Dynamic Macroeconomics with Numerics: Project II

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One-Sector Stochastic Growth Model

Notes on optimality conditions

We have the technology given by

$$z_{t+1} = \exp(x_{t+1}) = \exp(\rho x_t + \epsilon_{t+1})$$
$$z_t = \exp(x_t) = \exp(\rho x_{t-1} + \epsilon_t).$$

We can solve the latter one for ρ:

$$\log z_t - \epsilon_t = \rho x_{t-1} \Leftrightarrow \rho = \frac{\log z_t - \epsilon_t}{x_{t-1}},$$

which we can plug into z_{t+1}

$$z_{t+1} = \exp\left(\frac{x_t}{x_{t-1}}(\log z_t - \epsilon_t) + \epsilon_{t+1}\right)$$