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Forecast uncertainty and resampling techniques

For forecasts to be truly useful, the forecaster should report not only the future outcomes but also their associated probabilities of occurrence. Probability forecasts provide a measurement of the inherent uncertainty of future events, and so they are relevant for many decision-making processes such as sales forecasts, economic growth forecasts, and wind power forecasts. For example, some research suggests that people make better weather-related decision when they are given numerical probabilities for critical outcomes. In spite of its relevance, the literature on probability forecasts is rather sparse but clearly growing. Often one needs to make strong assumptions about the model, its parameters, and the distribution of the errors to obtain forecasts with their associated probabilities. Alternatively, resampling techniques can provide probability forecasts under weaker and more realistic assumptions. In the context of model-based forecasts, we will revise the latest developments in resampling techniques to measure forecast uncertainty and to obtain forecast probabilities. We will also discuss a variety of issues such as conditional or unconditional forecasts, the forecast horizon, and the type of data and model used to produce the forecasts.