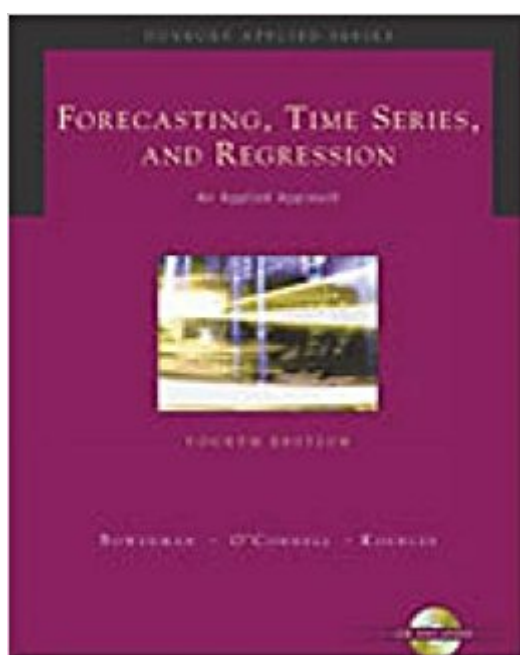


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# Forecasting, Time Series, And Regression (with CD-ROM) (Forecasting, Time Series, & Regression)



## Synopsis

Awarded Outstanding Academic Book by CHOICE magazine in its first edition, FORECASTING, TIME SERIES, AND REGRESSION: AN APPLIED APPROACH now appears in a fourth edition that illustrates the vital importance of forecasting and the various statistical techniques that can be used to produce them. With an emphasis on applications, this book provides both the conceptual development and practical motivation students need to effectively implement forecasts of their own. Bruce Bowerman, Richard O'Connell, and Anne Koehler clearly demonstrate the necessity of using forecasts to make intelligent decisions in marketing, finance, personnel management, production scheduling, process control, and strategic management. In addition, new technology coverage makes the latest edition the most applied text available on the market.

## Book Information

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Part I: INTRODUCTION AND REVIEW OF BASIC STATISTICS. 1. An Introduction to Forecasting. Forecasting and Data. Forecasting Methods. Errors in Forecasting. Choosing a Forecasting Technique. An Overview of Quantitative Forecasting Techniques. 2. Basic Statistical Concepts. Populations. Probability. Random Samples and Sample Statistics. Continuous Probability Distributions. The Normal Probability Distribution. The t-Distribution, the F-Distribution, the Chi-Square Distribution. Confidence Intervals for a Population Mean. Hypothesis Testing for a Population Mean. Exercises. Part II: REGRESSION ANALYSIS. 3. Simple Linear Regression. The Simple Linear Regression Model. The Least Squares Point Estimates. Point Estimates and Point

Predictions. Model Assumptions and the Standard Error. Testing the Significance of the Slope and y Intercept. Confidence and Prediction Intervals. Simple Coefficients of Determination and Correlation. An F Test for the Model. Exercises. 4. Multiple Linear Regression. The Linear Regression Model. The Least Squares Estimates, and Point Estimation and Prediction. The Mean Square Error and the Standard Error. Model Utility:  $R^2$ , Adjusted  $R^2$ , and the Overall F Test. Testing the Significance of an Independent Variable. Confidence and Prediction Intervals. The Quadratic Regression Model. Interaction. Using Dummy Variables to Model Qualitative Independent Variables. The Partial F Test: Testing the Significance of a Portion of a Regression Model. Exercises. 5. Model Building and Residual Analysis. Model Building and the Effects of Multicollinearity. Residual Analysis in Simple Regression. Residual Analysis in Multiple Regression. Diagnostics for Detecting Outlying and Influential Observations. Exercises. Part III: TIME SERIES REGRESSION, DECOMPOSITION METHODS, AND EXPONENTIAL SMOOTHING. 6. Time Series Regression. Modeling Trend by Using Polynomial Functions. Detecting Autocorrelation. Types of Seasonal Variation. Modeling Seasonal Variation by Using Dummy Variables and Trigonometric Functions. Growth Curves. Handling First-Order Autocorrelation. Exercises. 7. Decomposition Methods. Multiplicative Decomposition. Additive Decomposition. The X-12-ARIMA Seasonal Adjustment Method. Exercises. 8. Exponential Smoothing. Simple Exponential Smoothing. Tracking Signals. Holt's Trend Corrected Exponential Smoothing. Holt-Winters Methods. Damped Trends and Other Exponential Smoothing Methods. Models for Exponential Smoothing and Prediction Intervals. Exercises. Part IV: THE BOX-JENKINS METHODOLOGY. 9. Nonseasonal Box-Jenkins Modeling and Their Tentative Identification. Stationary and Nonstationary Time Series. The Sample Autocorrelation and Partial Autocorrelation Functions: The SAC and SPAC. An Introduction to Nonseasonal Modeling and Forecasting. Tentative Identification of Nonseasonal Box-Jenkins Models. Exercises. 10. Estimation, Diagnostic Checking, and Forecasting for Nonseasonal Box-Jenkins Models. Estimation. Diagnostic Checking. Forecasting. A Case Study. Box-Jenkins Implementation of Exponential Smoothing. Exercises. 11. Box-Jenkins Seasonal Modeling. Transforming a Seasonal Time Series into a Stationary Time Series. Three Examples of Seasonal Modeling and Forecasting. Box-Jenkins Error Term Models in Time Series Regression. Exercises. 12. Advanced Box-Jenkins Modeling. The General Seasonal Model and Guidelines for Tentative Identificatio. Intervention Models. A Procedure for Building a Transfer Function Model. Exercises. Appendix A: Statistical Tables Appendix B: Matrix Algebra for Regression Calculations. Matrices and Vectors. The Transpose of a Matrix. Sums and Differences of Matrices. Matrix Multiplication. The Identity Matrix. Linear Dependence and Linear Independence. The Inverse of a Matrix. The

Least Squares Point Estimates. The Unexplained Variation and Explained Variation. The Standard Error of the Estimate  $b$ . The Distance Value. Using Squared Terms. Using Interaction Terms. Using Dummy Variable. The Standard Error of the Estimate of a Linear Combination of Regression Parameters. Exercises. Appendix C: References.

Bruce L. Bowerman is a professor of decision sciences at Miami University in Oxford, Ohio. He received his Ph.D. in statistics from Iowa State University in 1974 and has over 32 years of experience teaching basic statistics, regression analysis, time series forecasting, and design of experiments to both undergraduate and graduate students. In 1987 Professor Bowerman received an Outstanding Teaching award from the Miami University senior class, and in 1992 he received the Effective Educator award from the Richard T. Farmer School of Business Administration. Together with Richard T. O'Connell, Professor Bowerman has written ten textbooks. In addition to the earlier editions of this forecasting textbook, these textbooks include BUSINESS STATISTICS IN PRACTICE and LINEAR STATISTICAL MODELS: AN APPLIED APPROACH. The first edition of FORTECASTING AND TIME SERIES earned an Outstanding Academic Book award from CHOICE magazine. Professor Bowerman has also published a number of articles in applied stochastic processes, time series forecasting, and statistical education.

Richard T. O'Connell is an associate professor of decision sciences at Miami University in Oxford, Ohio. He has more than 27 years of experience teaching basic statistics, statistical quality control and process improvement, regression analysis, time series analysis, and design of experiments to both undergraduate and graduate business students. He also has extensive consulting experience and has taught workshops dealing with statistical quality control and process improvement for a variety of companies in the Midwest. In 2000 Professor O'Connell received an Effective Educator award from the Richard T. Farmer School of Business Administration. Together with Bruce L. Bowerman he has written ten textbooks. In addition to the earlier editions of this forecasting textbook, these textbooks include BUSINESS STATISTICS IN PRACTICE and LINEAR STATISTICAL MODELS: AN APPLIED APPROACH. Professor O'Connell has published numerous articles in the area of innovative statistical education and statistical quality control. He is one of the first college instructors in the United States to integrate statistical process control and process improvement methodology into his basic business statistics course. Professor O'Connell received an M.S. degree in decision sciences from Northwestern University in 1973, and he is currently a member of both the Decision Sciences Institute and the American Statistical Association.

Anne B. Koehler is a professor of decision sciences and the George and Mildred Panuska Professor of Business Administration at Miami

University in Oxford, Ohio. She received a Ph.D. in mathematics in 1968 from Indiana University. Her interest in forecasting began with an internship at the J.M. Smucker Company in 1980. Professor Koehler began teaching statistics in 1975 and forecasting in 1990. She teaches courses in basic statistics, regression analysis, time series forecasting, and survey sampling. She is co-author of a paper in the JOURNAL OF THE AMERICAN STATISTICAL SOCIETY (1997) that presented a state space model for the Holt-Winters multiplicative model and provided that method with a sound statistical basis. Professor Koehler has numerous publications, many of which are on forecasting with seasonal models and exponential smoothing methods. She is an associate editor for the INTERNATIONAL JOURNAL OF FORECASTING, and for many years was the editor of the software reviews for that journal. She served on the Board of Directors of the International Institute of Forecasters for 10 years. She is also an associate editor for DECISION SCIENCES and has twice served on the Board of Directors of the Decision Sciences Institute.

This book was required for a Time Series Course. I would not recommend it if you can avoid it. There is no theory in this book. The book's answer to time series analysis is put the data in the software and read the output. Don't expect any real understanding of time series.

I believe this book is easier to read than Brockwell's, but it doesn't go as deep into the subject. It's a great book for an introductory semester.

Just what I expected, and it arrived on time. Well packaged!

entire chapter 7 gone.

good

really nice book. Great for a beginner

Cool

No problems at all, thank you :-)

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