

$$\hat{\phi} = \begin{bmatrix} \hat{\phi}_{BH} & \hat{\phi}_{BT} \\ \hat{\phi}_{FH} & \hat{\phi}_{FT} \end{bmatrix} = \begin{bmatrix} \frac{4}{4+1} & \frac{1}{4+1} \\ \frac{2}{2+4} & \frac{4}{2+4} \end{bmatrix} = \begin{bmatrix} \frac{4}{5} & \frac{1}{5} \\ \frac{2}{6} & \frac{4}{6} \end{bmatrix}$$