2-country NK model

$$\beta_i \frac{R_{i,t}}{E_t(\pi_{i,t+1})} = \frac{(C_{i,t}(j) - h_i C_{i,t-1}(j))^{-\sigma_{C_i}} - \beta_i h_i (E_t(C_{i,t+1}(j)) - C_t(j) h_i)^{-\sigma_{C_i}}}{(E_t(C_{i,t+1}(j)) - h_i C_{i,t}(j))^{-\sigma_{C_i}} - \beta_i h_i (E_t(C_{i,t+2}(j)) - E_t(C_{t+1}(j)) h_i)^{-\sigma_{C_i}}} \tag{1}$$

$$\chi_{b_i} (H_{i,t}(j))^{\sigma_{L_i}} = \left((C_{i,t}(j) - h_i C_{i,t-1}(j))^{-\sigma_{C_i}} - \beta_i h_i (E_t(C_{i,t+1}(j)) - C_t(j) h_i)^{-\sigma_{C_i}} \right) w_{i,t} \tag{2}$$

$$q_{i,t} = \frac{1}{a_1} \left(\frac{I_{i,t}}{K_{i,t-1}} \right)^{a_3} \tag{3}$$

$$q_{i,t} \frac{R_{i,t}}{E_t(\pi_{i,t+1})} = \left\{ z_{i,t+1} + E_t q_{t+1} \left(1 - \delta + \frac{a_1}{1 - a_3} \left(\frac{I_{i,t}}{K_{i,t-1}} \right)^{1-a_3} + a_2 - a_1 \left(\frac{I_{i,t}}{K_{i,t-1}} \right)^{1-a_3} \right) \right\} \tag{4}$$

$$E_t \left[\frac{e_{i,t+1}}{e_{i,t}} \right] = \frac{R_{i,t}}{R_{j,t}} (1 + \chi_{b_i} e_{i,t} b^j_{i,t}(j)) \tag{5}$$

$$K_{i,t}(j) = (1 - \delta) K_{i,t-1}(j) + \left(\frac{a_1}{1 - a_3} \left(\frac{I_{i,t}}{K_{i,t-1}} \right)^{1-a_3} + a_2 \right) \cdot K_{i,t-1}(j) \tag{6}$$

$$X_{i,t}(z) = \frac{A_{i,t} K_{i,t-1}(z)^{\alpha} H_{i,t}(z)^{1-\alpha}}{v_{i,t}} \tag{7}$$

$$(1 - \alpha) z_{i,t} K_{i,t-1}(z) = \alpha \; w_{i,t} H_{i,t}(z) \tag{8}$$

$$mc_{i,t}(z) = \frac{1}{A_{i,t}} \left(\frac{z_{i,t}}{\alpha} \right)^{\alpha} \left(\frac{w_{i,t}}{1 - \alpha} \right)^{1-\alpha} \tag{9}$$

$$1 = (1 - \Xi) \left[(\pi^x_{i,t})(\pi^{-1}_{i,t}) \right]^{1-\psi} + (\Xi) \left[(RER_{i,t}) \, (\pi^x_{j,t})(\pi^{-1}_{j,t}) \right]^{1-\psi} \tag{10}$$

$$x_{1,t} = \lambda^c_{i,t} \cdot mc_{i,t} \cdot X_{i,t} + \theta \beta E(\pi_{i,t+1})^{\frac{\mu_{i,t}}{\mu_{i,t} - 1}} \cdot x_{1,t+1} \tag{11}$$

$$x_{2,t} = \lambda^c_{i,t} \cdot X_{i,t} + \theta \beta E(\pi_{i,t+1})^{-\frac{1}{\mu_{i,t} - 1}} \cdot x_{2,t+1} \tag{12}$$

$$\pi^x_{i,t} = \mu_{i,t} \cdot \pi_{i,t} \cdot \frac{x_{1,t}}{x_{2,t}} \tag{13}$$

$$v^P_{i,t} = (1 - \theta)(\pi^x_{i,t})^{-\frac{\mu_{i,t}}{\mu_{i,t} - 1}} (\pi_{i,t})^{\frac{\mu_{i,t}}{\mu_{i,t} - 1}} + (\pi_{i,t})^{\frac{\mu_{i,t}}{\mu_{i,t} - 1}} \cdot \theta \cdot v^P_{i,t-1} \tag{14}$$

$$X_{i,t} = \left[(1 - \Xi) \left[(\pi^x_{i,t})(\pi^{-1}_{i,t}) \right]^{-\psi} \right] \cdot Y_{i,t} \cdot v^P_{i,t} + \left[(\Xi) \left[\frac{1}{RER_{i,t}} (\pi^x_{j,t})(\pi^{-1}_{j,t}) \right]^{-\psi} \right] \cdot Y_{j,t} \cdot v^P_{j,t} \tag{15}$$

$$CA_{i,t} = b^j_{i,t} - b^j_{i,t-1} \tag{16}$$

$$Y_{i,t} = C_{i,t} + I_{i,t} + 0.5 \chi_{b_i} e_{i,t} b^j_{i,t}(j) \tag{17}$$

$$log \left(\frac{R_{i,t}}{R_{i,SS}} \right) = \rho \cdot log \left(\frac{R_{i,t-1}}{R_{i,SS}} \right) + (1 - \rho) \cdot \phi_{\pi} \cdot \; log \left(\frac{\pi_{i,t}}{\pi_{i,SS}} \right) \tag{18}$$

$$\frac{RER_{i,t}}{RER_{i,t-1}} = \frac{\pi_{j,t}}{\pi_{i,t}} \frac{e_{i,t}}{e_{i,t-1}} \tag{19}$$

$$b^f_{h,t} = \frac{e_t}{e_{t-1}} \frac{R_{f,t-1}}{\pi_{i,t}} b^f_{h,t-1} + (\pi^x_{i,t} \cdot \pi^{-1}_{i,t}) \, (X_{i,t} - Y_{i,t}) \tag{20}$$

$$A_{i,t} = (1 - \rho_A) \cdot A_{i,SS} + \rho_A \cdot A_{i,t-1} + \epsilon^A_{i,t} \quad \text{with} \quad \epsilon^A_{i,t} \sim N(0, \sigma^2_A) \tag{21}$$