New-Keynesian Model

School of Economics, University College Dublin

Spring 2017

$$Y_t = \left(\int_0^1 Y_t(i)^{\frac{\theta-1}{\theta}} di\right)^{\frac{\theta}{\theta-1}}$$

$$Y_t(i) = Y_t \left(\frac{P_t(i)}{P_t}\right)^{-\theta}$$

$$P_t = \left(\int_o^1 P_t(i)^{1-\theta} di\right)^{\frac{1}{1-\theta}}$$

$$X = \frac{\theta}{\theta - 1}\frac{E_t\left(\sum_{k=0}^{\infty}(\alpha\beta)^k Y_{t+k} Pt + k^{\theta-1} MC_{t+k}\right)}{E_t\left(\sum_{k=0}^{\infty}(\alpha\beta)^k Y_{t+k} Pt + k^{\theta-1}\right)}$$

$$P_t^{1-\theta} = (1-\alpha)X_t^{1-\theta} + \alpha P_{t-1}^{1-\theta}$$

$$X = \frac{\theta}{\theta - 1}\frac{E_t\left(\sum_{k=0}^{\infty}(\alpha\beta)^k Y_{t+k} Pt + k^{\theta-1} MC_{t+k}\right)}{E_t\left(\sum_{k=0}^{\infty}(\alpha\beta)^k Y_{t+k} Pt + k^{\theta-1}\right)}$$

$$\sum_{k=0}^{\infty} \frac{E_t C_{t+k}}{\left(\prod_{m=1}^{k+t} R_{t+m}\right)} = A_t + \sum_{k=0}^{\infty} \frac{E_t Y_{t+k}}{\left(\prod_{m=1}^{k+t} R_{t+m}\right)}$$

$$L = \sum_{k=0}^{\infty} \left(\frac{1}{1+\beta}\right)^k U(C_{t+k}) +$$

$$\lambda \left[A_t + \sum_{k=0}^{\infty} \frac{E_t Y_{t+k}}{\left(\prod_{m=1}^{k+1}\right)} - \sum_{k=0}^{\infty} \frac{E_t C_{t+k}}{\left(\prod_{m=1}^{k+1} R_{t+m}\right)}\right]$$

$$A = \frac{1}{1+\sigma\phi_x+\kappa\sigma\phi_\psi}\begin{pmatrix}1 & \sigma(1-\beta\phi_\psi) \\ \kappa & \beta+\sigma\kappa+\beta(1+\sigma\phi_x)\end{pmatrix}$$

$$B = \frac{1}{1+\sigma\phi_x+\kappa\sigma\phi_\psi}\begin{pmatrix}1 & -\sigma\phi_\psi \\ \kappa & 1+\sigma\phi_x\end{pmatrix}$$