Notes

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Summer 2020

Notation

- N number of time series
- T length of time series
- y_t N×1 vector of observation at **t**
- f_t q×1 factor at **t**
- B $N \times q$ loading matrix

Method

PCA:

$$\operatorname{argmin}_{\mathbf{f_f} \in \mathbb{R}^K} \sum_{t=1}^{T} (\mathbf{y}_t - \mathbf{B}\mathbf{f}_t)' (\mathbf{y}_t - \mathbf{B}\mathbf{f}_t) \tag{1}$$

WPCA:

$$\operatorname{argmin}_{\mathbf{f_f} \in \mathbb{R}^K} \sum_{t=1}^{T} (\mathbf{y}_t - \mathbf{B}\mathbf{f}_t)' \Sigma_u^{-1} (\mathbf{y}_t - \mathbf{B}\mathbf{f}_t) \tag{2}$$

Karlman Filter

Experiment

Cholesky decomposition is not positive definite.

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Error in chol.default(denom) :
  the leading minor of order 71 is not positive definite
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Reference

- Quefeng Li, Guang Cheng, Jianqing Fan & Yuyan Wang (2018) Embracing the Blessing of Dimensionality in Factor Models, Journal of the American Statistical Association, 113:521, 380-389, DOI: 10.1080/01621459.2016.1256815
- Bai, J., and Liao, Y. (2013), "Statistical Inferences Using Large Estimated Covariances for Panel Data and Factor Models," arXiv:1307.2662. [380,381,382,383]