

Abstract:

Measurement of air pollution has become an important issue since it has been established that air quality is closely connected to human health and environment. International organizations as well as local authorities are particularly concerned with air pollution, but, in spite of the huge amount of data on various pollutants recorded frequently at the monitoring sites located in many countries all over the world, the problem of properly synthesizing the available information is still a matter of discussion in the specialized literature. In this paper we present an explicit dynamic time series factor model that implicitly determines a variable which can be thought of as measuring the state of local air pollution. With the suggested operative approach, we aim to contribute to measuring air quality, by proposing a methodological procedure leading to the estimation of a single site indicator determined jointly by present and past pollution as well as by the meteorological conditions. These single indicators are then spatially aggregated using principal component analysis. The advantage of using this dynamic factor model for the empirical analysis is that, besides measuring air pollution, we can use the estimated model for forecasting future air pollution, given the meteorological predictions. The application of the model in the present paper considers a pollution data set collected at different monitoring sites in the alpine province of Trento.