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Analysis of time varying parameter models

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This thesis is concerned with the analysis of some aspects of time varying parameter models. In Chapter 1 we introduce a model upon which we mainly concentrate ourselves in this thesis. The model, often referred to as a state space system, is such that the observable process is made up additively of two unobservable variables, signal - a known linear transformation of a state vector generated by an autoregressive process - and white noise. Although it is well known that the optimal estimate of the state vector can be obtained at each time by a Kalman filter, this is possible only when a finite number of parameters involved in the model are all known.

Chapters 2 and 3 consider the identification and estimation of these parameters for this model. We extensively discuss the case where the observable process is stationary, which will become important when considering seasonal adjustment procedures in Chapter 4. The laws of large numbers and the central limit theorems are proved for the estimators suggested.

The role of the time varying parameter model under consideration is twofold; on one hand it is an extension of the usual linear regression model and on the other hand it is regarded as a signal plus noise model. Chapter 4 emphasizes the latter interpretation and we apply the estimation procedure discussed in Chapter 3 to a changing seasonal plus noise model while Chapter 5 considers hypothesis testing for the constancy of the coefficient parameters in the usual linear regression models with the time

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varying parameter model as an alternative.

The last two chapters deal with possible extensions of previous chapters. In Chapter 6 the Kalman filter is adapted to general time series models and in Chapter 7 signal plus noise models contaminated with transients are analyzed.

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