1、Household

$$\max E_t \sum_{s=t}^{\infty} \beta^{s-t} \left[\frac{C_s^{1-\sigma}}{1-\sigma} - \frac{\xi}{\nu} L_s^{\nu} \right].$$

$$P_t C_t + B_t + M_t = W_t L_t + R_{t-1}^n B_{t-1} + M_{t-1} - T_t$$

$$E_t \left\{ \beta \frac{C_t^{\sigma}}{C_{t+1}^{\sigma} \pi_{t+1}} R_t^n \right\} = 1$$

$$\xi L_t^{\nu-1} = \frac{W_t}{P_t} C_t^{-\sigma}$$

2、Bank

$$R_t^r = \left(\frac{Q_{t-1}^k K_t}{N_{t-1}} \right)^u R_{t-1}^n \frac{P_{t-1}}{P_t}$$

3、Entrepreneur：

$$Y_t = A_t K_t^{\alpha} L_t^{1-\alpha}$$

$$N_t + \frac{B_t}{P_t} = Q_t^k K_{t+1}$$

$$E_t \left\{ R_{t+1}^k \right\} = E_t \left\{ R_t^r \frac{P_t}{P_{t+1}} \right\}$$

$$R_t^k = \frac{\frac{1}{X_t} \frac{\alpha Y_t}{K_t} + (1-\delta) Q_t^k}{Q_{t-1}^k}$$

$$X_t = \frac{P_t}{P_t^{wholesale}}$$

$$N_t = \varphi \left\{ R_t^k Q_{t-1}^k K_t - R_{t-1}^r \frac{P_{t-1}}{P_t} \left(Q_{t-1}^k K_t - N_{t-1} \right) \right\}$$

$$\frac{W_t}{P_t} = (1-\alpha) \frac{Y_t}{X_t L_t}$$

$$K_{t+1} = \Phi\left(\frac{I_t}{K_t} \right) K_t + (1-\delta) K_t = \left[\frac{I_t}{K_t} - \frac{\phi}{2} \left(\frac{I_t}{K_t} - \delta \right)^2 \right] K_t + (1-\delta) K_t$$

$$Q_t^k = \left[\frac{\partial \Phi\left(\frac{I_t}{K_t} \right)}{\partial \left(\frac{I_t}{K_t} \right)} \right]^{-1} = \left[\Phi'\left(\frac{I_t}{K_t} \right) \right]^{-1}$$

4、Retail：

$$Y_t=\left(\int_0^1 Y_t(z)^{\frac{\varepsilon-1}{\varepsilon}}dz\right)^{\frac{\varepsilon}{\varepsilon-1}}\Rightarrow Y_t(z)=\left(\frac{P_t(z)}{P_t}\right)^{-\varepsilon}Y_t$$

$$\frac{P_t}{P_{t-1}}=\left(\mu\frac{P_t^{wholesale}}{P_t}\right)^{\lambda}\left(\frac{P_{t+1}}{P_t}\right)^{\beta}$$

$$\mu=\frac{1}{1-1/\varepsilon},\lambda=\frac{(1-\theta)(1-\theta\beta)}{\theta}$$

5、Goverment：

$$\frac{M_t-M_{t-1}+T_t}{P_t}=G_t$$

$$g_t=\rho_g g_{t-1}+\mu_{gt}$$

$$\mu_{gt}\sim N(0,\sigma_g^2)$$

$$\ln\frac{R_t^n}{R^n}=\rho_\pi\ln\frac{\pi_t}{\pi}+\rho_y\ln\frac{Y_t}{Y}+\varepsilon_{Rt}$$

$$Y_t=C_t+I_t+G_t$$