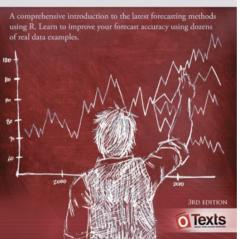
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FORECASTING PRINCIPLES AND PRACTICE



5. The forecaster's toolbox

5.3 Fitted values and residuals
OTexts.org/fpp3/

Fitted values

- $\hat{y}_{t|t-1}$ is the forecast of y_t based on observations y_1, \dots, y_{t-1} .
- We call these "fitted values".
- Sometimes drop the subscript: $\hat{y}_t \equiv \hat{y}_{t|t-1}$.
- Often not true forecasts since parameters are estimated on all data.

For example:

- $\hat{y}_t = \bar{y}$ for average method.
- $\hat{y}_t = y_{t-1} + (y_T y_1)/(T 1)$ for drift method.

Forecasting residuals

Residuals in forecasting: difference between observed value and its

fitted value: $e_t = y_t - \hat{y}_{t|t-1}$.

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- $\{e_t\}$ have mean zero. If they don't, then forecasts are biased.

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Useful properties (for distributions & prediction intervals)

- ${\bf e}_t$ have constant variance.
- $\{e_t\}$ are normally distributed.