

Local Atmospheric Pollution Evolution through Time Series Analysis

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The monitoring and improvement of air quality are fundamental issues, given the possible effects of air pollution on human health. The analysis, in an Alpine Italian province, of the dynamic pattern of mutual relations among air pollutants is the main aim of the present study. In particular, the interest is the proposal of a procedure that can be used to analyse the pollution level trend and not the suggestion of a strategy for the construction of another synthetic air quality index. In our study we haven't taken into consideration the possible effects on pollution of meteorological covariates, because we are not actually analysing how climate changes influence the level of pollution, because they are not mainly under control. We are just analysing how pollution has evolved because of best practises introduced by law. The procedure is: first, the estimation of an unobserved common component that we consider a pollution indicator and, then, the analysis of the component evolution in order to assess whether any improvement in the pollution level has been observed during the last decade. The empirical analysis is conducted through a dynamic multiple time series model with a common autoregressive stochastic factor. As well as any other synthetic index, the proposed indicator summarises a complex situation in a single variable whose evolution can be compared in time and in space. The results we have obtained show that some improvement in the level of air pollution has been achieved, especially in the most recent years.

Key Words: air quality, air pollutants, dynamic-factor model, unobserved common factor, double-exponential smoothing