

ARDL(2,2)

$$(1 - \theta_1 L - \theta_2 L^2) y_t = \delta + (\delta_0 + \delta_1 L + \delta_2 L^2) x_t + v_t$$

$$y_t = (1 - \theta_1 L - \theta_2 L^2)^{-1} \delta + (1 - \theta_1 L - \theta_2 L^2)^{-1} (\delta_0 + \delta_1 L + \delta_2 L^2) x_t + (1 - \theta_1 L - \theta_2 L^2)^{-1} (\beta_0 + \beta_1 L + \beta_2 L^2 + \dots) e_t$$

Mult both sides.  $(1 - \theta_1 L - \theta_2 L^2)$

$$\begin{aligned} & (\beta_0 + \beta_1 L + \beta_2 L^2 + \dots) \\ & - \beta_0 \theta_1 L - \beta_1 \theta_1 L^2 - \beta_2 \theta_1 L^3 \\ & \quad - \beta_0 \theta_2 L^2 - \beta_1 \theta_2 L^3 - \beta_2 \theta_2 L^4 \end{aligned}$$

$$\begin{aligned} = & \beta_0 + (\beta_1 - \beta_0 \theta_1) L + (\beta_2 - \beta_1 \theta_1 - \beta_0 \theta_2) L^2 \\ & + (\beta_3 - \beta_2 \theta_1 - \beta_1 \theta_2) L^3 + \dots \end{aligned}$$

$$\alpha_0 = \beta_0$$

$$\alpha_1 = \beta_1 - \beta_0 \theta_1 \quad \beta_1 = \alpha_1 + \alpha_0 \theta_1$$

$$\alpha_2 = \beta_2 - \beta_1 \theta_1 - \beta_0 \theta_2 \quad \beta_2 = \alpha_2 + \alpha_1 \theta_1 + \alpha_0 \theta_2$$

$$\alpha_3 = 0 \quad \beta_3 = \alpha_2 \theta_1 + \alpha_1 \theta_2$$

$$\beta_4 = \alpha_3 \theta_1 + \alpha_2 \theta_2$$

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