

pseudo__novelist__cv

Vincent Su

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Procedure:

Preliminary

- Fit the model on (y_1, \dots, y_T) for each of the p time series.
- Compute in-sample 1-step-ahead forecast errors $\hat{e}_{t|t-1}$ for $t = 2, 3, \dots, T$

(in case such as AR(2) should we exclude the first 2 obs?)

Algorithm

Input: matrices $\mathbf{y}_t, \hat{\mathbf{e}}_{t|t-1} \in \mathbb{R}^{T-1 \times p}$

Output: optimal NOVELIST matrix $\hat{W}_1^* \in \mathbb{R}^{p \times p}$, threshold scalar δ^*

for $i = n : T - 1$ do

 Training set = $\{\hat{\mathbf{e}}_{t|t-1} : t = i - n + 1, \dots, i\}$

 for $\delta = 0 : 1$ by x step do

 Compute \hat{R}_i using training set

 Compute thresholded $\hat{R}_{i,\delta}$

 Compute $\lambda_{i,\delta}$ using $\hat{R}_{i,\delta}$

$\hat{R}_{i,\delta}^N \leftarrow \lambda_{i,\delta} \hat{R}_{i,\delta} + (1 - \lambda_{i,\delta}) \hat{R}_i$

$\hat{W}_{i,\delta}^N \leftarrow \hat{D}^{1/2} \hat{R}_{i,\delta}^N \hat{D}^{1/2}$

 Compute 1-step-ahead reconciled forecasts $\tilde{\mathbf{y}}_{i+1,\delta}$

$\tilde{\mathbf{e}}_{i+1,\delta} \leftarrow \mathbf{y}_{i+1} - \tilde{\mathbf{y}}_{i+1,\delta}$

 end

end

$\bar{\mathbf{e}}_\delta \leftarrow \text{mean}(\tilde{\mathbf{e}}_{i+1,\delta}), \text{ for } i = n : T - 1$

$\delta^* \leftarrow \arg \min_{\delta \in \{0, x, 2x, \dots, 1\}} \bar{\mathbf{e}}_\delta$

Compute λ^* using δ^* on all training data

Compute \hat{W}_1^* using δ^* and λ^* on all training data

Return δ^*, \hat{W}_1^*