1)

$$\frac{1-\phi}{\phi}\frac{C_t}{L_t} = (1-\alpha)\frac{y_t}{n_t}$$

$$E_{t-1}\left[\beta \frac{U(C_t, L_t)}{C_t}\left(\alpha \frac{y_t}{k_t} + 1 - \delta\right)\right] = \frac{u(C_{t-1}, L_{t-1})}{C_{t-1}}$$

$$y_t = z_t k_t^{\alpha} n_t^{1-\alpha}$$

$$1 = n_t + L_t$$

$$y_t = c_t + i_t$$

$$k_t = i_{t-1} + (1-\delta) k_{t-1}$$

$$u(c, l) = \frac{(c^{\phi} l^{1-\phi})^{1-\psi}}{1-\psi}$$

$$\ln z_t = (1-\rho)\ln \bar{z} + \rho \ln z_{t-1} + e_t$$

$$\frac{\bar{y}}{\bar{n}} = \eta \qquad \frac{\bar{c}}{\bar{n}} = \eta - \delta\theta \qquad \frac{\bar{i}}{\bar{n}} = \delta\theta$$

$$\bar{n} = \frac{1}{1 + \left(\frac{1}{1-\alpha}\right)\left(\frac{1-\phi}{\phi}\right)\left[1 - \delta\theta^{1-\alpha}\right]}$$

$$\bar{l} = 1 - \bar{n}.$$

$$\frac{\bar{k}}{\bar{n}} = \theta$$

$$\theta = \left(\frac{\alpha}{1/\beta - 1 + \delta}\right)^{1/1-\alpha}$$

$$\eta = \theta^{\alpha}$$

$$z_t = z_0 (1+g)^t e^{w_t}$$

$$w_t = \rho w_{t-1} + \varepsilon_t$$

$$\left(1 + \frac{g}{1-\alpha}\right) k_{t+1} = i_t + (1-\delta) k_t$$

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$$K = \phi(1-\phi) - 1$$

Residual factor is given by $\left(1+\frac{g}{1-\alpha}\right)^k$:

$$c_t^k l_t^\lambda = \beta E_t \left\{ \left(1+\frac{g}{1-\alpha}\right)^k c_{t+1}^k l_{t+1}^\lambda \left[\alpha z_{t+1} \left(\frac{n_{t+1}}{k_{t+1}}\right)^{1-\alpha} + (1-\delta)\right] \right\}$$

$$A x_{t+1} = B x_t + C v_{t+1} + D \eta_{t+1}$$

$$0 = \log\left(\frac{1-\phi}{\phi}\right) + \log c' - \log l' - \log(1-\alpha) - \log z'$$
$$- \alpha \log k + \alpha \log n'$$

$$0 = k \log c + \lambda \log t - \log \beta - k \log c' - \lambda \log l'$$
$$- \log \left[\alpha \exp(\log z') \frac{\exp[(1-\alpha)\log n']}{\exp[(1-\lambda)\log k']} + (1-\delta)\right]$$

$$0 = \log y' - \log z' - \alpha \log k - (1-\alpha) \log n'$$

$$0 = \log y' - \log [\exp[\log(c')]] + \exp[\log(i')]]$$

$$0 = \log k' - \log\{\exp[\log(i')] + (1-\delta)\exp[\log(k)]]$$

$$0 = -\log[\exp[\log(n')] + \exp[\log(l')]]\}$$

$$0 = \log z' - \rho \log z.$$

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