Time Series Models for Business and Economic Forecasting

With a new author team contributing decades of practical experience, this fully updated and thoroughly classroom-tested second edition textbook prepares students and practitioners to create effective forecasting models and master the techniques of time series analysis. Taking a practical and example-driven approach, this textbook summarizes the most critical decisions, techniques, and steps involved in creating forecasting models for business and economics. Students are led through the process with an entirely new set of carefully developed theoretical and practical exercises. Chapters examine the key features of economic time series, univariate time series analysis, trends, seasonality, aberrant observations, conditional heteroskedasticity and ARCH models, non-linearity and multivariate time series, making this a complete practical guide. A companion website with downloadable datasets, solutions to exercises and lecture slides rounds out the full learning package.

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Time Series Models for Business and Economic Forecasting
SECOND EDITION

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## Contents

List of figures ................................................................. vii
List of tables ................................................................. v
Preface ............................................................................ xi

1 Introduction and overview ................................................. 1

2 Key features of economic time series ................................. 8

2.1 Trends ................................................................. 9
2.2 Seasonality ........................................................... 14
2.3 Aberrant observations .................................................. 22
2.4 Conditional heteroskedasticity ....................................... 26
2.5 Non-linearity ........................................................... 27
2.6 Common features ...................................................... 29

3 Useful concepts in univariate time series analysis ................. 33

3.1 Autoregressive moving average models ............................ 35
3.2 Autocorrelation and identification ................................... 45
3.3 Estimation and diagnostic measures ................................ 58
3.4 Model selection ........................................................ 65
3.5 Forecasting ............................................................. 66

4 Trends ........................................................................... 77

4.1 Modeling trends ......................................................... 79
4.2 Unit root tests .......................................................... 94
4.3 Stationarity tests ....................................................... 102
4.4 Forecasting .............................................................. 104

5 Seasonality ..................................................................... 110

5.1 Modeling seasonality ................................................... 112
## Contents

5.2 Seasonal unit root tests 124  
5.3 Forecasting 131  

6 Aberrant observations 139  
  6.1 Modeling aberrant observations 144  
  6.2 What happens if we neglect outliers? 152  
  6.3 What to do about outliers? 154  
  6.4 Outliers and unit root tests 160  

7 Conditional heteroskedasticity 166  
  7.1 Models for conditional heteroskedasticity 169  
  7.2 Various extensions 176  
  7.3 Specification, estimation and evaluation 183  
  7.4 Forecasting 194  

8 Non-linearity 205  
  8.1 Regime-switching models 206  
  8.2 Estimation 212  
  8.3 Testing for nonlinearity 220  
  8.4 Diagnostic checking 227  
  8.5 Forecasting 232  

9 Multivariate time series 240  
  9.1 Representations 244  
  9.2 Empirical model building 252  
  9.3 Applying VAR models 256  
  9.4 Cointegration: some preliminaries 262  
  9.5 Inference on cointegration 269  

Bibliography 284  
Subject index 298
Figures

2.1 Annual indices of log real GDP per capita in Latin American countries  page 9
2.2 Annual stock of motorcycles in The Netherlands  12
2.3 Quarterly index of US industrial production  13
2.4 Monthly US new passenger car registrations  14
2.5 Quarterly growth rates of US industrial production  15
2.6 Vector-of-quarters representation of quarterly US industrial production  16
2.7 Changing seasonality in US industrial production  17
2.8 Quarterly UK household final consumption expenditures  18
2.9 Quarterly growth rates of UK household final consumption expenditures  19
2.10 Vector-of-quarters representation of quarterly UK household final consumption expenditures  19
2.11 Changing seasonality in UK household consumption  20
2.12 Four-weekly advertising expenditures on radio and television in The Netherlands  21
2.13 Changing seasonality in television advertising expenditures  21
2.14 Monthly revenue passenger-kilometers flown for European airlines  23
2.15 Annual growth rates of revenue passenger-kilometers flown for European airlines  24
2.16 Monthly growth rates of revenue passenger-kilometers flown for European airlines  25
2.17 Monthly growth rates of revenue passenger-kilometers flown for European airlines  25
2.18 Daily returns on the Dow Jones index  26
2.19 Quarterly US unemployment rate among men of 16 years and over  28
2.20 Monthly log prices of gold and silver  31
2.21 Daily returns of gold and silver  31
3.1 Simulated AR(1) time series  38
3.2 Simulated MA(1) time series  43
3.3 Theoretical autocorrelation function of an AR(2) process  49
3.4 Theoretical autocorrelation function of an AR(2) process  50
## List of figures

<table>
<thead>
<tr>
<th>Figure</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.5</td>
<td>Theoretical autocorrelation function of an AR(2) process</td>
<td>51</td>
</tr>
<tr>
<td>3.6</td>
<td>Theoretical autocorrelation function of an AR(2) process</td>
<td>52</td>
</tr>
<tr>
<td>3.7</td>
<td>Empirical autocorrelation function of annual differences of log monthly US industrial production</td>
<td>56</td>
</tr>
<tr>
<td>3.8</td>
<td>Typical fit of an AR time series model</td>
<td>60</td>
</tr>
<tr>
<td>4.1</td>
<td>Simulated time series from deterministic trend and stochastic trend models</td>
<td>82</td>
</tr>
<tr>
<td>4.2</td>
<td>Results of a regression of US industrial production on a constant and a linear deterministic trend</td>
<td>83</td>
</tr>
<tr>
<td>4.3</td>
<td>Results of a regression of stock of motorcycles on a quadratic deterministic trend</td>
<td>86</td>
</tr>
<tr>
<td>4.4</td>
<td>Partial sums of residuals for Latin American GDP per capita</td>
<td>87</td>
</tr>
<tr>
<td>4.5</td>
<td>Example of a Gompertz curve and a logistic curve</td>
<td>88</td>
</tr>
<tr>
<td>4.6</td>
<td>Empirical autocorrelation function for absolute daily gold returns</td>
<td>93</td>
</tr>
<tr>
<td>4.7</td>
<td>Point forecasts and 95% interval forecasts from an AR(2) model for US industrial production</td>
<td>107</td>
</tr>
<tr>
<td>4.8</td>
<td>Point forecasts and 95% interval forecasts from an ARI(1,1) model for US industrial production</td>
<td>107</td>
</tr>
<tr>
<td>5.1</td>
<td>Results of a regression of quarterly UK household consumption on an intercept and a linear deterministic trend</td>
<td>112</td>
</tr>
<tr>
<td>5.2</td>
<td>Vector-of-quarters plot of deviations from linear trend of UK household consumption</td>
<td>113</td>
</tr>
<tr>
<td>5.3</td>
<td>Simulated quarterly seasonal random walk and transformations</td>
<td>119</td>
</tr>
<tr>
<td>5.4</td>
<td>Vector-of-quarters plot of simulated seasonal random walk</td>
<td>120</td>
</tr>
<tr>
<td>6.1</td>
<td>Quarterly log industrial production France</td>
<td>140</td>
</tr>
<tr>
<td>6.2</td>
<td>Quarterly growth rates of industrial production France</td>
<td>140</td>
</tr>
<tr>
<td>6.3</td>
<td>Daily returns on the Dow Jones index</td>
<td>141</td>
</tr>
<tr>
<td>6.4</td>
<td>Daily returns on the Dow Jones index, September 1–December 31, 1987</td>
<td>141</td>
</tr>
<tr>
<td>6.5</td>
<td>Example of an additive outlier</td>
<td>146</td>
</tr>
<tr>
<td>6.6</td>
<td>Example of an additive outlier</td>
<td>146</td>
</tr>
<tr>
<td>6.7</td>
<td>Effect of neglecting a single additive outlier on residuals of AR(1) model</td>
<td>147</td>
</tr>
<tr>
<td>6.8</td>
<td>Example of an innovation outlier</td>
<td>149</td>
</tr>
<tr>
<td>6.9</td>
<td>Example of an innovation outlier</td>
<td>149</td>
</tr>
<tr>
<td>6.10</td>
<td>Effect of neglecting a single innovation outlier on residuals of AR(1) model</td>
<td>150</td>
</tr>
<tr>
<td>6.11</td>
<td>Example of a level shift</td>
<td>152</td>
</tr>
<tr>
<td>6.12</td>
<td>Huber weight function</td>
<td>157</td>
</tr>
</tbody>
</table>
List of figures

6.13 Quarterly (log) US manufacturers’ new orders for non-defense capital goods 159
6.14 Results from an AR(3) model for US manufacturers’ new orders for non-defense capital goods 159
7.1 QQ-plot of daily returns on the Dow Jones index 167
7.2 Daily returns on the Dow Jones index, July 1, 1998–December 31, 1998 168
7.3 Scatter of daily returns on the Dow Jones index, July 1, 1998–December 31, 1998 169
7.4 Empirical autocorrelation function of daily returns, squared returns, and absolute returns on the Dow Jones index 170
7.5 News impact curves from the GARCH(1,1), EGARCH(1,1) and TGARCH(1,1) models 181
7.6 Daily MSCI Switzerland returns 190
7.7 Empirical ACF and ACF implied by the GARCH(1,1) model of squared daily MSCI Switzerland returns 191
7.8 Conditional standard deviation from GARCH(1,1) model for daily returns on the MSCI Switzerland index 192
7.9 Empirical ACF of (squared) residuals for an ARCH(1) and GARCH(1,1) model for daily returns on the MSCI Switzerland index 192
7.10 Conditional standard deviation from GARCH(1,1) and TGARCH(1,1) models for daily returns on the MSCI Switzerland index 193
7.11 One-step ahead forecasts of conditional standard deviation from TGARCH(1,1) models for daily returns on MSCI Switzerland 199
7.12 One-step ahead 95% interval forecasts from TGARCH(1,1) models for daily returns on MSCI Switzerland 199
8.1 Logistic functions 208
8.2 Quarterly seasonally adjusted US unemployment rates 224
8.3 Sequence of Wald statistics for testing threshold nonlinearity in US unemployment rates 225
8.4 Transition function in LSTAR model for quarterly seasonally adjusted US unemployment rate 226
9.1 Impulse response function with 95% confidence bounds 260
9.2 Simulated cointegrated time series 264
9.3 Monthly white and black pepper price series 274
9.4 Cointegration relation between the logarithm of white and black pepper prices 276
### Tables

2.1 Trends in real GDP per capita in Latin American countries 10  
2.2 Trends in US industrial production 13  
3.1 Empirical (partial) autocorrelation functions for monthly revenue-passenger kilometers of European airlines 57  
4.1 Critical values for tests to select between deterministic trend and stochastic trend models 96  
4.2 Testing for unit roots: some empirical examples 101  
4.3 Forecast standard errors for the stock of motorcycles 106  
5.1 Empirical autocorrelation functions of UK consumption 116  
5.2 Critical values for HEGY seasonal unit root tests in quarterly time series 129  
5.3 Testing for seasonal unit roots: some empirical examples 130  
6.1 Asymptotic critical values of Dickey-Fuller $t$-test in the presence of level shifts and breaking trends at a known date 162  
6.2 Asymptotic critical values of HEGY test statistics in the presence of seasonal level shifts at known break date 164  
9.1 VAR model selection for gold and silver prices 254  
9.2 Variance decomposition in VAR(2) model for gold and silver prices 261  
9.3 Asymptotic critical values for the Engle and Granger (1987) cointegration method 265  
9.4 Asymptotic critical values for the Johansen cointegration method 272  
9.5 Empirical (partial) autocorrelation functions for the cointegration variable of white and black pepper prices 275  
9.6 Asymptotic critical values for the cointegration test based on a conditional error correction model 278
Preface

The econometric analysis of economic and business time series is a major field of research and application. The last few decades have witnessed an increasing interest in both theoretical and empirical developments in constructing time series models and in their important application in forecasting. This book aims at reviewing several important developments within the context of forecasting business and economic time series.

A full-blown textbook on all aspects of time series analysis will cover thousands of pages. For example, the field of unit root analysis has expanded in the last three decades with such a pace and variation that a book only on this topic would take more pages than the current book does. This book is therefore not intended to be a survey of all that is available and that can be done in time series analysis. Obviously, such a selection comes with a cost, that is, the discussion will sometimes not be as theoretically precise as some readers would have liked. Merely, it is our purpose that the readers should be able to generate their own forecasts from time series models that adequately describe the key features of the data, to evaluate these forecasts and to come up with suggestions for possible modifications if necessary. In some interesting cases, though, we also recommend further reading. To attain this, we make a selection between all the possible routes to constructing and evaluating time series models, between all the possible estimation methods, and between all the various tests that can be used. Basically, our choice is also motivated by the availability of methods in such statistical packages as Eviews, while sometimes a little bit of Gauss, R or Matlab programming is needed. In fact, all empirical results in this book are thus obtained. An additional motivation for our choice is given by our own practical experience in forecasting business and economic time series. This experience is also based on supervising projects of our econometrics undergraduate students during their internships at banks, investment companies, and consultancy agencies.

Preface

It is hoped that the reader finds the material in this book helpful to understand why such new methods can be useful for forecasting.

Although this book amounts to an introduction to the field of time series analysis and forecasting, it is necessary that the reader has knowledge of introductory econometrics. Specifically, regression analysis, matrix algebra and various concepts in estimation should be included in that knowledge. This book should then be useful to advanced undergraduate students and graduate students in business and economics, but also to practitioners and applied economists who wish to obtain a first, but not too technical, impression of time series forecasting. In fact, most of the material has already been used in “Time Series Analysis” courses for third year undergraduate students at the Econometric Institute in Rotterdam ever since 1996.

The first edition of this book (Franses (1998)) contained material that has now been deleted. Periodic models for seasonal data are not included anymore and also an extensive discussion of common features has been deleted. On the other hand, more details on ARCH models and on non-linear models have been included, where we draw from the material in a 2000 Cambridge University Press textbook by the first two authors. More importantly, this fully revised second edition contains exercises. Answers to selected exercises will be made available on a special website. These exercises match with those presented at past exams to our students.

This book was written during our affiliation with the Econometric Institute at the Erasmus University Rotterdam. This Institute is a very stimulating teaching and research environment. We wish to express our gratitude to our (then) colleagues Teun Kloek, Christiaan Heij, Herman van Dijk, Dennis Fok, Richard Paap, Andre Lucas, Marius Ooms and anonymous reviewers for their kind willingness to comment on some or all chapters.

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