Institut für Arbeitsmarkt- und Berufsforschung

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Invitation

Optimal prediction with hierarchically constrained forecast combinations

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In this paper, we develop a new approach to combine disaggregated forecasts optimally at different levels in a system of hierarchically constrained forecasts. We start in a situation where arrays of forecasts for micro and intermediate-level variables achieved with different estimation models need to be combined to a single prediction for each of the variables, and variables at intermediate levels need to be aggregated from the micro level at the same time. Using a regression-based optimal pooling approach, we simultaneously estimate the model weights at the micro and intermediate levels, whereby cross-equation constraints guarantee hierarchical consistency. The model-specific weights are determined so as to minimise (the sum of) mean-square losses over the history of forecasts subject to the constraints. This is an advantage compared to the current state of methods to achieve hierarchical consistency which so far do not take past forecasts accuracy at different levels into consideration.

In a first application, we use data on employment and unemployment developments in Germany at 4 different levels of regional disaggregation and for two subpopulations. All levels are forecasted by up to eight different time-series models. We evaluate the accuracy of forecast combinations under hierarchical consistency and compare it with combinations under additional restrictions and with alternative methods to ensure hierarchical consistency.

Tuesday, April 14, 2015

10.00 o'clock

Room **126a**