

Write an AR(1) with $|p| < 1$ as infinite MA

$$Y_t = p Y_{t-1} + \sum_{h=0}^{\infty} p^h \epsilon_{t-h} \quad Y_t = \sum_{h=0}^{\infty} p^h \epsilon_{t-h}$$

Write an MA(1) with $|\theta| < 1$ as infinite AR

$$Y_t = \epsilon_t + \theta \epsilon_{t-1} \quad \epsilon_t = Y_t - \theta \epsilon_{t-1}$$

$$\epsilon_{t-1} = Y_{t-1} - \theta \epsilon_{t-2}$$

$$Y_t = \epsilon_t + \sum_{h=1}^{\infty} -1^{(h-1)} \theta^h Y_{t-h}$$

$$p_h = -1^{(h-1)} \theta^h$$

$$|\theta| < 1 \quad |\theta|^h \rightarrow 0$$

$$Y_t = \sum_{h=1}^{\infty} p_h Y_{t-h} + \epsilon_t$$

$$AR(\infty)$$