RBC model with the Epstein-Zin preferences

The model is given by

$$U_t = \max \left[(1-\beta)(c_t^{\nu}(1-l_t)^{1-\nu})^{\frac{1-\gamma}{\theta}} + \beta \left(E_t U_{t+1}^{1-\gamma} \right)^{\frac{1}{\theta}} \right]^{\frac{\theta}{1-\gamma}}, \quad \theta = \frac{1-\gamma}{1-\frac{1}{\psi}}$$

subject to

$$\begin{aligned} c_t + k_{t+1} &= e^{z_t} k_t^{\zeta} l_t^{1-\zeta} + (1-\delta) k_t \\ z_t &= \lambda z_{t-1} + \sigma \varepsilon_t, \quad \varepsilon_t \ \tilde{} \ iid \ N(0,1). \end{aligned}$$

Then optimality conditions are as follows

$$\begin{aligned} V_t - \left[(1-\beta)(c_t^{\nu}(1-l_t)^{1-\nu})^{\frac{1-\gamma}{\theta}} + \beta \left(E_t V^{1-\gamma}(k_{t+1}, z_{t+1}) \right)^{\frac{1}{\theta}} \right]^{\frac{\theta}{1-\gamma}} &= 0 \\ E_t \left[\beta \left(\frac{c_{t+1}}{c_t} \right)^{\frac{1-\gamma}{\theta}-1} \left(\frac{V_{t+1}^{1-\gamma}}{E_t V_{t+1}^{1-\gamma}} \right)^{1-\frac{1}{\theta}} \left(\zeta e^{z_{t+1}} k_{t+1}^{\zeta} l_{t+1}^{\zeta} + 1 - \delta \right) \right] - 1 &= 0 \\ \frac{1-\nu}{\nu} \frac{c_t}{1-l_t} - (1-\zeta) e^{z_t} k_t^{\zeta} l_t^{-\zeta} &= 0 \\ E_t \beta \left(\frac{c_{t+1}}{c_t} \right)^{\frac{1-\gamma}{\theta}-1} \left(\frac{V_{t+1}^{1-\gamma}}{E_t V_{t+1}^{1-\gamma}} \right)^{1-\frac{1}{\theta}} R_t^f - 1 &= 0 \\ c_t + i_t - e^{z_t} k_t^{\zeta} l_t^{1-\zeta} &= 0 \\ k_{t+1} - i_t - (1-\delta) k_t &= 0. \end{aligned}$$