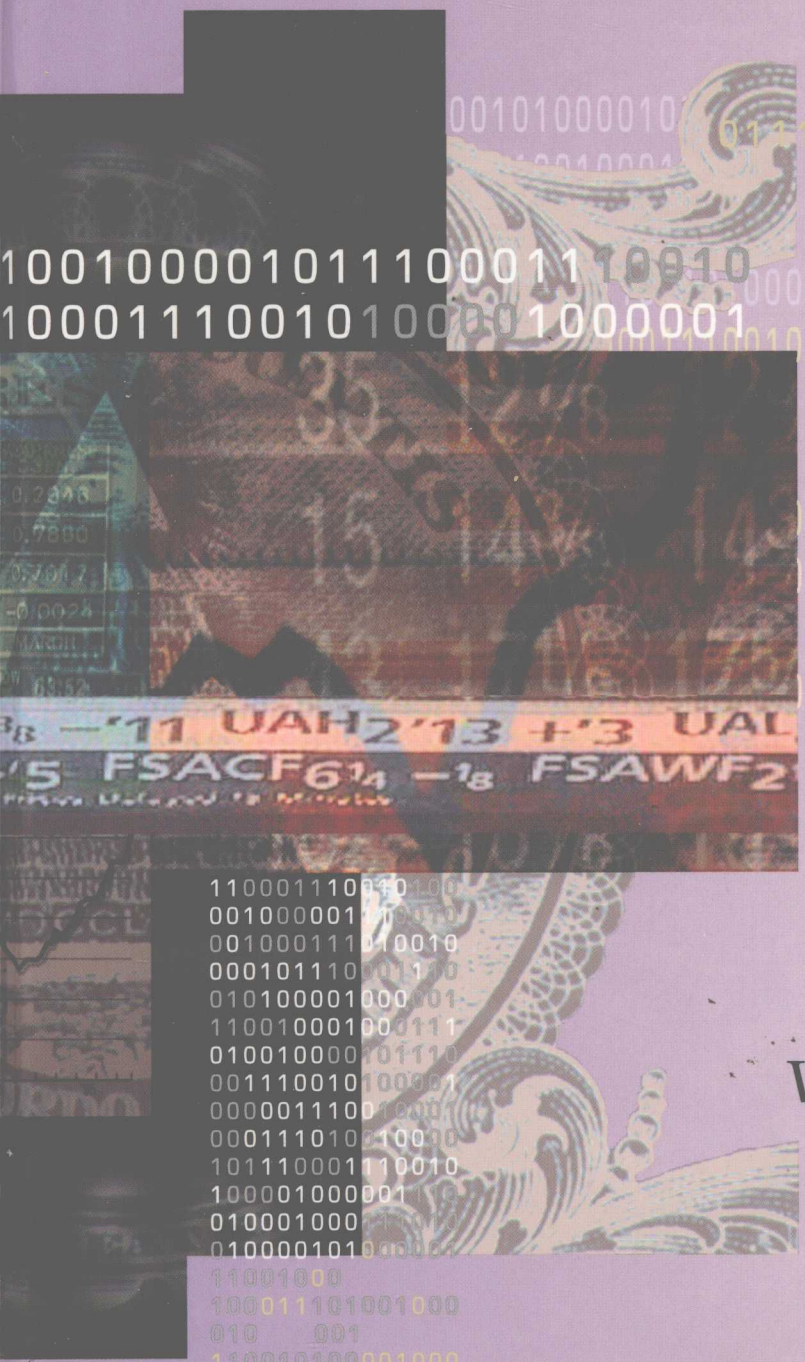
STATISTICAL TECHNIQUES IN BUSINESS AND ECONOMICS

tenth edition



Robert D. Mason
Douglas A. Lind
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Tenth Edition

Statistical Techniques in BUSINESS AND ECONOMICS

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To Jane and Andrea

In memory of Robert D. Mason
Author, mentor, colleague, and friend

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.

When Bob Mason wrote the first edition of this text back in 1967, locating relevant data was a problem. That has changed! Today, locating data is not a problem. The number of items you purchase at the grocery store is automatically recorded. The phone company keeps track of the length of a call, the time of the day the call was made, and the number of the people called. Medical devices 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 NBC News, for example, have web sites where you can track stock prices with a delay of less than 20 minutes. There are volumes of information on sports.

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 decisions.

When we began teaching, only a few students had calculators. Today, many students have a computer at home or in their dorm room, and most have access to a computer in a Computer Lab. Statistical software is widely available, as is electronically stored data. In response to these changes, we have made some changes in the text, such as adding Excel screen captures within chapters and commands at the end of chapters, replacing some calculation examples with interpretation ones, and so forth. In this edition we continue the use of MINITAB software but add Excel spreadsheet examples because much of the current world uses Microsoft applications.

Users of previous editions will notice another change, the addition of William G. Marchal as a coauthor. Bill is a longtime friend and colleague at The University of Toledo. We have collaborated for years on book writing projects, including, informally, this one. I am pleased to welcome him and acknowledge his significant contribution to this edition. On a sad note, Bob Mason, the original author of this text, passed away during this revision. We dedicate this edition to his memory. We will miss him as a coauthor, mentor, colleague, and most importantly as a friend.

Acknowledgments

The tenth edition of *Statistical Techniques in Business and Economics* is the product of many people: students, colleagues, reviewers, and the staff at Irwin/McGraw-Hill. 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.

Special thanks go to a number of people. Dr. Louis A. Patille, of the University of Phoenix, Ralph Harris, of St. Ambrose University, and Mr. Ray Pohlman each solved all of the exercises and checked our answers for accuracy. Gwen H. Terwilliger and Walter H. Lange, both of The University of Toledo, prepared the Test Bank and the Study Guide, respectively. Ms. Denise Heban and the text authors prepared the Instructor's Manual, and Mr. Christopher B. X. Marchal the Power Point Presentation. We appreciate their efforts on the project.

We also would like to thank the staff at Irwin/McGraw-Hill. This includes: Richard T. Hercher, Jr, the Executive Editor; Gail Korosa, Senior Development Editor; Carrie Sestak, Project Manager; and others who we don't know personally, but who we know made valuable contributions.

D.A.L.
W.G.M.

A Note to the Student

As the name implies, the purpose of the tenth edition of *Statistical Techniques in Business and Economics* is to provide students in marketing, accounting, finance, international business, sales, management, and other fields of business and economics with a sound introduction to descriptive and inferential statistics. The book, however, is also appropriate for use in other subject areas, such as the various social sciences. You will find the text provides excellent preparation for decision-making problems in various facets of business and economics and a good background for advanced courses involving statistical analysis.

Learning Aids

We have designed the text to assist you in approaching the 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 provide a 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 Formulas used for the first time are boxed and numbered for easy reference. In addition, a formula card that summarizes these key formulas is bound into the text.

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 applications of the concepts being presented.

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 exercises with more than 20 observations, the data can be found on the CD-ROM supplied with 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 Internet Web sites for companies, government organizations, and university data sets. These Web 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 are written around four 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

Student CD-ROM packaged free with all copies of the text, features practice quizzes, PowerPoint slides, the data files (in MINITAB, Excel, and ASCII formats) for the end of book large data sets and for exercises having 20 or more data values, and 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.

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

Douglas A. Lind
William G. Marchal

Brief Contents

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