house p

$$(C_t^p)^{-\sigma} = \lambda_t^p \ \psi(L_t^p)^{\varphi} = \lambda_t^p (1 - au_m^G) W_t^p \ \lambda_t^p = eta_p E_t igg( rac{\lambda_{t+1}^p r_t^b}{\pi_{t+1}} igg) \ q_t^p = eta_p E_t igg( rac{\lambda_{t+1}^p r_t^b}{\pi_{t+1}} igg) \ q_t^p = eta_p E_t igg( rac{\lambda_{t+1}^p}{\lambda_t^p} igg[ r_{t+1}^k + (1 - \delta_k) q_{t+1}^p igg] igg) \ 1 = q_t^p igg[ 1 - rac{\Omega}{2} igg( rac{i_t^p}{i_{t-1}^p} - 1 igg)^2 - \Omega igg( rac{i_t^p}{i_{t-1}^p} igg) igg( rac{i_t^p}{i_{t-1}^p} - 1 igg) igg] + \Omega eta_p E_t igg\{ q_{t+1}^p rac{\lambda_{t+1}^p}{\lambda_t^p} igg[ igg( rac{i_{t+1}^p}{i_t^p} igg)^2 igg( rac{i_{t+1}^p}{i_t^p} - 1 igg) igg] igg\} \ K_t^p = (1 - \delta_k) K_{t-1}^p + igg[ 1 - rac{\Omega}{2} igg( rac{i_t^p}{i_{t-1}^p} - 1 igg)^2 igg] i_t^p \ C_t^p + i_t^p + d_t^p = r_t^k K_{t-1}^p + rac{r_{t-1}^b}{\pi_t} d_{t-1}^p + (1 - au_m^G) W_t^p L_t^p + T_{G,t} \ \end{pmatrix}$$

house e

$$\begin{split} (C_t^e)^{-\sigma} &= \lambda_t^e \\ \psi(L_t^e)^{\varphi} &= \lambda_t^e (1 - \tau_m^G) W_t^e \\ \lambda_t^e &= \beta_e E_t \bigg( \frac{\lambda_{t+1}^e r_t^b}{\pi_{t+1}} \bigg) \\ q_t^e &= \beta_e E_t \bigg\{ \frac{\lambda_{t+1}^e}{\lambda_t^e} \big[ r_{t+1}^k + (1 - \delta_k) q_{t+1}^e \big] \Big\} \\ 1 &= q_t^e \bigg[ 1 - \frac{\Omega}{2} \bigg( \frac{i_t^e}{i_{t-1}^e} - 1 \bigg)^2 - \Omega \bigg( \frac{i_t^e}{i_{t-1}^e} \bigg) \bigg( \frac{i_t^e}{i_{t-1}^e} - 1 \bigg) \bigg] + \Omega \beta_e E_t \bigg\{ q_{t+1}^e \frac{\lambda_{t+1}^e}{\lambda_t^e} \bigg[ \bigg( \frac{i_{t+1}^e}{i_t^e} \bigg)^2 \bigg( \frac{i_{t+1}^e}{i_t^e} - 1 \bigg) \bigg] \bigg\} \bigg\} \\ K_t^e &= (1 - \delta_k) K_{t-1}^e + \bigg[ 1 - \frac{\Omega}{2} \bigg( \frac{i_t^e}{i_{t-1}^e} - 1 \bigg)^2 \bigg] i_t^e \\ C_t^e + i_t^e + d_t^e = r_t^k K_{t-1}^e + \frac{r_{t-1}^b}{\pi_t} d_{t-1}^e + (1 - \tau_m^G) W_t^e L_t^e \end{split}$$

government

$$g_t + rac{r_{t-1}^b}{\pi_t} d_t + au_{D,t}^{\scriptscriptstyle R} S_t + T_{\scriptscriptstyle G,t} \! = \! d_t + au_{\scriptscriptstyle m}^{\scriptscriptstyle G} (W_t^{\scriptscriptstyle P} L_t^{\scriptscriptstyle p} + W_t^{\scriptscriptstyle e} L_t^{\scriptscriptstyle e})$$

central bank

$$egin{split} rac{r_t^b}{r^b} = & \left(rac{r_{t-1}^b}{r^b}
ight)^{
ho_r} igg[\left(rac{\pi_t}{\pi}
ight)^{arPhi_\pi} \left(rac{Y_t}{Y}
ight)^{arPhi_\gamma}igg]^{1-
ho_r} e^{arepsilon_t^m} \end{split}$$

medi<mark>um goo</mark>ds

$$egin{aligned} r_t^k &= eta_0 \, (1-\gamma) \, m c_t \, rac{Y_t}{K_{t-1}} \ W_t^p &= (1-eta_0) \, (1-\gamma) \, m c_t \, rac{Y_t}{L_{pf,t}} \ W_t^e &= (1-eta_1) \, \gamma m c_t \, rac{Y_t}{L_{ef,t}} \ \pi_t (\pi_t - \pi) &= eta_p E_t igg[ rac{\lambda_{t+1}^p}{\lambda_t^p} \pi_{t+1} (\pi_{t+1} - \pi) \, rac{Y_{t+1}}{Y_t} igg] + rac{arepsilon}{ heta} igg( m c_t - rac{arepsilon - 1}{arepsilon} igg) \ Y_t &= C_t + i_t + g_t + (1 + au_{D,t}^R) S_t + rac{ heta}{2} (\pi_t - \pi)^2 Y_t \ Y_t &= igg[ (K_t)^{eta_0} (L_{pf,t})^{1-eta_0} igg]^{1-\gamma} igg[ (D_t)^{eta_1} (L_{pf,t})^{1-eta_1} igg]^{\gamma} \ C_t &= C_t^p + C_t^e \ K_t &= K_t^p + K_t^e \ i_t &= i_t^p + i_t^e \ dt &= d_t^p + d_t^e \ L_t &= L_t^p + L_t^e \ L_t^p &= L_{pf,t} \ L_t^p &= L_{pf,t} \ L_t^p &= L_{pf,t} \ \end{array}$$

research

$$\begin{split} D_{V,t} &= \chi_t^Y Y_t \\ D_{G,t} &= \chi_t^C C_t \\ N_t^D &= \omega_D \big[ (1 + \tau_{D,t}^R) S_t \big]^{\alpha} (L_{D,t}^e)^{1-\alpha} + (1 - \delta_D) N_{t-1}^D \\ B_t &= D_{G,t}^{\nu} (N_t^D)^{1-\nu} \\ D_t &= \xi D_{V,t} + (1 - \xi) B_t \\ S_t + W_t^e L_{D,t}^e &= Y_t \bigg[ 1 - (1 - \beta_1 \gamma) m c_t - \frac{\theta}{2} \left( \pi_t - \pi \right)^2 \bigg] \\ W_t^e &= \omega_D (1 - \alpha)^2 \frac{Y_t \bigg[ 1 - (1 - \beta_1 \gamma) m c_t - \frac{\theta}{2} \left( \pi_t - \pi \right)^2 \bigg]}{D_t} \bigg( \frac{D_{G,t}}{N_t^D} \bigg)^{\nu} \bigg[ \frac{(1 + \tau_{D,t}^R) S_t}{L_{D,t}^e} \bigg]^{\alpha} \end{split}$$

s<mark>hock</mark>s

$$egin{align} \log\left(T_{G,t}
ight) = & (1-
ho_{TG})\log\left(\overline{T_G}
ight) + 
ho_{TG}\log\left(T_{G,t-1}
ight) + arepsilon_t^{T_G} \ & arepsilon_t^{T_G} \sim N\left(0\,,\sigma_{T_G}^{\,2}
ight) \end{aligned}$$

$$egin{aligned} \log(\chi_t^Y) \!=\! (1\!-\!
ho_{\chi^{\scriptscriptstyle Y}}) \!\log\!\left(\overline{\chi^{\scriptscriptstyle Y}}
ight) \!+\! 
ho_{\chi^{\scriptscriptstyle Y}} \!\log(\chi_{t-1}^Y) \!+\! arepsilon_t^{\chi^{\scriptscriptstyle Y}} \ & arepsilon_t^{\chi^{\scriptscriptstyle Y}} \sim \! N(0,\!\sigma_{\chi^{\scriptscriptstyle Y}}^{2_{\scriptscriptstyle Y}}) \end{aligned}$$

$$egin{align} \log(\chi_t^{\scriptscriptstyle C}) \!=\! (1\!-\!
ho_{\chi^{\scriptscriptstyle C}}) \!\log\!\left(\overline{\chi^{\scriptscriptstyle C}}
ight) \!+\! 
ho_{\chi^{\scriptscriptstyle C}} \!\log(\chi_{t-1}^{\scriptscriptstyle C}) \!+\! arepsilon_t^{\chi^{\scriptscriptstyle C}} \ & arepsilon_t^{\chi^{\scriptscriptstyle C}} \sim \! N(0,\!\sigma_{\chi^{\scriptscriptstyle C}}^{\scriptscriptstyle 2}) \end{aligned}$$

$$egin{aligned} \log\left(g_{t}
ight) &= (1-
ho_{g})\log\left(ar{g}
ight) + 
ho_{g}\log\left(g_{t-1}
ight) + arepsilon_{t}^{g} \ &arepsilon_{t} N\left(0\,, \sigma_{g}^{2}
ight) \end{aligned}$$

$$arepsilon_t^m \sim N(0,\sigma_m^2)$$