1. model

$$U_t = \mathrm{E}_t^p \frac{1}{1-q_c}\left((1-f_m)(\mathrm{C}_t)^{1-h_m} + f_m \left(\frac{M_t}{P_t}\right)^{1-h_m} \right)^{\frac{1-q_c}{1-h_m}} exp(\frac{q_c - 1}{1+q_l} L_t^{1+q_l})$$

$$C_t + I_t + \frac{B_t}{\mathrm{E}_t^b R_t P_t} + \frac{M_t}{P_t} + \mathrm{A}\left(m_t\right)\boldsymbol{K}_{t-1} + \boldsymbol{T}_t$$

$$\leq \frac{B_{t-1}}{P_t} + \frac{M_{t-1}}{P_t} + \frac{W_t L_t}{P_t} + \frac{\boldsymbol{R}_t m_t \boldsymbol{K}_{t-1}}{P_t} + \frac{D_t}{P_t}$$

$$\boldsymbol{K}_t = \left(1-d\right)\boldsymbol{K}_{t-1} + \mathrm{E}_t^i \left[1 - \mathrm{S}(\frac{I_t}{I_{t-1}})\right] I_t$$

$$Y_t = A_t K_t^a \left[g^t L_t\right]^{1-a}$$

2 statdy state

$$R = \bar{b}^{-1} p$$

$$\mathrm{R} = \frac{1}{\bar{b}} - \left(1-d\right)$$

$$j_{kl} = \frac{k}{L} = \left(\frac{\mathrm{R}}{a}\right)^{\frac{1}{a-1}}$$

$$w = \mathrm{R}\, j_{kl} a^{-1}(1-a)$$

$$j_{cy} = \frac{c}{y} = 1 - g - (g - (1-d)) j_{kl}^{1-a}$$

$$j_{cL} = \frac{c}{L} = (1-g) j_{kl}^{a} - (g - (1-d)) j_{kl}$$

$$j_{cm} = \left[(1 - \frac{1}{\mathrm{E}_t^b R_t}) \frac{\left(1-f_m\right)}{f_m} \right]^{\frac{1}{h_m}}$$

$$c = \left[\frac{w_t \left(1-f_m\right) j_{cL}^{q_l}}{\left(1-f_m\right) + f_m j_{cm}^{h_m - 1}} \right]^{\frac{1}{1+q_l}}$$

$$L = c j_{cL}^{-1}$$

$$y = c j_{cy}^{-1}$$

$$m = c j_{cm}^{-1}$$

$$k = L j_{kl}$$

$$\mathrm{K} = kg$$

$$i = k(g - (1-d))$$

3 Linearized equation

$$j_1 = \left((1-f_m)(c)^{1-h_m} + f_m (m)^{1-h_m}\right)^{-1} \qquad j_2 = \frac{R f_m h_m}{(1-f_m)}$$

$$-\hat{x}_t = \hat{\mathrm{E}}_t^p + (1-f_m)(h_m - q_c)\ j_1 c^{1-h_m}\hat{c}_t - h_m\hat{c}_t + f_m(h_m - q_c)\ j_1 m^{1-h_m}\hat{m}_t + (q_c - 1)\ L_t^{1+q_l}\hat{L}_t$$

$$\hat{w}_t = j_1(1-h_m)\left((1-f_m)\mathrm{c}^{1-h_m}\ \hat{c}_t + f_m m^{1-h_m}\hat{m}_t\right) + q_l\hat{L}_t + h_m\hat{c}_t$$

$$j_2 j_{cm}^{h_m}(\hat{c}_t - \hat{m}_t) = \hat{\mathrm{E}}_t^b + \hat{R}_t$$

$$\hat{x}_t = \hat{\mathrm{E}}_t^b + \hat{R}_t + \hat{x}_{t+1} - \hat{p}_{t+1}$$

$$\hat{i}_t = (\bar{b}g+1)^{-1}\hat{i}_{t-1} + \bar{b}g(\bar{b}g+1)^{-1}\hat{i}_{t+1} + q_i^{-1}g^{-2}(\bar{b}g+1)^{-1}\hat{Q}_t + \hat{\mathrm{E}}_t^i$$

$$\hat{Q}_t = -\hat{x}_t + \hat{x}_{t+1} + \bar{b}\,\mathrm{R}\,\hat{\mathrm{R}}_{t+1} + \bar{b}\hat{Q}_{t+1}(1-d)$$

$$\hat{\mathrm{K}}_t = (1-d)g^{-1}\hat{\mathrm{K}}_{t-1} + \frac{i}{\mathrm{K}}\hat{\mathrm{E}}_t^i + \frac{i}{\mathrm{K}}\hat{i}_t$$

$$\hat{m}_t = \frac{1-q_m}{q_m}\hat{\mathrm{R}}_t$$

$$\hat{w}_t - \hat{\mathrm{R}}_t = \hat{m}_t + \hat{\mathrm{K}}_{t-1} - \hat{L}_t$$

$$c\hat{c}_t + i\hat{i}_t + yg\hat{g}_t + \mathrm{R}\,\mathrm{K}g^{-1}\hat{m}_t = y\hat{y}_t$$

$$\hat{y}_t = \hat{A}_t + a\hat{m}_t + a\hat{\mathrm{K}}_{t-1} + (1-a)\hat{L}_t$$