

Forecasting of a hierarchical functional time series on example of macromodel for day and night air pollution in Silesia region – a critical overview

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Abstract

In economics we often face a system, which intrinsically imposes a structure of hierarchy of its components, i.e., in modelling trade accounts related to foreign exchange or in optimization of regional air protection policy. A problem of reconciliation of forecasts obtained on different levels of hierarchy has been addressed in the statistical literature (see [1,2,3]) and concerns bringing together forecasts obtained at different levels of hierarchy. In our paper we are dealing with hierarchical functional time series. We present and critically discuss the state of the art and indicate opportunities of an application of these methods. We critically compare the best predictor known from the literature with our own original proposal. Within the paper we study a macromodel describing a day and night air pollution in Silesia region divided into five subregions.

keywords: hierarchical time series, reconciliation of forecasts, functional data analysis, grouped functional time series, functional median, day and night air pollution

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