Actividad 6 Estadística Aplicada GPO 51

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1. a) $E(Y_t) = E(\varepsilon_t) = 0$

b) $Var(Y_t) = E(Y_t - \mu_{Y_t})^2$

$= E(\varepsilon_t - 0)^2$

$= E(\varepsilon_t^2)$

$= \sigma^2_\varepsilon$

c) $Cov(Y_t, Y_{t+k}) = E(Y_t - \mu_{Y_t})(Y_{t+k} - \mu_{Y_{t+k}})$

$= \cancel{E(\varepsilon_t)}^{0} (\sum \varepsilon_{t+k})$

$= 0$

d) El proceso no tiene memoria, no cuenta con medio, varianza constante $\Rightarrow$ es proceso no estacionario.

2. a) converge exponencialmente a cero ya que converge solamente si su varianza lo hace, por sus variables aleatorias en el tiempo $t, t-1, t-2, \ldots$

b) $Media = E(Y_t) = E(\rho_1 Y_{t-1} + \rho_2 Y_{t-2} + \varepsilon_t)$

$= \rho_1 E(Y_{t-1}) + \rho_2 E(Y_{t-2}) \cancel{E(\varepsilon_t)}$

$= \rho_1 Y_{t-1} + \rho_2 Y_{t-2}$

c) $Var(Y_t) = Y_0 = \dfrac{(1-\rho_2)\sigma_0^2}{(1+\rho_2)[(1-\rho_2)^2 - \rho_1^2)]}$

$Y_1 = \dfrac{\rho_1 Y_0}{1-\rho_2}$

$Y_2 = \dfrac{\rho_2(1-\rho_2) + \rho_1^2}{1-\rho_2} Y_0$

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d) $Cov(Y_t, Y_{t-1}) = E(Y_t - \mu)(Y_{t-1} - \mu)$

$= E(\rho_1 Y_{t-1})$

$= \rho_1 Y_1 + \rho_2 Y_2$

e) $Cov(Y_t, Y_{t+1}) = E(Y_t - \mu)(Y_{t+1} - \mu)$

$= \rho_1 Y_0 + \rho_2 Y_1$

F) $\rho_1 = \frac{Cov(Y_t, Y_{t-1})}{Var(Y_t)}$

$= \frac{E(Y_t, Y_{t-1})}{E(Y_1)^2}$

$= \frac{\rho_1 Y_1 + \rho_2 Y_0}{Y_0}$

$= \rho_1 + \rho_2$

3. a) $E(Y_t) = E(\theta_1 \varepsilon_{t-1} + \theta_2 \varepsilon_{t-2} + \varepsilon_t) = 0$

b) $Var(Y_t) = E(Y_t - \mu)$

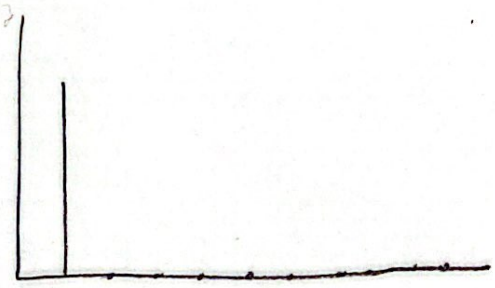
$= \theta_1 E(\varepsilon_{t-1}) + \theta_2 E(\varepsilon_{t-2}) + E(\varepsilon_t)$

$= \theta_1 \sigma_\varepsilon^2 + \theta_2 \sigma_\varepsilon^2$

c) $Cov(Y_t, Y_{t-k}) = (1 + \theta_1^2 + \theta_2^2)\sigma_{\varepsilon_t}^2$

d) $\rho_k = 0 \quad \forall k > 2$

e) grafica autocorrelación proceso $\rho_1 \dots \rho_{10}$



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