НА_2_ Эйсуков Григорий

$y_t = 1.2y_{t-1} - 0.2y_{t-2} + u_t$, $AR(2)$, $u_t \sim N(0, \sigma^2)$

Решение:

1) $\mu = E(1.2y_{t-1} - 0.2y_{t-2} + u_t) = 1.2E(y_{t-1}) - 0.2E(y_{t-2})$

$\mu = 1.2\mu - 0.2\mu$

$\mu = \mu$

$\hat{y}_{t+1} = E(y_{t+1}|y_t, y_{t-1}) = \underline{1}.2y_t - 0.2y_{t-1} + u_{t+1}$

$\hat{y}_{t+2} = E(y_{t+2}|y_t, y_{t-1}) = 1.2y_{t+1} - 0.2y_t^{\vee} =$ $+u_{t+2}$

$= \underline{1}.2(1.2y_t - 0.2y_{t-1}^{\vee}) - 0.2y_t = 1.44y_t - 0.24y_{t-1} + 1.2u_{t+1}$ $+u_{t+1}$

$-0.2(\cancel{1.2}y_t + u_{t+2} = \underline{1}.24y_t - 0.24y_{t-1} + \underline{1}.2u_{t+1} - 0.2u_{t+2}$

$\hat{y}_{t+3} = 1.2 \cdot y_{t+2} - 0.2y_{t+1} + u_{t+3} =$

$= 1.2 \cdot (1.24y_t - 0.24y_{t-1} + 1.2u_{t+1} - 0.2u_{t+2}) - 0.2y_{t+1} + u_{t+3}$

$= 1,488y_t - 0.288y_{t-1} - 0.2y_{t+1} +$, $E(u_i) = 0$.

$+1.24u_{t+1} - 0.24u_{t+2} + u_{t+3}$

2) $Var(\hat{y}_{t+1}) = Var(u_{t+1}) = \sigma^2$

$Var(\hat{y}_{t+2}) = 1.44\sigma^2 + \sigma^2 = 2.44\sigma^2$

$Var(\hat{y}_{t+3}) = 1.24^2\sigma^2 + 1.44\sigma^2 + \sigma^2 = 3.9776\sigma^2$

3) $0.2x^2 - \underline{1}.2x + \underline{1} = 0$

$\cancel{D} = \underline{1}.44 - 0.8 = 0.8^2$

$x_1 = \frac{2}{0.4} = 5$

$x_2 = \underline{1}$ - не уд. $\Rightarrow$ процесс не явл. стац.