Fixed point:

$$Ebond = \beta \sum_{w} (\lambda_t / \lambda_{t+1}) / (g_{t+1} \bar{\pi} \pi_{t+1}^{gap}) \tag{1}$$

$$Ecap = \beta \sum_{w} (\lambda_t / \lambda_{t+1}) (r_{t+1}^{k} + (1-\delta) q_{t+1}) / g_{t+1} \tag{2}$$

$$Einv = \beta \sum_{w} (\lambda_t / \lambda_{t+1}) q_{t+1} (x_{t+1}^{g})^2 (x_{t+1}^{g} - 1) / g_{t+1} \tag{3}$$

$$Eppc = \beta \sum_{w} (\lambda_t / \lambda_{t+1}) (\pi_{t+1}^{gap} - 1) \pi_{t+1}^{gap} (y_{t+1} / y_t) \tag{4}$$

$$x\_up(3) = Ecap \tag{5}$$

$$\lambda_t = 1 / (s_t i_t Ebond / (\bar{\pi} \lambda_t)) \tag{6}$$

$$c_t = \lambda_t + \bar{h} c_t / g_t \tag{7}$$

$$var = (1 - \bar{g} Einv) / x\_up(3) \tag{8}$$

$$x_t^{g} = 1/3\sqrt{7 - 6var} + 2) \tag{9}$$

$$x_t = x_t^{g} \bar{g} x_t / g_t \tag{10}$$

$$y_t = c_t + x_t \tag{11}$$

$$x\_up(2) = (y_t / (k_t / g_t)^{\alpha})^{1/(1-\alpha)} \tag{12}$$

$$RHS = 1 - \theta + \theta mc_t + \varphi Eppc \tag{13}$$

$$x\_up(1) = (1 + \sqrt{(\varphi + 4RHS)/\varphi})/2 \tag{14}$$

$$LHS = \varphi(\pi_{t+1}^{gap} - 1)\pi_{t+1}^{gap} - (1-\theta) - \varphi Eppc \tag{15}$$

$$x\_up(4) = LHS/\theta \tag{16}$$

De-trended Equilibrium System:

$$\tilde{y}_t = (\tilde{k}_{t-1}/g_t)^{\alpha} n_t^{1-\alpha} \tag{1}$$

$$r_t^k = \alpha m c_t g_t \tilde{y}_t / \tilde{k}_{t-1} \tag{2}$$

$$\tilde{w}_t = (1-\alpha) m c_t \tilde{y}_t / n_t \tag{3}$$

$$\tilde{y}_t^{gdp} = [1 - \varphi(\pi_t^{gap} - 1)^2/2]\tilde{y}_t \tag{4}$$

$$y_t^g = g_t \tilde{y}_t^{gdp} / (\bar{g} \tilde{y}_{t-1}^{gdp}) \tag{5}$$

$$i_t^* = (i_{t-1}^*)^{\rho_i} (\bar{\imath}(\pi_t^{gap})^{\phi_\pi} (y_t^g)^{\phi_y})^{1-\rho_i} \exp(\sigma_i \varepsilon_{i,t}) \tag{6}$$

$$i_t = \max\{1, i_t^*\} \tag{7}$$

$$\tilde{\lambda}_t = \tilde{c}_t \ - h\tilde{c}_{t-1}/g_t \tag{8}$$

$$\tilde{w}_t = \chi n_t^{\eta} \tilde{\lambda}_t \tag{9}$$

$$\tilde{c}_t + \tilde{x}_t = \tilde{y}_t^{gdp} \tag{10}$$

$$x_t^g = g_t \tilde{x}_t / (\bar{g} \tilde{x}_{t-1}) \tag{11}$$

$$\tilde{k}_t = (1-\delta)(\tilde{k}_{t-1}/g_t) + \tilde{x}_t(1 - \nu(x_t^g - 1)^2/2) \tag{12}$$

$$1 = \beta E_t[(\tilde{\lambda}_t/\tilde{\lambda}_{t+1})(s_t i_t/(\bar{\pi}\pi_{t+1}^{gap} g_{t+1}))] \tag{13}$$

$$q_t = \beta E_t[(\tilde{\lambda}_t/\tilde{\lambda}_{t+1})(r_{t+1}^k + (1-\delta)q_{t+1})/g_{t+1}] \tag{14}$$

$$1 = q_t[1 - (x_t^g - 1)^2/2 - (x_t^g - 1)x_t^g] + \beta \bar{g} E_t[q_{t+1}(\tilde{\lambda}_t/\tilde{\lambda}_{t+1})(x_{t+1}^g)^2(x_{t+1}^g - 1)/g_{t+1}] \tag{15}$$

$$\varphi(\pi_t^{gap} - 1)\pi_t^{gap} = 1 - \theta + \theta m c_t + \beta \varphi E_t[(\tilde{\lambda}_t/\tilde{\lambda}_{t+1})(\pi_{t+1}^{gap} - 1)\pi_{t+1}^{gap}(\tilde{y}_{t+1}/\tilde{y}_t)] \tag{16}$$

$$g_t = \bar{g} + \sigma_g \varepsilon_{g,t} \tag{17}$$

$$s_t = (1-\rho_s)s_t + \rho_s s_{t-1} + \sigma_s \varepsilon_{s,t} \tag{18}$$

$$mp_t = \sigma_i \varepsilon_{i,t} \tag{19}$$

Variables:$\{\tilde{c}, \tilde{n}, \tilde{x}, \tilde{k}, y^{\tilde{gdp}}, \tilde{y}, x^g, y^g, \tilde{w}, r^k, \pi, i, i^n, q, mc, \tilde{\lambda}, g, s, mp\}$