2

* For „normal“ time-series
* Forecast the first point out-of-sample and add a random draw from the residuals as error
* Make the next forecast, given the last predicted point that includes the random error
* Add a random error again
* To this x times for the whole forecasting horizon
* Retrieve many possible futures
* Take the x% interval of these futures
* Can also be done with errors drawn from a normal (or any other distribution)

9

* Forecasting methods: Fan charts, density forecasts, probabilistic directional forecasts, prediction interval

10

* Methods to derive prediction intervals 665
  + Theoretical: “derive prediction intervals […] objectively from the underlying model assumptions (plus an appeal to the normal distribution of errors)”
  + Empirical: “derived from an actual or simulated distribution of prediction errors for a specific forecast horizon”

14

* “evaluate the finite sample performance of the empirical prediction intervals using Monte Carlo experiments”
* Address theoretic approach and implement empirical approach (parametric and non-parametric)

20

* Construct intervals with machine learning (Extreme Learning Machine ELM)

21

* Calculates mean and variance for the whole group of customers but not on individual level

Use Cross Validation

24PI

* PREDICTION INTERVALS FOR SUMMED TOTALS

10

* Methods to derive prediction intervals 665
  + Theoretical: “derive prediction intervals […] objectively from the underlying model assumptions (plus an appeal to the normal distribution of errors)”
  + Empirical: “derived from an actual or simulated distribution of prediction errors for a specific forecast horizon”

14

* “evaluate the finite sample performance of the empirical prediction intervals using Monte Carlo experiments”
* Address theoretic approach and implement empirical approach (parametric and non-parametric)

33

* Present several methods for regression, partly applicable for time-series or CLV estimation
* Bayes methods: Updating the model parameter and prediction after seeing a new value
* Ensembles: Have x models that predict a value, calculate the mean and variance of these values, assume a normal distribution and form this, construct a prediction interval
* Direct interval estimation methods: Do sometimes not produce point forecasts at all but only intervals, like quantile regression
* Conformal prediction