Forecast reconciliation

2. The geometry of forecast reconciliation

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Outline

Notation reminder

- Data: $\boldsymbol{y}_t = \boldsymbol{S}\boldsymbol{b}_t$ where $\boldsymbol{S}$ is a summing matrix and $\boldsymbol{b}_t$ is a vector of disaggregated time series
- Base forecasts: $\hat{\boldsymbol{y}}_{T+h|T}$
- Reconciled forecasts: $\tilde{\boldsymbol{y}}_{T+h|T} = \boldsymbol{S}\boldsymbol{G}\hat{\boldsymbol{y}}_{T+h|T}$
- MinT: $\boldsymbol{G} = (\boldsymbol{S}'\boldsymbol{W}_h^{-1}\boldsymbol{S})^{-1}\boldsymbol{S}'\boldsymbol{W}_h^{-1}$ where $\boldsymbol{W}_h$ is covariance matrix of base forecast errors.

Zero-constraint representation

The coherent subspaces

Least squares reconciliation of data

Game theory perspectives

Adding optimization constraints

ML and regularization

Bayesian versions

In-built coherence

References

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References

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