Chap. 11), Kernel Linear Model (Chap. 12), Neural Networks and Deep Learning (Chap. 13), Applications of Alternative Machine Learning Methods for Credit Card Default Forecasting (Chap. 14), An Application of Deep Neural Networks for Predicting Credit Card Delinquencies (Chap. 15), and Binomial/Trinomial Tree Option Pricing Using Python (Chap. 16).

Part IV shows how Excel can be used to perform financial management. Chapter 17 shows how Excel can be used to perform financial ratio analysis, Chap. 18 shows how Excel can be used to perform time value money analysis, Chap. 19 shows how Excel can be used to perform capital budgeting under certainty and uncertainty, and Chap. 20 shows how Excel can be used for financial planning and forecasting. Finally, Part V discusses applications of R programs for financial analysis and derivatives. Chapter 21 discusses the theory and application of hedge ratios. In this chapter, we show how the R program can be used for hedge ratios in terms of three econometric methods. Chapter 22 discusses applications of a simultaneous equation in finance research in terms of the R program. Finally, Chap. 23 discusses how to use the R program to estimate the binomial option pricing model and the Black and Scholes option pricing model.

In this volume, Chap. 14 was contributed by Huei-Wen Teng and Michael Lee. Chapter 15 was contributed by Ting Sun, and Chap. 22 was contributed by Fu-Lai Lin.

There are two possible applications of this volume:

- A. to supplement financial derivative and risk management courses.
- B. to teach students how to use Excel VBA, Python, and R to analyze financial derivatives and perform risk management.

In sum, this book can be used by academic courses and for practitioners in the financial industry. Finally, we appreciate the extensive help of our assistants Xiaoyi Huang and Natalie Krawczyk.

Morris Plains, USA
Hsinchu, Taiwan
Taipei City, Taiwan
North Brunswick, USA
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