

$$\hat{\Sigma}_{\chi,t} = \frac{1}{m_t} \begin{bmatrix} \hat{\Sigma}_t & 0 \\ 0 & \frac{\hat{\lambda}_{1,t} \hat{\lambda}_{2,t}}{(\hat{\lambda}_{1,t} - \hat{\lambda}_{2,t})^2} \end{bmatrix} \quad \tilde{\Sigma} \triangleq \int_{[0,1]^d} \tilde{\sigma}(\alpha) \tilde{\sigma}(\alpha)' p_{\alpha}(\alpha) \, \mathrm{d}\alpha. \quad G(\alpha; \tilde{\sigma}) \triangleq \sqrt{\det \left[\frac{\partial \tilde{\sigma}'}{\partial \alpha} \frac{\partial \tilde{\sigma}}{\partial \alpha} \right]}$$

$$\tilde{y} = U(h)'(y - p) \quad [G(\beta; \tilde{\kappa}_i)]_{\beta=\beta_i(\alpha)} = M_i.$$

$$\mu(\mathcal{R}; \tilde{\mathcal{I}}, w) \triangleq \int_{\tilde{\sigma}^{-1}(\mathcal{R} \cap \tilde{\mathcal{I}})} w(\tilde{\sigma}(\alpha)) G(\alpha; \tilde{\sigma}) \, \mathrm{d}\alpha.$$

$$\mathcal{L}\left(\tilde{y}|\tilde{S}\right)=\sum_{i=1}^n\frac{M_i}{M}\int_{[0,1]^d}\gamma\left(\tilde{y},\tilde{\sigma}(\beta)\right)p_{\alpha}\left(\beta_i^{-1}(\beta)\right)\,\mathrm{d}\beta$$

$$\tilde{\kappa}(\alpha;\tilde{S})\triangleq\sum_{i=1}^n1_{\mathcal{A}_i}(\alpha)\,B(\beta_i(\alpha))\tilde{P}_i$$

$$\Delta\Phi(a,b;R)\triangleq\Phi\left(\frac{a'R^{-1}a+b'R^{-1}a}{\sqrt{a'R^{-1}a}}\right)-\Phi\left(\frac{b'R^{-1}a}{\sqrt{a'R^{-1}a}}\right).$$

$$\mathbb{P}(\mathcal{R}; \tilde{\mathcal{I}}, w) \triangleq \frac{\mu(\mathcal{R}; \tilde{\mathcal{I}}, w)}{\mu(\mathbb{R}^2; \tilde{\mathcal{I}}, w)} \cdot \begin{cases} y &= p + U(h) \tilde{\sigma}(\alpha) + v \\ \alpha &\sim p_{\alpha}(\cdot) \\ v &\sim p_v(\cdot) \end{cases} \quad p_{\alpha}(\alpha) = \frac{w(\tilde{\sigma}(\alpha)) G(\alpha; \tilde{\sigma})}{\int_{[0,1]^d} w(\tilde{\sigma}(\beta)) G(\beta; \tilde{\sigma}) \, \mathrm{d}\beta}$$

$$x_{t|t} \triangleq (I - L_t H) x_{t|t-1} + L_k \chi_t$$

$$\mathcal{L}_{i,\mathrm{c}}(\tilde{y}) \triangleq \frac{\mathcal{N}(b_i; 0, R)}{\mathcal{N}\left(\frac{b_i'R^{-1}a_i}{\sqrt{a_i'R^{-1}a_i}}; 0, 1\right)} \frac{\Delta\Phi(a_i, b_i; R)}{\sqrt{a_i'R^{-1}a_i}} \quad P_{t|t} \triangleq (I - L_t H) P_{t|t-1}$$

$$L_t \triangleq P_{t|t-1} H' (H P_{t|t-1} H' + \Sigma_{\chi,t})^{-1}$$

Thank you

“The first principle is that you must not fool yourself,
and you are the easiest person to fool.”
— Richard Feynman