

$$(1) \quad C_t = \alpha_0 + d_1 Y_t^e + d_2 X_t + u_t$$

$$Y_t^e = \lambda Y_t + \lambda^2 Y_{t-1} + \lambda^3 Y_{t-2} + \dots$$

$$\lambda Y_{t-1}^e = \lambda^2 Y_{t-1} + \lambda^3 Y_{t-2} + \lambda^4 Y_{t-3} + \dots$$

$$(2) \quad \lambda C_t = \lambda \alpha_0 + \lambda d_1 Y_{t-1}^e + \lambda d_2 X_t + \lambda u_t$$

$$(1) - (2) \quad C_t - \lambda C_{t-1} = (1-\lambda)\alpha_0 + d_1 (Y_t^e - \lambda Y_{t-1}^e) \\ + d_2 (X_t - \lambda X_{t-1}) + u_t - \lambda u_{t-1}$$

$$C_t = \lambda C_{t-1} + (1-\lambda)\alpha_0 + d_1 \lambda Y_t^e + d_2 (X_t - \lambda X_{t-1}) \\ + u_t - \lambda u_{t-1}$$