STATISTICAL TECHNIQUES in Business AND ECONOMICS

第十一版

商务与经济统计技术

道格拉斯·A. 林德(Douglas A. Lind)
威廉·G. 马克(William G. Marchal)
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序

世界金融市场的蓬勃发展需要大量合格的金融从业人员，需要有全球通行的金融语言和行为标准。无论投资者、企业还是金融管理层都需要用统一、规范的标准来衡量金融分析人员的知识水平、道德规范和专业化程度，从而建立起对他们所提供的金融服务和所管理的金融资产的信赖。由此，特许金融分析师（Chartered Financial Analyst，简称CFA）应运而生。

作为全球通行的、最权威的金融市场专业人员的资格认证，CFA创办于20世纪60年代初，主办CFA考试和授予CFA特许状的权威机构是美国投资管理研究协会。目前，CFA资格授予各个投资领域内的专业人士，包括基金经理、证券分析师、财务总监、投资顾问、投资银行家、交易员等等。CFA要求它的持有人建立严格而广泛的金融知识体系，掌握金融投资行业各核心领域的理论与实践知识，包括从投资组合管理到金融资产估价，从衍生证券到固定收益证券以及定量分析。与此相适应，CFA的课程设置和考试内容深深根植于投资管理的实践，涉及广泛的金融投资方面的基础知识，并且考试标准和阅读书目每年都在变化，以反映投资领域的最新变化。

为适应经济日益全球化、信息化、金融化的发展趋势，促进我国资本市场的发展，并配合CFA资格考试在国内的展开，以方便广大考生应考，以及满足相关财经领域从业人员和广大师生的学习需求，中信出版社推出了CFA系列丛书。该系列包含两个子系列：影印系列和翻译系列。我们衷心地希望这套丛书的推出能够对广大的读者有所帮助。

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To Jane, my wife and best friend, and to our sons,
Mike, Steve, and Mark

Douglas A. Lind

To Andrea, my heart and the mother of my children:
Rachel Anne (and Eric), Joseph Andrew, Sarah Louise,
Christopher Brophy, and Mary Bridget

William G. Marchal

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Preface

As the name implies, the objective of *Statistical Techniques in Business and Economics* is to provide students majoring in economics, finance, marketing, accounting, management, and other fields of business administration, with an introductory survey of the many business applications of descriptive and inferential statistics. While we have focused on business applications, we have also attempted to use examples and problems that are student oriented and that do not require previous business courses.

When Bob Mason wrote the first edition of this text in 1967, locating relevant data was difficult. That has changed! Today, locating data is not a problem. The number of items you purchase at the grocery store is automatically recorded at the checkout stand. Phone companies keep track of the length of a call, the time it was made, and the number of the person called. Medical devices can automatically monitor and record our heart rate, blood pressure, and temperature. A large amount of business information is recorded and reported almost instantly. CNN, *USA Today,* and Yahoo!, for example, have websites where you can track stock prices with a delay of less than 20 minutes.

Today, skills are needed to deal with all this numerical information. First, we need to be critical consumers of information presented by others. Second, we need to be able to reduce large amounts of data into a meaningful form so that we can make effective interpretations, judgments, and decisions.

Today, all students not only have calculators, but many have their own computers or at least have access to a computer in a campus lab. Statistical software is also widely available, as is electronically-stored data. In response to these changes, we include screen captures from Excel and MINITAB within the chapters. This enables the student to actually view the output. The commands necessary to achieve the software results are at the end of the chapter. We have replaced many of the calculation examples with interpretation ones, to aid the student in communicating the statistical results.

While making these changes, we have not moved away from presenting, as best we can, the key concepts, along with supporting examples. The eleventh edition of *Statistical Techniques in Business and Economics* is the product of many people: students, colleagues reviewers, and the staff at McGraw-Hill/Irwin. We thank them all. We wish to express our sincere gratitude to the reviewers:

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Their suggestions and thorough review of the previous edition and the manuscript for this edition made this a better text.

A special thanks goes to a number of people. Dr. Leonard Presby, of William Paterson University, Dr. Jerzy Kamburowski, of The University of Toledo, and Dr. Roberta Thomas, of The University of Phoenix, reviewed the manuscript and checked the exercises for accuracy. Professor Walter H. Lange, of The University of Toledo, prepared the Study Guide, and Dr. Samuel Wathen, of Coastal Carolina University, prepared the test bank and checked the text for accuracy. Ms. Denise Heban and the text authors prepared the Instructor's Manual, and Ms. Jane Lind the PowerPoint Presentation. We appreciate their efforts on the project.

We also would like to thank the staff at McGraw-Hill/Irwin. This includes Richard T. Hercher, Jr., Executive Editor; Christina Sanders, Development Editor; Zina Craft, Marketing Manager, Jim Labeots, Project Manager; and others who we don't know personally, but who we know made valuable contributions.

ANote to the Student

We have tried to make this material "no more difficult than it needs to be." By that we mean we always keep the explanations practical without oversimplifying. We have used examples similar to those you will encounter in the business world. When you have completed this book, you will understand how to apply statistical tools to help make business decisions. In addition, you will find that many of the topics and methods you learn can be used in other courses in your business education, and that they are consistent with what you encounter in other quantitative or statistics electives.

There is no doubt that today there is more data available to a business than ever. However, people who can convert data in useful information and interpret it well are in short supply. If you thoughtfully work through this text, you will be well prepared to contribute to the success and development of your company. Remember, as one of the authors read recently in a fortune cookie, "None of the secrets of success will work unless you do."

Learning Aids

We have designed the text to assist you in taking this course without the anxiety often associated with statistics. These learning aids are all intended to help you in your study.

Objectives Each chapter begins with a set of learning objectives. They are designed to provide focus for the chapter and to motivate learning. These objectives indicate what you should be able to do after completing the chapter. We include a photo that ties these chapter objectives to one of the exercises within the chapter.

Introduction At the start of each chapter, we review the important concepts of the previous chapter(s) and describe how they link to what the current chapter will cover.

Definitions Definitions of new terms or terms unique to the study of statistics are set apart from the text and highlighted. This allows easy reference and review.

Formulas Whenever a formula is used for the first time it is boxed and numbered for easy reference. In addition, a formula card that summarizes the key formulas is bound into the text. This can be removed and carried for quick reference as you do homework or review for exams.

Margin Notes There are more than 300 concise notes in the margin. Each emphasizes the key concept being presented immediately adjacent to it.

Examples/Solutions We include numerous examples with solutions. These are designed to show you immediately in detail, how the concepts can be applied to business situations.

Statistics in Action Statistics in Action articles are scattered throughout the text, usually about two per chapter. They provide unique and interesting applications and historical insights into statistics.

Self-Reviews Self-reviews are interspersed throughout the chapter and each is closely patterned after the preceding **Example/Solution.** They will help you monitor your progress and provide immediate reinforcement for that particular technique. The answers and methods of solution are located at the end of the chapter.

Exercises We include exercises within the chapter, after the **Self-Reviews**, and at the end of the chapter. The answers and method of solution for all odd-numbered exercises are at the end of the book. For most exercises with more than 20 observations, the data is on the CD-ROM in the text.

Chapter Outline As a summary, each chapter includes a chapter outline. This learning aid provides an opportunity to review material, particularly vocabulary, and to see and review the formulas again.

Web Exercises Almost all chapters have references to the Internet for companies, government organizations, and university data sets. These sites contain interesting and relevant information to enhance the exercises at the end of the chapters.

Computer Data Exercises In most chapters, the last four exercises refer to four large business data sets. A complete listing of the data is available in the back of the text and on the CD-ROM included with the text.

Section Reviews After selected groups of chapters, a section review is included. This includes a brief review of the chapters, a glossary of the key terms, and a practice examination of the material covered. This review also includes cases that let you make decisions using tools and techniques from a variety of chapters.

Supplements

The **Student CD** packaged free with all copies of the text, features self-graded practice quizzes. Software tutorials, PowerPoint slides, the data files (in MINITAB, Excel, and ASCII formats) for the end of chapter data and for exercises having 20 or more data values. As well as an Internet link to the text web site and to the web sites listed in the Web exercises in the text. Also included is MegaStat for Excel, by J. B. Orris, software that enhances the power of Excel in statistical analysis. Visual Statistics 20, written by Doanne, Tracy, and Mathieson, is also included. Visual Statistics is a software program for teaching and learning statistics through interactive experimentation and visualization.

A comprehensive **Study Guide,** written by Professor Walter Lange of The University of Toledo, is organized much like the textbook. Each chapter includes objectives, a brief summary of the chapter, problems and their solution, self-review exercises, and assignment problems.

Douglas A. Lind
William G. Marchal

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