A Dynamic Factor Model for Economic Time Series.

F. Javier Fernández-Macho

Abstract: A dynamic factor model is introduced which may be viewed as an alternative to vector autoregressions in the treatment of cointegration. An obvious way of introducing dynamics in the standard factor analysis is to allow a realization of the common factors at a specific time interval to work its way through to the observed variables in several time periods. A problem arises however, when representing economic time series which generally are nonstationary. In this paper the dynamic factor model considered can handle nonstationarity rather trivially *via* unobserved factors with unit roots. The stochastic behaviour of these factors is explicitly modeled, and therefore the model is a member of the multivariate structural time series model class. A situation in which we might wish to entertain such a model is when considering two or more related economic variables which, as is often the case, appear to exhibit a common trend and hence are cointegrated. The paper investigates the maximum likelihood estimation in the frequency domain and a scoring algorithm is provided. Also a generalization is considered in which independent common factors are made up of stochastic trends with stochastic common slopes and stochastic seasonals.