

#1

$$m_t - p_t = \gamma + \alpha (E_t p_{t+1} - p_t)$$

$$m_t = \mu^* + \varepsilon_t + \varepsilon_{t-1}$$

$$\mu^* + \varepsilon_t + \varepsilon_{t-1} = \gamma + \alpha E_t p_{t+1} + (1 - \alpha) p_t$$

Conjecture a solution:

$$p_t = \phi_0 + \phi_1 \varepsilon_t + \phi_2 \varepsilon_{t-1}$$

$$p_{t+1} = \phi_0 + \phi_1 \varepsilon_{t+1} + \phi_2 \varepsilon_t$$

$$E_t p_{t+1} = \phi_0 + \phi_2 \varepsilon_t$$

Substitute:

$$\begin{aligned} \mu^* + \varepsilon_t + \varepsilon_{t-1} = & \gamma + \alpha (\phi_0 + \phi_2 \varepsilon_t) \\ & + (1 - \alpha) (\phi_0 + \phi_1 \varepsilon_t + \phi_2 \varepsilon_{t-1}) \end{aligned}$$

(2)

Equate coefficients:

$$\textcircled{1} \quad \mu^* = \gamma + \alpha \phi_0 + (1-\alpha) \phi_0 \quad (\text{Constant})$$

$$\textcircled{2} \quad 1 = \alpha \phi_2 + (1-\alpha) \phi_1 \quad (\varepsilon_t)$$

$$\textcircled{3} \quad 1 = (1-\alpha) \phi_2 \quad (\varepsilon_{t-1})$$

Solve:

$$\textcircled{3} \Rightarrow \frac{1}{1-\alpha} = \phi_2$$

$$\boxed{\phi_2 = \frac{1}{1-\alpha}}$$

$$\textcircled{2} \Rightarrow 1 = \alpha \phi_2 + (1-\alpha) \phi_1$$

$$1 = \alpha \left(\frac{1}{1-\alpha} \right) + (1-\alpha) \phi_1$$

$$1 - \alpha = \alpha + (1-\alpha)^2 \phi_1$$

$$1 - 2\alpha = (1-\alpha)^2 \phi_1$$

$$\frac{1-2\alpha}{(1-\alpha)^2} = \phi_1$$

$$\phi_1 = \frac{1-2\alpha}{(1-\alpha)^2}$$

3

$$\textcircled{1} \Rightarrow \mu^* = \gamma + \alpha \phi_0 + (1-\alpha) \phi_0$$

$$\mu^* = \gamma + \phi_0$$

$$\phi_0 = \mu^* - \gamma$$