CHAPTER 10

→ Appendix

↳ Basic Forecasting Formula

$$\hat{r} = E\{r\} + Cov\{r, g\} \cdot Var^{-1}\{g\} \cdot (g - E\{g\}) \qquad (10A.1)$$

→ $\hat{r}$ is an unbiased estimate of r

→ If $\{r, g\}$ have a normal distribution, then:

① $\hat{r}$ is the max. likelihood estimate of r given g

↳ Technical treatment of Examples

→ Consider one asset with K forecasts $\quad g = [g_1, g_2, \ldots, g_K]$

$$Var\{g\} = \begin{bmatrix} Std\{g_1\} & & 0 \\ & \ddots & \\ 0 & & Std\{g_K\} \end{bmatrix} \cdot \rho_g \cdot \begin{bmatrix} Std\{g_1\} & & 0 \\ & \ddots & \\ 0 & & Std\{g_K\} \end{bmatrix} \qquad (10A.18)$$

→ Covariance b/w K signals will involve K ICs

$$Cov\{r, g\} = \omega \cdot [IC_1 \ldots IC_K] \cdot \begin{bmatrix} Std\{g_1\} & & 0 \\ & \ddots & \\ 0 & & Std\{g_K\} \end{bmatrix} \qquad (10A.19)$$

→ Input into basic forecasting formula

$$\phi = Cov\{r, g\} \cdot Var^{-1}\{g\} \cdot (g - E\{g\})$$

$$= \omega \cdot [IC_1 \ldots IC_K] \cdot \rho_g^{-1} \cdot \begin{bmatrix} \frac{1}{Std\{g_1\}} & & 0 \\ & \ddots & \\ 0 & & \frac{1}{Std\{g_K\}} \end{bmatrix} \cdot \begin{bmatrix} g_1 - E\{g_1\} \\ \vdots \\ g_K - E\{g_K\} \end{bmatrix} \qquad (10A.20)$$

simplifies to:

$$\phi = \omega \cdot IC^T \cdot \rho_g^{-1} \cdot z \qquad (10A.21)$$

where $\quad z_j = (g_j - E\{g_j\}) \cdot Std^{-1}\{g_j\}$