

12.1 Wold Representation Theorem

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Any Covariance stationary process y_t can be written (exactly)
as $y_t = \gamma_t + \sum_{n=0}^{\infty} \theta_n \varepsilon_{t-n}$ where $\theta_0 = 1$
 $\varepsilon_t \sim (0, \sigma^2)$
 γ_t is completely deterministic
 $\sum_{n=0}^{\infty} \theta_n^2 < \infty$

→ can be written $y_t = \gamma_t + \sum_{n=1}^{\infty} \rho_n y_{t-n} + \varepsilon_t$
 \downarrow
 x_0

if $|\rho| < 1$, finite p is good enough

$$y_t = x_0 \beta + \sum_{n=1}^p \rho_n y_{t-n} + \varepsilon_t$$

Auto-regressive distributed lag model