

Book Review

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Kommerzielle Verwendung der Daten,
auch über elektronische Medien,
nur mit Genehmigung des ifo Instituts.

Book Review

Winfried Stier (2001), *Methoden der Zeitreihenanalyse*, Heidelberg et al.: Springer.

It's an easy task to fill the reading list for a course in time series analysis with many excellent books and surveys. For this reasons, one is somewhat sceptical whether there exists really a market for an additional textbook. The author has to find a new perspective which distinguishes his work from that of competitors. The concept of Stier is to present a broad spectrum of models and methods from an applications-oriented viewpoint without falling in the trap of writing a mere collection of recipes. Though, there are a couple of books which go in this direction, the present textbook deals with a broad range of topics which are discussed only in specialised books. It is, therefore, a useful source of information for practitioners and students.

The first four chapters deal with descriptive methods for the seasonal adjustment of a time series and with exponential-smoothing algorithms. This approach has the advantage that the reader is confronted from the outset with practical applications of time series methods but implies also that some results (e.g. the recursion formula in chapter IV) are presented without any explanatory statements. A further disadvantage is that the structure of the book becomes somewhat badly arranged. For instance, both chapter II and chapter XV are dealing with problems of seasonal adjustment. And in chapter XV, there is an intensive use of filter concepts which are, however, discussed in greater detail not before chapter XVI.

The following chapters discuss the properties of uni- and multivariate stochastic processes as well as the estimation of the model parameters. The presentation is relatively short and abstains largely from formal proofs and derivations but contains in most cases all necessary steps for understanding the logic of the argument. A somewhat problematical feature is the ad-hoc differencing of time series with seasonal and trend components even though a more explicit analysis of unit roots is not found until chapter XVII. This implies, for instance, that the variances of prediction errors for integrated processes are presented in a clear manner only for the first differences whereas the implications for the prediction of the level remain vague.

The identification of stochastic processes and the problems concerning model diagnostics are dealt with in chapters VIII and IX, chapter X is devoted to the important but mostly neglected problem of outliers in time series. As in all other chapters of the book, most approaches are illustrated by using real world applications.

Structural time series models are presented in chapter XIII. Structural time series models decompose a time series in unobserved trend, cycle and season components. The components are specified as stochastic processes, the total model is estimated using the Kalman filter. Despite some typos (e.g. λ_Z instead of λ_C in the second equation on page 163) and some not quite correct statements (the recursion equation at the top of

page 163 is not equivalent to the definition of the cycle on page 162, since the latter implies a deterministic cycle whereas the recursion allows for a stochastic cycle with time varying phase and amplitude), this chapter is a very nice and useful introduction to the field of structural time series models.

After an introduction to spectral analysis in chapter XIV, the following chapter XV deals in a very clear manner with theoretical and practical problems of seasonal adjustment. All important methods (especially the Census- and Berliner approach as well as TRAMO-SEATS) are presented and discussed.

The two subsequent chapters present the theoretical basis and construction methods for digital filters. These chapters are the most demanding in the book and many students will have difficulties to understand fully the material without the help of the instructor. An appendix with the formula for dealing with trigonometric expressions and complex numbers should be useful. In addition, at least for economists, it would be interesting if some filters were discussed which play an important role in empirical economics (e.g. the Hodrick-Prescott- and the Baxter-King-filter). The HP-filter is mentioned but not under this name and only in the context of seasonal adjustment procedures. It would be very useful if the author had discussed whether so called "ideal" filters are compatible with the ideas underlying stochastic component models. The spectrum of a stochastic cycle, for instance, has its maximum at cyclical frequencies but the spectral density is in many cases positive over all frequencies. A filter which allows to pass only part of fluctuations (within a certain band of "cyclical" frequencies) will probably produce very unsatisfactory results (for example spurious cycles).

Chapters XVIII and XIX deal with the most important concepts of integrated and co-integrated stochastic processes and some tests designed for detection of unit roots. The treatment of seasonal unit roots is very short and a discussion of the econometrics of $I(2)$ -variables or the co-integration analysis of seasonal time series is totally missing.

The last chapter provides an instructive survey on non-linear time series models, especially ARCH- and Threshold-models. Of course, it is impossible to present all approaches but at least a short discussion of Markov switching-regime-models (used intensively in business cycle research) would have been useful.

It seems that this book is a particularly suitable reading for students and practitioners who are already acquainted with the basic principles of time series analysis and who want to read a survey on new developments in the theory and practice of time series econometrics. If one wants to know how statistical agencies carry out seasonal adjustment one is very well served by reading the relevant chapters of this book. The book could gain even more in importance when some of the topics mentioned above were dealt with. Some concrete information about suitable software would also be useful.

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