Time Series Analysis. Wiley Series in Probability and Statistics

Description: A modern and accessible guide to the analysis of introductory time series data

Featuring an organized and self-contained guide, Time Series Analysis provides a broad introduction to the most fundamental methodologies and techniques of time series analysis. The book focuses on the treatment of univariate time series by illustrating a number of well-known models such as ARMA and ARIMA.

Providing contemporary coverage, the book features several useful and newly-developed techniques such as weak and strong dependence, Bayesian methods, non-Gaussian data, local stationarity, missing values and outliers, and threshold models. Time Series Analysis includes practical applications of time series methods throughout, as well as:

- Real-world examples and exercise sets that allow readers to practice the presented methods and techniques
- Numerous detailed analyses of computational aspects related to the implementation of methodologies including algorithm efficiency, arithmetic complexity, and process time
- End-of-chapter proposed problems and bibliographical notes to deepen readers' knowledge of the presented material
- Appendices that contain details on fundamental concepts and select solutions of the problems implemented throughout
- A companion website with additional data files and computer codes

Time Series Analysis is an excellent textbook for undergraduate and beginning graduate-level courses in time series as well as a supplement for students in advanced statistics, mathematics, economics, finance, engineering, and physics. The book is also a useful reference for researchers and practitioners in time series analysis, econometrics, and finance.

Wilfredo Palma, PhD, is Professor of Statistics in the Department of Statistics at Pontificia Universidad Católica de Chile. Dr. Palma has published several refereed articles and has received over a dozen academic honors and awards. His research interests include time series analysis, prediction theory, state space systems, linear models, and econometrics. He is the author of Long-Memory Time Series: Theory and Methods, also published by Wiley.

Contents:

Preface xiii
Acknowledgments xvii
Acronyms xix
1 Introduction 1
1.1 Time Series Data 2
1.2 Random Variables and Statistical Modeling 16
1.3 Discrete-Time Models 22
1.4 Serial Dependence 22
1.5 Nonstationarity 25
1.6 Whiteness Testing 32
1.7 Parametric and Nonparametric Modeling 36
1.8 Forecasting 38
1.9 Time Series Modeling 38
1.10 Bibliographic Notes 39

Problems 39

2 Linear Processes 43
2.1 Definition 44
2.2 Stationarity 44
2.3 Invertibility 45
2.4 Causality 46
2.5 Representations of Linear Processes 46
2.6 Weak and Strong Dependence 49
2.7 ARMA Models 51
2.8 Autocovariance Function 56
2.9 ACF and Partial ACF Functions 57
2.10 ARFIMA Processes 64
2.11 Fractional Gaussian Noise 71
2.12 Bibliographic Notes 72

Problems 72

3 State Space Models 89
3.1 Introduction 90
3.2 Linear Dynamical Systems 92
3.3 State space Modeling of Linear Processes 96
3.4 State Estimation 97
3.5 Exogenous Variables 113
3.6 Bibliographic Notes 114

Problems 114

4 Spectral Analysis 121
4.1 Time and Frequency Domains 122
4.2 Linear Filters 122
4.3 Spectral Density 123
4.4 Periodogram 125
4.5 Smoothed Periodogram 128
4.6 Examples 130
4.7 Wavelets 136
4.8 Spectral Representation 138
4.9 Time-Varying Spectrum 140
4.10 Bibliographic Notes 145
Problems 145
5 Estimation Methods 151
5.1 Model Building 152
5.2 Parsimony 152
5.3 Akaike and Schwartz Information Criteria 153
5.4 Estimation of the Mean 153
5.5 Estimation of Autocovariances 154
5.6 Moment Estimation 155
5.7 Maximum-Likelihood Estimation 156
5.8 Whittle Estimation 157
5.9 State Space Estimation 160
5.10 Estimation of Long-Memory Processes 161
5.11 Numerical Experiments 178
5.12 Bayesian Estimation 180
5.13 Statistical Inference 184
5.14 Illustrations 189
5.15 Bibliographic Notes 193
Problems 194
6 Nonlinear Time Series 209
6.1 Introduction 210
6.2 Testing for Linearity 211
6.3 Heteroskedastic Data 212
6.4 ARCH Models 213
6.5 GARCH Models 216
6.6 ARFIMA–GARCH Models 218
6.7 ARCH(1) Models 220
6.8 APARCH Models 222
6.9 Stochastic Volatility 222
6.10 Numerical Experiments 223
6.11 Data Applications 225
6.12 Value at Risk 236
6.13 Autocorrelation of Squares 241
6.14 Threshold autoregressive models 247
6.15 Bibliographic Notes 252
Problems 253
7 Prediction 267
7.1 Optimal Prediction 268
7.2 One-Step Ahead Predictors 268
7.3 Multistep Ahead Predictors 275
7.4 Heteroskedastic Models 276
7.5 Prediction Bands 281
7.6 Data Application 287
7.7 Bibliographic Notes 289
Problems 289
8 Nonstationary Processes 295
8.1 Introduction 296
8.2 Unit Root Testing 297
8.3 ARIMA Processes 298
8.4 Locally Stationary Processes 301
8.5 Structural Breaks 326
8.6 Bibliographic Notes 331
Problems 332
9 Seasonality 337
9.1 SARIMA Models 338
9.2 SARFIMA Models 351
9.3 GARMA Models 353
9.4 Calculation of the Asymptotic Variance 355
12.6 Bibliographic Notes 483
Problems 483
Appendix A: Complements 487
A.1 Projection Theorem 488
A.2 Wold Decomposition 490
A.3 Bibliographic Notes 497
Appendix B: Solutions to Selected Problems 499
Appendix C: Data and Codes 557
References 559
Topic Index 573
Author Index 577

Order by Fax - using the form below
Order by Post - print the order form below and send to

Research and Markets,
Guinness Centre,
Taylors Lane,
Dublin 8,
Ireland.
Fax Order Form
To place an order via fax simply print this form, fill in the information below and fax the completed form to 646-607-1907 (from USA) or +353-1-481-1716 (from Rest of World). If you have any questions please visit http://www.researchandmarkets.com/contact/

Order Information
Please verify that the product information is correct.

- Product Name: Time Series Analysis. Wiley Series in Probability and Statistics
- Web Address: http://www.researchandmarkets.com/reports/3327612/
- Office Code: SCH3JXT1

Product Format
Please select the product format and quantity you require:

<table>
<thead>
<tr>
<th>Quantity</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Hard Copy (Hard Back):</td>
<td>USD 124 + USD 29 Shipping/Handling</td>
</tr>
</tbody>
</table>

* Shipping/Handling is only charged once per order.

Contact Information
Please enter all the information below in BLOCK CAPITALS

<table>
<thead>
<tr>
<th>Title:</th>
<th>Mr</th>
<th>Mrs</th>
<th>Dr</th>
<th>Miss</th>
<th>Ms</th>
<th>Prof</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Name:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Last Name:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Email Address:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Job Title:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Organisation:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Address:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>City:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Postal / Zip Code:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Country:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Phone Number:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fax Number:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Please refrain from using free email accounts when ordering (e.g. Yahoo, Hotmail, AOL)
Payment Information

Please indicate the payment method you would like to use by selecting the appropriate box.

☐ Pay by credit card: You will receive an email with a link to a secure webpage to enter your credit card details.

☐ Pay by check: Please post the check, accompanied by this form, to:
Research and Markets,
Guinness Center,
Taylors Lane,
Dublin 8,
Ireland.

☐ Pay by wire transfer: Please transfer funds to:
- Account number: 833 130 83
- Sort code: 98-53-30
- Swift code: ULSBIE2D
- IBAN number: IE78ULSB98533083313083
- Bank Address: Ulster Bank,
  27-35 Main Street,
  Blackrock,
  Co. Dublin,
  Ireland.

If you have a Marketing Code please enter it below:

Marketing Code: ________________________________

Please note that by ordering from Research and Markets you are agreeing to our Terms and Conditions at http://www.researchandmarkets.com/info/terms.asp