

Applied Business Statistics

Methods and *Excel*-based Applications

Fourth edition

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Preface

This text is aimed at students of management who need to have an appreciation of the role of statistics in management decision making. The statistical treatment of business data is relevant in all areas of business activity and across all management functions (i.e. marketing, finance, human resources, operations and logistics, accounting, information systems and technology). Statistics provides evidence-based information which makes it an important decision support tool in management.

This text aims to differentiate itself from other business statistics texts in two important ways. It seeks:

- to present the material in a *non-technical* manner to make it easier for a student with limited mathematical background to grasp the subject matter; and
- to develop an *intuitive understanding* of the techniques by framing them in the context of a management question, giving layman-type explanations of methods, using illustrative business examples and focusing on the management interpretations of the statistical findings.

Its overall purpose is to develop a management student's statistical reasoning and statistical decision-making skills to give him or her a competitive advantage in the workplace.

This fourth edition continues the theme of using *Excel* as a computational tool to perform statistical analysis. While all statistical functions have been adjusted to the *Excel* (2013) format, the statistical output remains unchanged. Using *Excel* to perform the statistical analysis in this text allows a student:

- to examine more realistic business problems with larger datasets;
- to focus more on the statistical interpretation of the statistical findings; and
- to transfer this skill of performing statistical analysis more easily to the work environment.

In addition, this fourth edition introduces a number of new features. These include:

- *additional topics* to widen the scope of management questions that can be addressed through statistical analysis. These topics include breakdown analysis (a summary table analysis of numeric data) (Chapter 3); Bayes' theorem in probability (Chapter 4); Single and two population variances tests (Chapters 8 and 9); two-factor ANOVA (to examine additional factor effects) (Chapter 11); and multiple regression (to build and explore more realistic prediction models) (Chapter 13). These topics may be of more interest to MBA students and can be left out of any first level course in Business Statistics without any loss of continuity.
- The inclusion of two mini-case studies at the end of Chapter 3 to allow a student to integrate their understanding and interpretative skills of the tools of descriptive statistics.
- additional *statistical tables* (binomial, poisson and the F-distribution (for $\alpha = 0.025$)).
- *summary flowcharts* of descriptive statistical tools and hypotheses test scenarios. These flowcharts provide both a framework to understand the overall picture of each component and to serve as a decision aid to students to select the appropriate statistical analysis based on the characteristics of the management question being addressed.
- a set of exercises for Chapter 6 to test understanding of the concepts of sampling.

This text continues to emphasise the applied nature and relevancy of statistical methods in business practice with each technique being illustrated with practical examples from the South African business environment. These worked examples are solved manually (to show the rationale and mechanics of each technique) and – at the end of each chapter – the way in which *Excel* (2013) can be used is illustrated. Each worked example provides a clear and valid management interpretation of the statistical findings.

Each chapter is prefaced by a set of learning outcomes to focus the learning process. The exercises at the end of each chapter focus both on testing the student's understanding of key statistical concepts and on practicing problem-solving skills either manually or by using *Excel*. Each question requires a student to provide clear and valid management interpretations of the statistical evidence generated from the analysis of the data.

The text is organised around four themes of business statistics:

- setting the statistical scene in management (i.e. emphasising the importance of statistical reasoning and understanding in management practice; drawing attention to the need to translate management questions into statistical analysis; reviewing basic statistical concepts and terminology; and highlighting the need for data integrity to produce valid and meaningful information for management decision making)
- observational decision making (using evidence from the tools of exploratory data analysis)
- statistical (objective) decision making (using evidence from the field of inferential statistics)
- exploring and exploiting statistical relationships for prediction/estimation purposes (using the tools of statistical modelling).

The chapter on Financial Calculations (interest, annuities and net present value (NPV)) has been moved to the digital platform and can be accessed through the internet link to this text (<http://jutaacademic.co.za/support-material/detail/applied-business-statistics>).

Finally, this text is designed to cover the statistics syllabi of a number of diploma courses in management at tertiary institutions and professional institutes. With the additional content, it is also suitable for a semester course in a degree programme at universities and business schools, and for delegates on general management development programmes. The practical, management-focused treatment of the discipline of statistics in this text makes it suitable for all students of management with the intention of developing and promoting evidence-based decision making skills.

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