

ID5

MA

Identification



5.5 EXAMPLE 5.2

The process considered in [Example 5.1](#) will be now modeled using inverse Yule–Walkers equations. To this purpose we will identify, as first step an auxiliary AR model with order 12 that, as already seen, is fully validated by the whiteness test on its residuals; taking $N = 1020$ and using least squares we obtain the following estimates

$$\begin{array}{lll} \alpha_1 = -0.0790 & \alpha_5 = -0.5569 & \alpha_9 = -1.0275 \\ \alpha_2 = 0.1458 & \alpha_6 = 0.6631 & \alpha_{10} = 1.1115 \\ \alpha_3 = -0.2858 & \alpha_7 = -0.7867 & \alpha_{11} = -1.2096 \\ \alpha_4 = 0.3787 & \alpha_8 = 0.9208 & \alpha_{12} = 1.0046. \end{array}$$

The corresponding inverse covariances ρ_i needed in equation [\(5.4.6\)](#) for $n = 3$ are, according to [\(5.4.5\)](#),

$$\begin{array}{ll} \hat{\rho}_0 = 8.2328 & \hat{\rho}_3 = -5.9247 \\ \hat{\rho}_1 = -7.6401 & \hat{\rho}_4 = 4.9277 \\ \hat{\rho}_2 = 6.9377 & \hat{\rho}_5 = -3.9516 ; \end{array}$$

the model parameters obtained with [\(5.4.6\)](#) are

$$\begin{array}{l} \alpha_1 = -0.2742 \text{ } (-0.28) \\ \alpha_2 = -0.0851 \text{ } (-0.19) \\ \alpha_3 = 1.0857 \text{ } (1). \end{array}$$

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