

Forecast uncertainty, its representation and evaluation

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0 Introduction

Overview of the issues to be addressed in a simple example – Wold representation of a purely non-deterministic stationary stochastic process

1 Measuring and reporting forecast uncertainty

Sources of error in econometric model-based forecasts

Calculation of measures of forecast uncertainty (expected forecast dispersion):

- model-based: variance formulae, simulation methods, model uncertainty
- empirical: forecast MSE, MAE, choice between them, adjustment for breaks

Reporting forecast uncertainty:

- interval forecasts (\pm MSE, \pm MAE), probability statements, central intervals, shortest intervals, distributional assumptions
- density forecasts (histograms, fan charts)
- event probability forecasts
- forecast scenarios, the role of judgement

Decision theory considerations

Survey forecasts, disagreement and uncertainty

2 Evaluating interval and density forecasts

Economic value, statistical performance

Goodness-of-fit tests: likelihood ratio tests, Pearson's chi-squared test, probability integral transformation, inverse normal transformation, Kolmogorov-Smirnov test, moment-based tests

3 Applications (referred to recurrently)

Bank of England inflation forecasts, Survey of Professional Forecasters, US CBO budget projections, GLPS model-based forecasts

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Note: this list consists mostly of research articles, and does not include background material in statistics, econometrics, and associated mathematical methods.