$$a_{t+1} = a_0 + \beta a_t + \epsilon_{t+1}$$

$$E_t[a_{t+1}|a_t] = E_t[a_0 + \beta a_t + \epsilon_{t+1}] = a_0 + \beta a_t + E_t[\epsilon_{t+1}] = a_0 + \beta a_t$$

$$Var(a_t) = \frac{\sigma_\epsilon^2}{1-\beta^2}$$

$$E[a_{t+1}] = \frac{a_0}{1-\beta}$$

$$Var(a_t) = a_0$$

$$S_t = [a_t \ \tau_{lt} \ \tau_{xt} \ g_t]'$$

$$S_{t+1} = S_0 + PS_t + \epsilon_t$$

$$\begin{aligned}
a_{t+1} &= s_1 + p_{11}a_t + p_{12}\tau_{lt} + p_{13}\tau_{xt} + p_{14}g_t + \epsilon_{1,t+1} \\
\tau_{l,t+1} &= s_2 + p_{21}a_t + p_{22}\tau_{lt} + p_{23}\tau_{xt} + p_{24}g_t + \epsilon_{2,t+1} \\
\tau_{x,t+1} &= s_3 + p_{31}a_t + p_{32}\tau_{lt} + p_{33}\tau_{xt} + p_{34}g_t + \epsilon_{3,t+1} \\
g_{t+1} &= s_4 + p_{41}a_t + p_{42}\tau_{lt} + p_{43}\tau_{xt} + p_{44}g_t + \epsilon_{4,t+1}
\end{aligned}$$

$$P = \begin{matrix} p_{11} & p_{12} & p_{13} & p_{14} \\ p_{21} & p_{22} & p_{23} & p_{24} \\ p_{31} & p_{32} & p_{33} & p_{34} \\ p_{41} & p_{42} & p_{43} & p_{44} \end{matrix}; S_0 = \begin{matrix} s_1 \\ s_2 \\ s_3 \\ s_4 \end{matrix}; \epsilon_t = \begin{matrix} \epsilon_1 \\ \epsilon_2 \\ \epsilon_3 \\ \epsilon_4 \end{matrix}$$

$$z_{t+1} = z_t + \epsilon_{t+1}$$

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