# Forecasts

$$\mathbf{Y}_t = S\mathbf{Y}_{K,t}$$

Let $\hat{\mathbf{Y}}_n(h)$ be vector of independent (base) forecasts for horizon $h$, stacked in same order as $\mathbf{Y}_t$.

Write

$$\hat{\mathbf{Y}}_n(h) = S\boldsymbol{\beta}_n(h) + \boldsymbol{\varepsilon}_h$$

where

- $\boldsymbol{\beta}_n(h) = E[\mathbf{Y}_{K,n+h} \mid \mathbf{Y}_1, \ldots, \mathbf{Y}_n]$ is unknown mean of bottom level $K$
- $\boldsymbol{\varepsilon}_h$ has zero mean and covariance matrix $\Sigma_h$.

**Idea:** Estimate $\boldsymbol{\beta}_n(h)$ using regression.